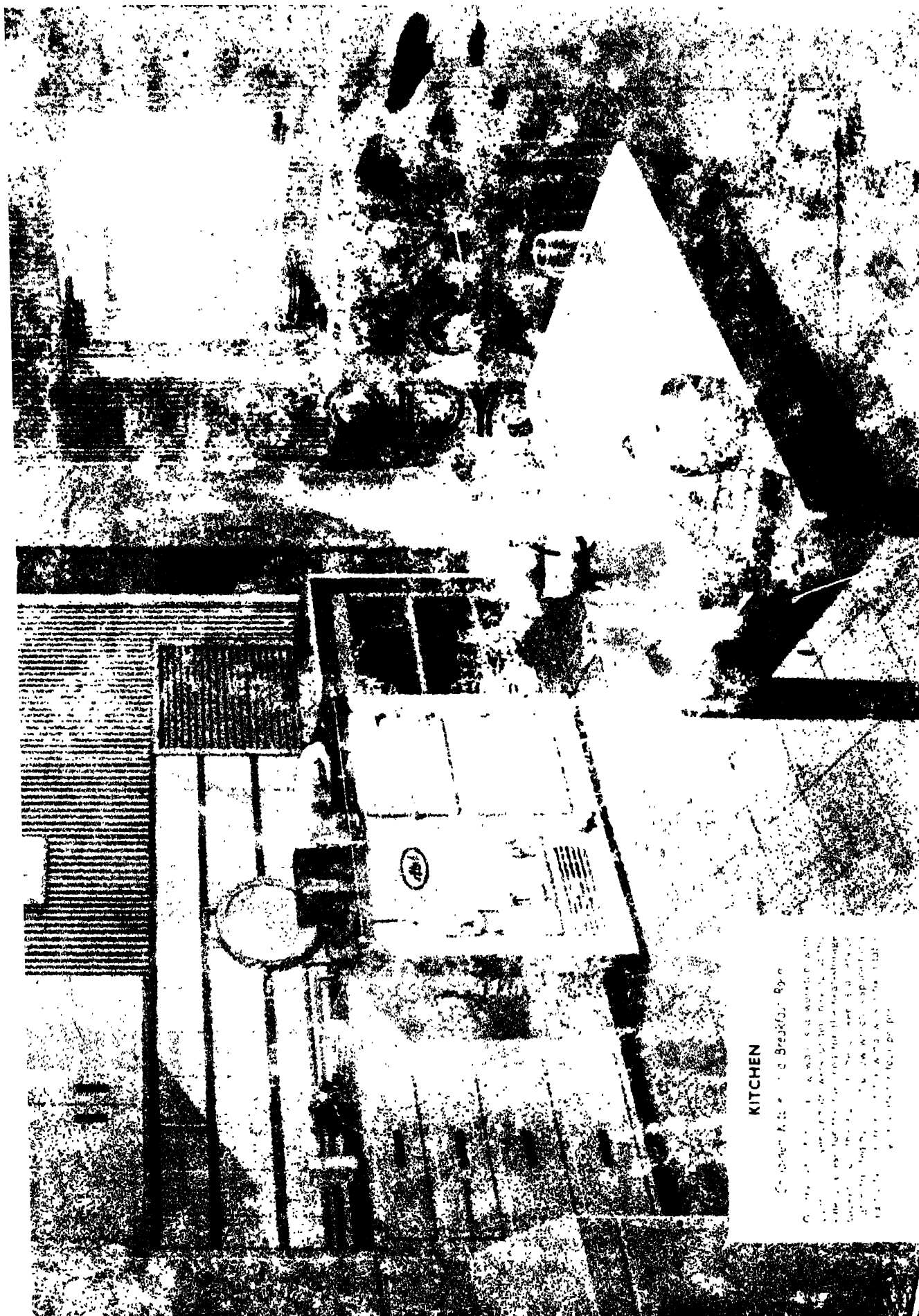


The Concise
HOT SEHOLD
ENCYCLOPEDIA



KITCHEN

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THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS 60637

The Concise HOUSEHOLD ENCYCLOPEDIA

A Guide to Every Branch of Homecraft by the
Author of "The Building, Decorating, Furniture,
Cooking, Sewing, Amateur Mechanics, Crochet,
Domestic Economy, Law, Health, Needlework, Poultry,
Pets & Animals, Hobbies, Gardening, Making & Mending"

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LINEN FOR THE HOUSEHOLD

How to Stock and Arrange the Linen Cupboard

Other information of interest in connexion with this important feature of home equipment will be found under Embroidery; Furniture; Lace; Laundry; Mending; Starch; Table Laying; See also the entries: Bedspread; Blanket; Cupboard; Tablecloth; Towel.

OBTAINED from the flax plant, linen is one of the most beautiful and useful of woven fabrics. Although improvements in the manufacture of cotton goods have led to their employment for many household and dress purposes in place of linens, the latter remain firmly in the housewife's favour on account of undoubted superior qualities of texture and durability.

Time has little or no effect on linen, as ancient embroideries on this material prove, and it is not subject to ravages by moths. New methods of dyeing and the old ones of grass bleaching under colour of linens are fadeable and white cloth fresh after their first laundering. Half-backed linen is in demand for embroidered handkerchiefs and dressing table sets, afternoon tea-cloths, and cushions.

The Nature of Linen. Flax stems are about 2 ft. long; their middle parts form the best line, and the tops and roots become tow. The finer linens are made from the longer and better flax of technical known as fine. Thicker and coarser fabrics, such as crash and canvas, are made from tow. The long fibres are not actually one and indivisible, but are built up of shorter overlapping fibres $\frac{1}{4}$ to $\frac{1}{2}$ in. in length, glued together by a natural compound called pectose. In wear, these shorter elements eventually come apart. Linen should not be boiled in soda, because washing soda weakens the pectose and disintegrates the filaments. It converts flax into fluff, and borax should be substituted for soda as a water softener.

The strongest, but not the smoothest, sewing thread is linen. Flax thread should be used for stitching carpets, boot buttons, and for any purpose in which exceptional strength is demanded.

The expert eye can see easily the difference between linen and cotton materials; the feel is different, and whereas linen rips with a sharp sound and the edges of the tear look smooth, cotton tears with a dull noise and the edges curl. Linen does not absorb or retain moisture so readily as cotton. If a damp cloth is passed over a length of cotton material, the surface will look rough; if the same is done to a piece of linen, the surface of the fabric will remain unaltered.

Linen is one of the best textiles to dye, because it is difficult to get the fast colour to penetrate far into the cloth. Successful methods are, however, absolutely guaranteed, and in made-up form or by the yard for embroidery or other purposes only **qualities** in coloured linens which are thus guaranteed to withstand both sun and washing should be purchased.

Table Linen. Although luncheon sets and dinner sets of mats and table centres are liked because of the ease with which they are laundered at home, and because of the decorative appearance which they give to the table when of coloured, embroidered, or lace trimmed linen, many housewives prefer an all-over cloth

for breakfast and for the formal dinner table. Coloured and checked linens are liked for the breakfast table.

Fine linen damask has always a beautiful appearance on the dinner table. Double damask is more expensive than the single kind, but its glossy surface is far richer and being more substantial washes and wears better. Coloured damasks are also liked especially for smaller tables. Used in harmony with glass, china and flowers or candles, rose, maize, green, or eury cloths present a most inviting appearance at luncheon or dinner. Even more beautiful are tablecloths in very damask. For festive occasions, damask cloths are used by their fortunate possessors for festive occasions. Decorative examples in the fine Irish linen trimmed with flax lace and insertion, or in the finer ivory linen with a peacock-made lace, give a handsomer effect than any other

Coloured sheets and pillow cases are expensive in linen, but an excellent effect is given by fagoting a wide hem of coloured linen to plain white sheets and pillow cases in place of the ordinary hemstitched border. The same method of decoration can be used for towels. Bolster cases are often dispensed with altogether, and a large pillow is substituted. To measure for pillow slips, run the tape measure along the pillow at the ends and sides and allow an extra inch on both results for bulk. Hem to bed edges count as extra measurements.

Linen is the best choice for table covers. Fine linen huckaback with damask borders in white or colours is expensive but wears well. Plainer towels can be trimmed at the ends with cross-stitched designs or with lace or crocheted. Embroidered monograms and initials always give a distinctive touch to linen. Dressing table sets look particularly well in colour with drawn thread work corners and hems, and large monograms embroidered in satin-stitch on each piece.

For round towels and kitchen cloths linen is undoubtedly the most economical purchase in the long run. It is also a far better fabric

for dust than ordinary cotton. Quilted cloths should be of linen with a small percentage of cotton to soften the material.

Printed linens for covers and curtains provide excellent wear and are usually of good design, though these linens as a rule do not show quite the brilliant colour patterns available in cotton fabrics.

The Linen Cupboard.

In house linen, as in other equipment for the home, space-saving ideas and other factors have limited the quantities considered necessary for the stocking of the linen cupboard. In smaller houses and flats there is usually a built-in cupboard provided for linen; if not, a movable one

should be installed. In some homes there is good accommodation for this purpose, and the hot-water pipes pass through the large cupboard or room which is also supplied with proper ventilation. Choose a spot near the landing radiator, kitchen range, or some other heating arrangement in the house to place a movable cupboard, if one has to be bought for the storage of linen.

Drawer accommodation should be provided for fancy tea cloths, mats, guest towels, and toilet covers which are not in constant use. Where a linen cupboard has only shelves, smaller articles can be kept in a series of cardboard boxes to ensure their freshness when required. Clean paper or old sheets or discarded pillow cases make linings for shelves, but a better way is to line with chintz or cretonne. Pieces of material are cut the exact width of the shelves but twice the depth, and these pieces are banded or neatly hemmed and attached to the wooden shelves with drawing-pins in such a way that the surplus depth hangs over the edge of the shelf, ready to be turned back over the piles of linen when these are arranged in their allotted spaces.

Various articles not of linen fabric are included in the term linen when it is used to denote the contents of the linen cupboard. Cotton sheets and pillow slips, bath towels, bedspreads of other materials, and blankets



World-famous for quality is linen made in Northern Ireland from home-grown and imported flax. Here wet linen is being laid out on the grass to be whitened in the sun.

form of table covering. Napkins should match the tablecloths used, and any other linen in the room, such as a sideboard runner, should also correspond in style.

Damask table linen in course of furnishing sometimes receives an injury which develops into a crack or cut and which does not appear until the article has been laundered once or twice. As soon as such a crack develops it should be mended carefully. If possible, one should buy linen from a firm which would replace such an unsatisfactory article. All cloths should also be purchased fully shrunk, otherwise after washing they may run up in width to the extent of 2 in. in a yard.

Afternoon tea-cloths, tea napkins, bridge cloths, breakfast tray sets, cocktail sets, and tray cloths can be handmade in linen, introducing decorations of coloured borders and appliqué embroidery, and every kind of good washing lace made of linen thread, drawn thread work, or crochet.

Bedroom and Kitchen Linen. Linen bed clothes—that is to say, sheets, pillow-slips, bolster covers, and bedspreads—make for coolness and ease. Bad sleepers and invalids find the texture of linen welcome and soothing, but others prefer cotton, especially twilled cotton. Linen union and linen-finished materials are superior in appearance to the all-cotton ones.

are all counted as house linen. When arranging the stock it is well to keep articles that are not so frequently required on the less accessible shelves.

Separate place for each description of linen. Single sheets should be in a pile apart from double, cotton pillow and bolster cases separated from linen ones, large bath towels from small, and the face towels in their sets. Articles newly returned from the laundry are naturally placed at the bottom of their respective piles, but they should first be examined for general condition, with a view to mending or replacement. Unduly delayed, these items can mount up alarmingly and become costly in time or money or both.

LINEN BASKET. The cane basket shown at Fig. 1 is not difficult to make. It should be about 24 in. high, 14 in. by 12 in. at the base and 2 in. wider at the top. Commence with a flat bottom with 12 stakes, as shown in Fig. 2, to a width of 12 in., and carry to a height of 14 in. with single cane weaving. The stakes may be held in a block of wood in which holes have been made at suitable intervals. If the upright stakes for the sides are driven in the side as suggested in Fig. 3, the outside stakes of the bottom should be of stout willow, but if the uprights are scalloped as in Fig. 4, all bottom stakes may be the same size. The upright stakes should be whole cane, No. 10 pulp cane will do, and should be at least 3 ft. 6 in. long. The four corner sticks should be either stout whole cane, willow, or $\frac{3}{4}$ in. birch dowel. A No. 5 pulp cane should be used for weaving, but it will be advisable to use a fine whole cane for the commencing as well as for the intermediate waling.

The first stage in the weaving of the sides is shown in Fig. 3. 10 upright stakes are driven in, each alongside a bottom stake, and bent upright. 14 stakes are secured to the sides,

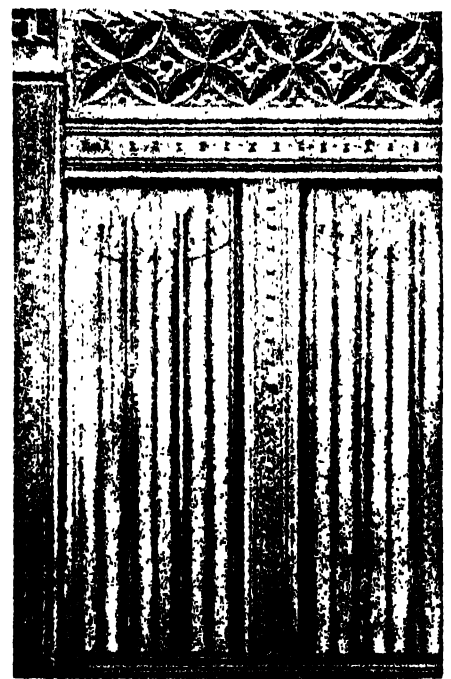
either by fitting them in a hole pierced in the side stakes of the bottom as indicated, or by the method shown in Fig. 4. The corner stakes are 24 in. high.

Commence weaving the sides as shown in Fig. 5 by working three lengths of cane alternately. A commences behind No. 1, is carried in front of 2 and 3, and brought to the front from behind 4. B starts from behind 2, is carried in front of 3 and 4, behind 5 and left in front of 6. C goes from 3, in front of 4 and 5, behind 6, and is left in front of 7. A is now picked up again, carried over the others in front of 5 and 6, behind 7, and left in front of 8. This is carried on until a corner is reached, when the method shown in Fig. 6 is followed, A representing the first length to be carried round the corner stick. Continue completely round the four sides and repeat for another two or three rounds.

Single rod weaving should now be done to a height of 2 or 3 in., and another round of 3 rod weaving carried round. Follow this by about 10 in. of single weaving, then another 3 rod wale, as it is called, a further 5 in. of single weaving, another 3 rod wale, and finish with single weaving up to border height. Continual measurements should be made in order to obtain the necessary splay.

The lid should be made in a similar manner to the bottom, but carried to a height of 16 in. The outside stakes should in this case be stout and the ends finished off with lengths of similar stuff, bound to the outside weaving with pulp cane. Another method is to make a complete frame with stout whole cane and form the stakes by the scallom method shown in Fig. 7. This will take a little longer, but forms a much neater lid.

The handle is made by bending a length of whole cane to about 2 in. diameter, binding it with either round or split cane, and attaching it to the lid with the same material; the lid is hinged by threading three or four rounds of cane under the two borders and securing the ends in the weaving. A heavier foot may be worked by turning the basket upside down, driving short lengths of cane



Linenoid decoration within a moulded framework. This example was found in Somerset, on the oak panelling of a 15th century farmhouse. By permission of the Director, Victoria and Albert Museum, S. Kensington.

alongside the stakes, running a row or two of a three rod wale, and then turning down the stakes to form an ordinary border.

A Round Basket. A round linen basket may be made by commencing from a suitable bottom and staking it up as shown on page 66. The sides should be filled up with randing with a three rod wale at intervals. The lid is made like the bottom, a border being formed by inserting short lengths of cane by the side of each spoke and laying them down as a border. Owing to the difficulty of keeping the stakes upright, this basket should not be attempted by the inexperienced. See Basket Making, Cane; Osier.

LINENFOLD. This is a form of decoration sometimes found upon furniture and the panels of walls, dating from the 15th century. It resembles folded linen and is seen particularly upon pieces of furniture and wainscots of the Tudor period. See Panelling, Tudor Style.

Ling. This is the popular name of the common moorland heather (*Calluna vulgaris*).

LING : The Fish. Ling may be prepared according to any of the recipes given for cooking cod, a fish it somewhat resembles in appearance. The tongue and sounds of the ling are usually sold separately in a pickled form. See Cod; Fish.

Liniment. See Embrocation.

LINK. There are a number of applications of the word link. As a unit of measurement it equals 7.92 in., 100 links making a chain in land surveying.

In the valve motion and other parts of many kinds of prime movers, such as steam and gas engines, a link is a connecting rod joining two parts of the mechanism together, and particularly described by a prefix, such as a vibrating link or a shifting link, the former performing a function in the valve motion, and the latter being used to transmit motion from one part to another.

LINNAEA. The linnaea, or twin flower, is a very pretty, trailing evergreen plant. The leaves are borne in pairs and the pink, bell-shaped flowers are in pairs on the stalk. It does well in moist peat in a cool part of the rockery. Propagation is best effected by means of division in autumn or spring.

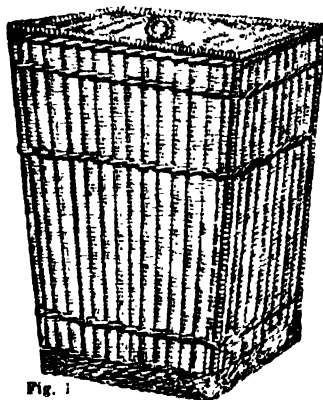


Fig. 1

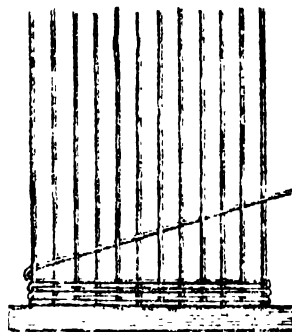


Fig. 2

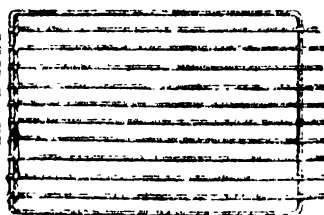


Fig. 4

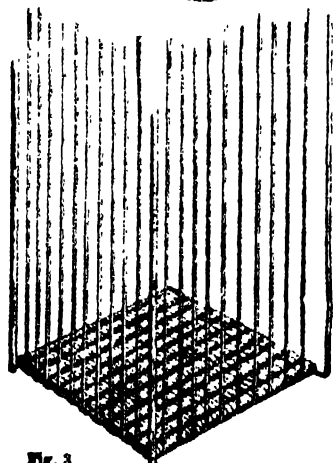


Fig. 3

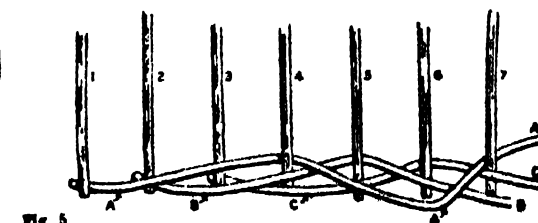


Fig. 5

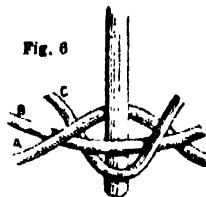


Fig. 6

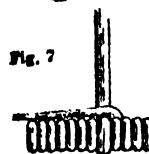


Fig. 7

Fig. 1. Square cane basket with lid. Fig. 2. Commencing on the bottom. Fig. 3. Upright stakes driven into sides, and weaving begun. Fig. 4. Another method, with scalloped uprights. Fig. 5. Showing how the weaving of the sides is begun. Fig. 6. Weaving round corner stakes. Fig. 7. Scallom method of forming stakes for lid.

LINOLEUM: PLAIN, INLAID, AND OTHER KINDS

With Directions for Laying, Cleaning, and Polishing

The reader is advised to consult further the entries in
rooms where Linoleum is used. See also Car-
peting; Bathrooms; Kitchen; Dining Room;
Floor; Finishing; Living Room; Bed Room;
Bathroom; Kitchen; Dining Room; Living Room;
Bed Room; Labour Saving.

Linoleum or floor cloth is often confused with oil cloth (q.v.). Oil cloth (or American cloth) is cotton cloth coated on one side with a flexible film of several coats of oil paint and is suitable only for covering tables and shelves.

Linoleum is particularly suitable for bath rooms, nurseries, and kitchens, as its surface is impervious to moisture, grease, and dirt, it is easy to clean, is durable and, if well laid, it has no cracks or crevices to collect dust. As it renders the floor practically air tight, linoleum is not recommended for ground floors which are at all damp.

Dampness, combined with the absence of air, causes linoleum to rot on the under surface, a condition which develops dry rot in the woodwork of the floor. Worn and uneven floors, either of boards, tiles, or bricks, such as are often found in old houses, should not be covered with linoleum, as the unevenness of the surface causes cracks to appear, thus making it anything but economical. Concrete, provided it is dry and smooth, can be covered with linoleum successfully, when fixed with special linoleum cement.

In remote tiny old cottages and country houses it is sometimes necessary to convert a second kitchen or washhouse into a bathroom. Cork or rubber linoleum is a suitable and warm floor covering, provided the floor is fairly level. If it is badly worn it should be floated with cement, then covered with felt paper, and the linoleum glued in position. An underlay is obtainable which prevents water from penetrating through to the floor and is particularly suitable for putting under linoleums in bathrooms and sculleries. By using the same linoleum through several rooms on the same floor it is possible to gain unity and a feeling of greater space. This is particularly to be recommended for small houses. The rooms on the second floor often open from a centre landing or passage, and the general appearance is improved if a uniform floor covering is laid. This arrangement is also more economical, as the linoleum cuts to better advantage, and good use can be made of cuttings left over.

The width of linoleum varies, but that for covering rooms is usually 72 in. wide, the price being quoted at so much per square yard. To ensure buying the correct quantity this must be taken into account. Thus, supposing it is required to cover the entire floor of a room 9 ft. \times 15 ft. This is 3 yds. \times 5 yds., therefore 15 sq. yds. is necessary. This amount is contained in a length 7½ yds. long and 72 in. wide, 7½ yds. \times 2 yds. = 15 sq. yds.

If a surround only is required, the amount can be calculated by deducting the area covered by the carpet from the area of the whole floor. Linoleum for covering stairs and passages can be bought either bordered or plain; the width varies, and for these purposes it is bought by length.

Varieties of Linoleum. Plain linoleum is of one colour, the price and quality varying according to its thickness. The advantage of this kind is that it goes well with either plain or patterned carpets and rugs and there is no pattern of which anyone can tire. Dark plain linoleums have the disadvantage of showing every footmark; on the contrary light shades of buff, grey, brown, or green are good colours where traffic is heavy. Inlaid linoleum has a pattern incorporating two or more colours, which cannot wear off, as it goes right through to the canvas. It is more economical to buy inlaid linoleum, although the initial cost is greater, for any floor subjected to hard wear. When buying,

examine the cut edge to see if the pattern is really inlaid. Such inlaid designs are made in good tiled designs and to imitate parquet flooring or with a marbled effect.

Painted or printed linoleum is plain linoleum with a design painted or transferred on to the surface with paint. It is considerably cheaper than inlaid.

Whatever the nature of the floor, it should be well washed and perfectly dry before the floorcloth is laid. Any old nails or boards must be removed. Loose boards must be fixed, and any uneven edges planed off. Holes and cracks should be filled with putty or plastic wood. Linoleum is brittle, and difficult to handle without cracking in cold weather, so if the floorcloth is being laid in winter it is better to leave it in a warm room for 48 hours before unrolling it.

A better result is obtained if a waterproof underlay or one of felt paper is first placed on the boards. This can be fixed in position by the use of a little paste or glue. The effect is the same as a carpet underlay—it acts as a cushion, deadening sound, and makes walking quieter and more pleasant.

How to Lay Linoleum. To do this successfully careful measurement and attention to detail are necessary. A plain lino shows defects and bad joins more than a patterned one, but when laying the latter extra care is needed to match the pattern successfully. Avoid unnecessary joins, and if possible arrange that there is no join at the doorway. A good arrangement is to cut it to run lengthwise in the opposite direction of the floorboards. The edges at the seams should be butted tightly against each other with the pattern carefully matched. Proper tacks without heads should be used, and placed about $\frac{1}{2}$ in. from the edge and at a distance of 4 in. apart. When knocked in, the top of the tacks should be slightly sunk into the surface of the linoleum.

To cut fairly long lengths it is better to rule a pencil line and place a long ruler, preferably one with a steel edge, on the line to guide the knife. It is not necessary to cut right down to the canvas, as, provided the knife has made an incision, it will readily break when folded back. A proper linoleum knife that has a curved end should be used. Special care is needed in fitting lines round pipes, radiators, doorways, and wall pro-



board and trace on the paper the
the corner. The paper is then
pattern for cutting the broken

A certain amount of expansion or tripping-out always occurs after hooch has been laid a short time, therefore it is a statutory to lay it at first temporarily, using a few tacks, but only where they are essential, and not along the sides of the room adjacent to the skirting. After the linoleum has been walked on for about two weeks it should be tinned again where necessary and finally nailed in position.

A treatment which is even more satisfactory and practically makes a jointless flooring is to provide a small triangular moulding to match the moulding on the skirting board. The lino can then be cut $\frac{1}{4}$ in. short of the skirting board. The moulding is tacked to the latter, and this keeps the lino in position and hides its edges. Lead thus the lino can expand without buckling. The moulding should not be tacked to the linoleum, but fixed to the skirting board in such a way that when necessary the lino can be drawn down under it.

Cleaning and Polishing. If properly cared for, lucidum retains its appearance, is easy to clean, and wears well. Wash it over with warm soapy water, but do not add washing soda or any strong cleaning powder of an alkaline nature. Alkalis act on the oil in the lucidum, removing a certain amount each time they are used, in the same way as soda water removes varnish on wood.

Scrubbing is only necessary on worn and neglected floors. It is best to wash only about a yard at a time, rinse off the soapy water, and dry with a cloth. If soapy water is allowed to dry on dark linoleum, white marks appear. The surface should not be swamped with water. The result of this can often be noticed by the linoleum rotting and chipping along the edges and joints. After washing, the surface can be renewed by rubbing in linseed oil, cedar oil, or wax polish. The first is suitable when a polish is not desired; it preserves the lino as well as wax, but does not give a gloss.

The best treatment to get an excellent surface is to rub floor-polish in thoroughly. A mop or an electric floor polisher with a long handle makes the polishing easy. Slippery floors are caused by extravagant use of floor polish, insufficient rubbing off, or by using the polish too thick. This should be thinned in cold weather with turpentine.

Painted linoleum wears better and retains the colour if it is coated with varnish or white shellac. All dirt must first be removed and the floor thoroughly dried. Apply the varnish as evenly as possible, and leave it for at least 12 hours before the floor is used or the second coat applied. It is better to apply two thin coats, as then the varnish will probably only require renewing once a year. Varnished lino can be kept in good condition by mopping with a slightly oily mop.

LINSEED. In the form of a poultice linseed is a household remedy for applying warmth and moisture to a part for relieving pain, and as a counter-irritant in deep-lying inflammation. Linseed is also used in the preparation of oil paints.

Linseed Poultice.

To make a linseed poultice, to 2 oz. of crushed linseed add 5 oz. of boiling water, or larger quantities if need be. Stir continuously while the water is being added. The poultice should be prepared immediately before use and should be applied



Linoleum. Fig. 1. How to cut, with a sharp knife and steel-edged ruler. Fig. 2. A proper linoleum-cutting knife makes the work much easier. Note position of left hand

as hot as the patient can stand it. A flannel bag should be roughly stitched together to receive the poultice, and this will retain warmth much longer if it is overlapped all round by a piece of oiled silk or paronet.

Linseed Tea. Linseed tea is an old-fashioned remedy for certain kidney diseases and coughs. Put 2 oz. of linseed, $\frac{1}{2}$ oz. of liquorice, and 1 quart of boiling water in a jug. Cover, and let it stand near the fire for four hours. Strain through fine muslin. Do not crush the linseed.

LINSEED OIL. There are many uses for linseed oil in the home, particularly for polishing furniture. If an old piece of oak or other furniture does not respond to ordinary treatment, it should be washed with warm water and soap and well rubbed with linseed oil daily until the desired effect is obtained.

Mahogany is subject to a cloudiness known as bloom; this requires gentle rubbing with hot water and vinegar, and then with warm water to which linseed oil and turpentine have been added in the proportion of a dessert-spoonful of each to a pint of water. Linseed oil can be used for stained and varnished floors. It should be allowed to soak in and then be rubbed over thoroughly with a clean cloth.

When whitening is used for cleaning pewter it should be moistened with linseed oil and turpentine. Bronze ornaments can be wiped occasionally with a cloth moistened with linseed oil and polished with a dry cloth or chamous leather. Leather coverings of chairs are improved by polishing with linseed oil and vinegar in proportion of two to one. Creaky boots can be stood on their soles in a vessel containing linseed oil. See Paint.

LINSEY. When cloths were woven at home from linen and wool, linsy-woolsey was a coarse union fabric with linen threads in one direction and woollen in the other. Linen has been superseded for that purpose by cotton. Rag merchants still call wool and cotton stuffs linses, as rags they are inferior in value to all-wool, and are sorted out separately.

LINT. A soft linen fabric, smooth on one side and shagreened on the other, lint is used for applying ointments, lotions, and liniments, and otherwise in surgery. Lint impregnated with boric acid, salicylic acid, and other drugs can be obtained at the chemist's. These form a convenient dressing for wounds, etc., applied dry or moistened with boiled water. When used on a broken surface the smooth side should be applied, as it is less likely to adhere than the other. See Bandage; Dressing.

LINTEL. In a house the lintel is a horizontal beam which supports that part of the wall built over a doorway or window. It may be constructed either of wood, metal, stone, or concrete. As to dimensions, if a new lintel is to be used, as in constructing a new window opening, the size for a wooden lintel should be at least $4\frac{1}{2}$ in. wide, and 3 in. deep for a span not exceeding 3 ft.

Ferro-concrete lintels are made by building a boxing of rough wood around the opening and filling it with concrete, 2 or 3 iron bars are embedded into the concrete, and should be about $\frac{3}{4}$ in. in diameter. Another method is to prepare the concrete lintel at least a month before it is intended to fix it, making it up in a wooden mould. See Concrete.

LION'S TAIL. This is the common name of a greenhouse shrub, *Leonotis leonurus*, which bears whorls of scarlet flowers in winter. It is increased by cuttings in spring, and thrives in ordinary potting compost of loam with a little leaf-mould and sand. The plants may be placed out of doors for the summer, but must be brought into a slightly heated greenhouse in autumn.

LIP. The lips are subject to certain diseases and affections, among the most ordinary being chapped lips. One of the best

applications for this condition is an ointment made of lanoline 1 oz. and boric acid 1 dram; or one can use ordinary boracic ointment or a mixture of four parts glycerin and one part Friar's balsam. Chapped lips should on no account be allowed to remain untreated.

Herpes of the lips is common in severe colds, little vesicles forming, which dry up after a time. They should not be pricked. Bathe with some warm boric acid solution, $\frac{1}{4}$ teaspoonful to a tumbler of water, and rub over with vaseline or cold cream. In eczema the lips are often scaly. Bathe with a lotion of one teaspoonful of glycerin to 2 tablespoonfuls of rose water, or apply cold cream, to each oz. of which is added 5 grains of salicylic acid.

Cancer of the lip is chiefly met with in men. It is often thought to be due to irritation from the short stem of a clay pipe. Because of the supreme importance of early operation, any ulcer on the lips should be brought to a surgeon's attention if it seems slow or dilatory in healing.

LIPSTICK. Lipstick can be bought in various shades, and either glossy or dry, and also indelebile. Cheap brands tend to coarsen and roughen the lips. It should be applied firmly, following the natural outline of the mouth, which should then be dabbed with face tissue to remove surplus. For evening wear, particularly where fluorescent lighting will be encountered, an orange lipstick should be worn. This prevents the lips appearing purple, as happens with red lipstick under fluorescent light. See Beauty Culture, etc.

LIQUEUR. This is a sweetened alcoholic beverage. Most liqueurs are made of equal proportions of alcohol and sugar cane syrup, flavoured with essences or herbs; a few contain no syrup, but are mixtures of vermouth and gin. Among the best-known liqueurs are Advocat, Benedictine, Chartreuse, Combreau, Curaçao, Drambuie, and Grand Marnier.

Some liqueurs are distilled from cherries soaked in brandy, the chief being cherry brandy, Kirsch, Maraschino, and Noyau. Cherry whisky is obtained by soaking cherries in whisky, also gin by soaking slices in gin. Other liqueurs are made from apricots, peaches, blackberries, or blackcurrants, soaked in spirits. South Africa produces a liqueur called Vander Hum, which in taste and colour somewhat resembles Benedictine. Mint is used in some liqueurs such as Crème de Menthe; caraway seeds in Kummel; aniseed in Anisett.

The term liqueur is also applied to unsweetened spirits of exceptional bouquet. Thus a liqueur brandy or a liqueur whisky is a

brandy or whisky of age and quality. Cognac is the chief liqueur of connoisseurs. See Brandy; Chartreuse; Kummel; Maraschino, etc.

Liqueur Glass. This is a small glass made to hold liqueur. Such glasses are made in various qualities, from the finest cut or engraved glass to a plain and cheap variety, and in several styles. They are often sold in sets of six with decanters and tray to match, and some of these sets are copies of antique patterns. Liqueur glasses, however, are themselves modern, their predecessors being the cordial glasses of the 18th century. See Glass.

LIQUIDAMBAR. The best species of this group of hardy shrubs is styraciflua, which is grown chiefly for its brilliant autumn leaf colouring. In time it develops into a large tree. It thrives in ordinary soil and is propagated by seeds or layers. In its native country, the United States of America, it is a valuable timber tree.

LIQUID MEASURE. This measure, used for milk, beer, and other liquids, and some shellfish, is as follows: 4 gills = 1 pint; 2 pints = 1 quart; 4 quarts = 1 gallon.

LIQUORICE. The extract of liquorice root is used in medicine as a demulcent and as a flavouring agent. It covers the taste of ammonium chloride, cascara, and other drugs. The compound liquorice powder which is used as a laxative contains senna and sulphur. About a teaspoonful of it should be taken in a little water in the evening.

The liquid extract is a common constituent of cough mixtures, and the dry extract of cough lozenges. Sticks of Spanish liquorice provide the drug in a handy form. Small pieces can be broken off and sucked for the relief of an irritable cough. Dyspepsia may also be relieved by it.

LIRIODENDRON. A hardy, tall growing, flowering tree, often attaining a height of from 70 ft. to 80 ft. Liriodendron tulipifera likes a sandy loam, and is an ideal specimen tree for a lawn. The leaves are large, saddle-shaped, and bright green in colour, while the greenish yellow flowers are fragrant. The shape of these flowers gives the liriodendron its popular name of tulip tree. Propagation is by sowing seeds.

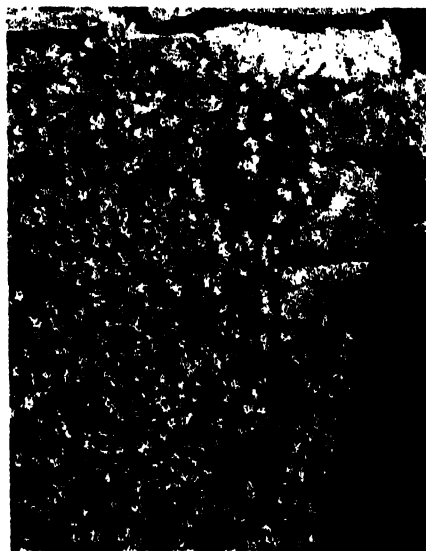
LISLE THREAD. The wearing power of lisle thread is well recognized, and the tops and feet of silk stockings, being the parts which receive the greater wear, are frequently made in lisle. The thread is a well-spun cotton, owing its wearing power in large measure to its tightness of twist.

LITHARGE or **LEAD MONOXIDE.** Litharge is made by roasting molten lead in air. Straw-yellow in colour, it forms part of various lead compounds, is used in paint mixing as a drier, in pottery for lead glazing, in the manufacture of flint glass, and in the plates of accumulators or storage batteries.

LITHIUM. The salts of lithium have long been used to remove uric acid from the body in gout. This they accomplish by replacing sodium urate by the much more soluble lithium urate. Lithium salts also act as diuretics, that is, they increase the flow of the urine. The preparations mostly used are lithium carbonate, 2 to 5 gr.; lithium citrate, 5 to 10 gr.; and effervescent lithium citrate, 60 to 120 gr. The waters of Baden-Baden, Carlsbad, Kissingen, and other places contain lithia.

LITHOSPERMUM. These hardy trailing plants need peaty soil and a sunny place in the rock garden. The best is prostratum, Heavenly Blue, an evergreen which bears beautiful blue flowers in spring and summer. It is increased by cuttings inserted in sandy soil in a frame in July and August.

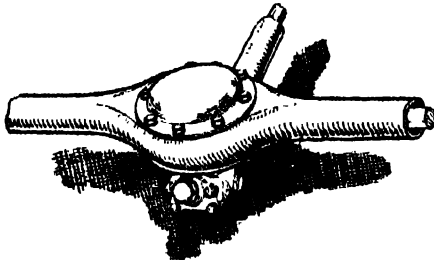
LITRE. The litre is the unit of capacity in the decimal or metric system. It is equal to 22 gallon and, roughly speaking, $4\frac{1}{4}$ litres make 1 gallon. See Metre.



Lithospermum. The lovely blue flowers of *L. prostratum* in a rock garden

LIVE AXLE: Of the Motor Car. The rear or live axle of the motor car is the final step in the drive between the engine and the back wheels, and on it depends in a large measure the road speed and efficiency of the vehicle. It constitutes a rigid structure carrying the wheels and braking mechanism, supporting the weight of the car, and serving as a suitable casing for part of the transmission.

There are various patterns of live-axle casings. The banjo design (Figs. 1 and 2) is



Live Axle. Fig. 1. Horizontal banjo type axle casing fitted with underneath worm drive

all in one piece, and is provided with a large inspection cover which, when removed, exposes the whole of the axle drive, so that it can readily be got at for adjustment.

There are three main types of live axle in use, namely, the semi-floating, the three-quarter floating, and the full-floating. The chief difference in design between the three types lies primarily with the method by which the wheels, or, rather, the hubs of the wheels, are mounted on or connected to the axle or axle-casing. With the semi-floating type the live axle, apart from driving the car via the road wheels, have also to sustain the full weight of the rear of the vehicle. The bearings in which the axle shafts rotate also act as the bearings for the road wheels. In the three-quarter floating axle, intermediate in type between the semi- and full-floating axles, the road wheels have

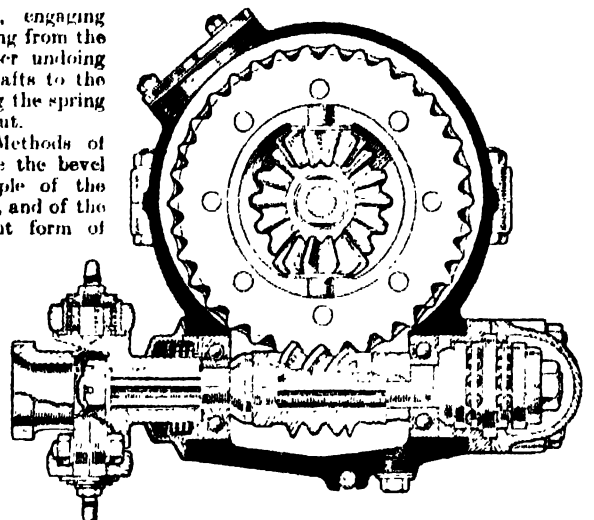
place by a spring ring, E , engaging recesses in teeth, E_1 , projecting from the ends of the wheel hubs. After undoing the nuts, B_1 , that lock the shafts to the road-wheel hubs, and removing the spring ring, the axles can be drawn out.

Driving and Lubrication. Methods of driving the live axles comprise the bevel and worm types. An example of the former is illustrated in Fig. 3, and of the latter in Fig. 4. The straight form of bevel gearing is not now used in cars, but has been superseded by spiral bevel gearing, as in the example illustrated. A form of double helical gearing is found on some vehicles. In the worm drive (Fig. 4) the worm is mounted in ball bearings, end play being resisted by a double thrust bearing.

Worm gearing is silent in action, even when it becomes worn, but is more liable to damage in the event of lubrication failing. Should oil run short the gear may be entirely ruined during a run of a few miles under such conditions.

The lubrication of live axles must be so carried out as to ensure a proper supply to the working parts, while preventing any leakage from the ends of the axle on to the brake drums. The creeping of oil along the shafts is prevented by providing baffles, A_1 , in the axle casing, A (Fig. 3), and although some oil works along and serves to lubricate the roller bearings, leakage is stopped by the felt packed rings, A_2 (Fig. 3). See Motor Car.

LIVER: Nature and Diseases. The largest gland in the body is the liver, which weighs about 53 oz. in a full-grown man. The greater part lies under the ribs on the right side of the body. Above it is the diaphragm, which separates the chest from the abdominal cavity; under the liver are part of the stomach and large intestine. Attached to the



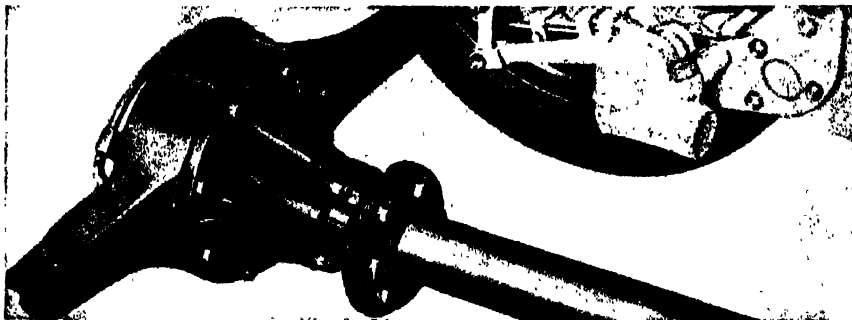
Live Axle. Fig. 4. Underneath worm drive with radial and thrust ball bearings keeping the worm in correct position

undersurface is the gall bladder, the storehouse of bile which is manufactured by the liver

The hepatic artery brings blood for nutriment of the liver; the portal vein brings blood collected from the stomach and intestines which contain all the absorbed food except the fat. The hepatic veins carry away the whole blood supply of the organ, and the bile ducts convey the bile into the intestine. The bile ducts are so arranged that while part of the bile passes directly into the intestine another part goes to be stored in the gall bladder

The liver is composed of millions of minute cells, each of which is a factory for the production of bile, glycogen, sugar, and urea. Bile, which is a reddish-brown or dark green fluid, is an important factor in digestion; it aids the pancreatic juice, especially with digestion of fats, and stimulates the movements of the intestine. The liver removes sugar in the blood coming from the intestines and converts it into glycogen; this is stored up in large quantities after meals and is then given out as sugar to the blood as required. Urea, the poisonous substance produced from the disintegration of protein food (meat, eggs, fish, etc.), is made by the liver, as is also uric acid. These pass into the blood and are excreted from the body chiefly in the urine

Diseases of the Liver. These may or may not be accompanied by jaundice. Some diseases cause enlargement of the liver, others diminish its size. Enlargement may be due to a number



Live Axle. Fig. 2. General view of Flat live axle casing of the banjo type

their own bearings, which run on the outside of the axle casing. The weight of the car is thus transmitted directly to the wheels. The axle shafts are supported at their outer ends by the hubs of the wheels, to which they are secured as solid: therefore, although the road wheels are stabilized by the axle shafts, a very large proportion of the bending stress in the axle shafts has been removed.

Fig. 3 is the full-floating axle, and with this the location of the road wheels is in no way dependent upon the axle shafts, as the hubs, B , are mounted on ball (or roller) bearings located on the axle sleeves. A brake drum, C , and a detachable wheel, D , are secured to each hub, B . The axle shafts, being suitably connected to the hubs, act as the driving medium only, and are not subjected to the bending stresses to which the two former types are prone. The ends of the axle shafts that enter the differential case, and engage the differential sun-wheels are splined, and are kept in

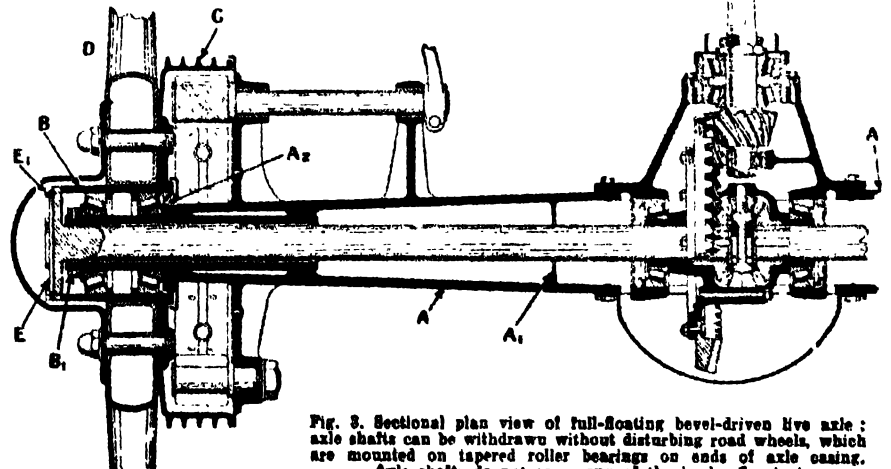


Fig. 3. Sectional plan view of full-floating bevel-driven live axle: axle shafts can be withdrawn without disturbing road wheels, which are mounted on tapered roller bearings on ends of axle casing. Axle shafts do not carry any of the load. See text

of causes, including the following. Fatty infiltration, occurring in obesity and chronic alcoholism; acute inflammation, or hepatitis, due to the poison of a fever, alcohol, etc.; chronic congestion, which may accompany indigestion; passive congestion, occurring in advanced heart or lung disease; abscess, which may be due to amoebic dysentery, and amyloid disease, the result of degenerative changes commonly caused by syphilis.

Diminution of the liver occurs in alcoholic cirrhosis, in poisoning by phosphorus and other substances, and in certain other diseases, including acute yellow atrophy.

The term liverish feeling is synonymous with biliousness and is dealt with under that heading.

Liver Pill. Pills which relieve biliousness and increase the activity of the liver are popularly described as liver pills. A large number of drugs have this action, including podophyllin, rhubarb, aloes, calomel, colocyth, sulphate of soda and others. The following is an example of such a pill: Extract of podophyllum, gr. 4; extract of hyogcyamus, gr. 2; pill of aloes, gr. 2. One or two to be taken at bedtime. See Digestion; Indigestion; Jaundice.

LIVER: In Cookery. The liver of the calf, sheep, pig, and bullock are all much used in cookery. Calf's liver is generally considered the most delicate in flavour; bullock's liver is sometimes rather coarse. Liver can be fried, stewed, or served up in a number of made dishes.

To fry liver with bacon, wash 1 lb. liver in tepid salted water, dry it, and cut it into slices the way of the grain, about 1 in. thick, removing any skiny or muscular pieces. Cut off the rind and the rough brown skin from ½ lb. fat streaky bacon, afterwards cutting the latter into thin slices.

Heat a frying-pan, lay in some slices of the bacon and fry them gently until lightly browned on each side. Take them out of the pan and keep them hot. Mix 1 oz. flour on a plate with a good seas. mix. of salt and pepper; draw each piece of liver through the flour and at once lay it in the hot fat in the frying-pan, and fry it slowly until it is well browned on each side. Fry a few pieces at a time, as they must not be on the top of each other. They will probably take about 10 min. to cook through.

When thoroughly cooked, lift the liver out of the pan and put it with the bacon to keep it hot. Add 1 oz. bacon or beef dripping to that in the pan, stir in ½ oz. flour, and fry it until brown. Pour in ½ pint stock and stir this gravy over the fire until it boils, then season it carefully. Arrange the liver neatly in a hot dish, the slices overlapping each other; strain round the thick brown gravy, and garnish with the fried bacon.

Stewed liver makes a change from fried liver, and is more digestible. Soak in salted water about an hour, dry, and cut 1 lb. liver into fairly thick slices. Melt 2 oz. dripping—either beef or bacon—in a saucepan, and when it is hot stir in 1 oz. flour and 2 tablespoonfuls finely chopped onion.

Fry these a rich brown, and stir in 1 pint good stock or water and a little meat extract. When the whole has boiled and thickened, put in the liver, a good-sized carrot, cut into cubes, a bunch of herbs, a couple of sticks of celery, chopped into small pieces, and a small teaspoonful of salt. Cover the pan and let the liver simmer for about 1 to 1½ hours. When tender arrange it neatly on a hot dish, strain over the seasoned gravy, and garnish the liver with fried bacon or ham, and some of the cooked carrot.

Bullock's liver added to stewing steak, in the proportion of ½ lb. liver to 1 lb. beef, makes the stew richer and more palatable. This is especially so when inferior cuts of beef are used.

An easily prepared dish is a fricassee of liver and tripe. Cut some cold, cooked tripe and some liver, equal quantities of each, into strips. Fry the liver, after soaking in salted water, and put it on a dish in the oven to keep hot. Dip the slices of tripe into seasoned flour, fry them, and add them to the liver. Next fry some sliced onions, and with them make a border round the dish. Over the whole pour some thick brown gravy or brown sauce, and serve at once.

Liver Force meat.

Liver force meat is used for stuffing game, pigeons, quails, and other birds. It is made with ½ lb. calf's liver, 3 oz. fat bacon, ½ onion, 1 shallot, 1 oz. dripping or butter, 1 teaspoonful mixed herbs, a pinch each of cayenne and nutmeg, and pepper and salt to taste. The liver and bacon must be finely minced and browned in the fat in a frying-pan, the onion and shallot minced, the herbs and seasoning added, and all stewed gently until tender. The mixture is then pounded in a mortar, rubbed through a wire sieve, and mixed to a paste with the yolk of an egg.

Liver Sausage. Boil 1 lb. moderately lean pork, then mince it finely. Wash and dry 1 lb. sheep's or calf's liver, mince that also, and mix it with the pork. Add and mix in very thoroughly 2 small onions, chopped very finely, a level teaspoonful pepper, a dessertspoonful salt, a good pinch of powdered nutmeg and cloves, and a level dessertspoonful powdered mixed herbs, including sage. Melt 4 oz. lard and add that also.

This mixture is then put into large sausage skins, but should only fill them very loosely. Tie them at both ends, drop them into boiling water, and let them simmer for about 40 min. Drain them and hang them up until required.

Value in Therapeutics. Treatment of anaemia by feeding with about half a pound of liver, raw and cooked, each day has had favourable results. The raw liver is given in sandwiches, or a reliable extract may be chosen.

LIVERPOOL WARE. Earthenware and chinaware of Liverpool origin fall mostly within the later half of the 18th and the earlier half of the 19th century. Among the earlier pieces were punch-bowls with maritime scenes, usually in blue, often made to commemorate some famous voyage, and tavern mugs with doggerel rhymes.

There was a large output of salt-glaze and delft, sometimes recognizable by its bluish tinge, as well as ware printed by Sadler, the inventor of transfer printing. Blue dash chargers are large dishes bearing crude devices of scriptural and royal personages, for cottage use. The cream-ware, bone-porcelain, and other Staffordshire styles which

were copied at the Toxteth Park pottery for half a century after 1794 frequently bear the works name, Heiculanum. See Delft Ware; Lambeth Ware.

LIVERY. As understood to-day a livery is the distinctive dress worn by certain classes of male servants. An example is the serviceable livery of the chauffeur. This consists of coat or overcoat and peaked cap, with breeches and leggings, the coat of Melton and other cloth being coloured grey, black, dark blue, or dark green. Liveries are usually provided by the employer. There is no tax on the wearing of a livery, and no licence is now needed for a manservant.

LIVERY CUPBOARD. This is a type of cupboard in use in England in the 15th, 16th and 17th centuries. With the allied court cupboard, it was the forerunner of the dresser and the sideboard. The livery cupboard is usually smaller than the court cupboard, and was sometimes, therefore, placed on the top of the latter. It had an open front generally decorated with a series of turned pillars. These cupboards were often placed in bedrooms so as to hold food which could serve for the long interval between the evening and the morning meal. See Cupboard.

THE LIVING-ROOM AND ITS FURNISHING

How to Combine Beauty with Comfort

The reader may consult the entries on the various items of furniture mentioned, e.g. Chair; Settee; Writing Table, and those on the other rooms of the house. See also Carpet; Colour; Cottage; Decoration; Electricity; Fireplace; Flat; Gas; House; Panelling.

As its name suggests, the living-room should be the type of sitting room which people really want to live in and not merely to use on formal occasions. In choosing decorations and furniture extreme fashions should be avoided, unless they embody some particularly apt style for the room in question; as for instance, period reproductions for an old-world setting. The largest, sunniest, and most convenient room in the house should be selected for the room in which the family will spend much of their time indoors.

In general, rooms that face south or south-west are the best lighted and most cheerful. Those with windows on two sides have advantages, whilst north rooms with a beautiful expanse of country in front are preferable to a south room that looks on to brick walls. Extension on to a loggia or a veranda is an asset to a suburban or country living-room.

Walls and Floors. The treatment of walls allows plenty of choice. Pleasing colours in paint, distemper, or wall-papers of good design cost no more to buy or to apply than ugly, drab colours. Where economy has to

be studied, the decoration should receive particular care, seeing that it will have to last for years.

In many small houses and bungalows the woodwork is not painted, but merely dyed or stained to imitate different woods. A wood-preserving stain, such as solignum, should be used, and linseed oil rubbed in to make the wood water-resisting. Panelling is a favourite method of wall treatment in some of the modern as well as period living rooms, and is especially successful when carried out in natural woods wax polished, rather than in a heavy imitation of Jacobean style.

Distemper in all shades is obtainable and has advantages. It is cheap, and can be renewed quickly without skilled labour; but for a living-room, particularly where there are children in the family, it is not always satisfactory. Even light knocks remove the surface and show plaster underneath, while fingermarks are not easily removed, and grease-marks are even more persistent. Distemper is not suitable for old walls the surface of which is bad. The better way, where it can



Liverpool Ware. Delft bowl with the inscription inside, "Drink Faire, Don't Sware." Date 1728

be afforded, is to use paint or enamel. Painted walls need no attention, other than washing, for some years. Grained and marbled surfaces are particularly suitable for this type of sitting room, as they provide a slight, pleasing variation in colour without the tiring effect of a definite pattern. All the plainer wall surfaces possess the advantage of allowing the housewife to change the appearance of her room completely without mural redecoration, by having a second set of curtains and covers for the furniture, or by using loose cretonne covers and light curtains in summer and showing the upholstery fabric of some durable type that will not easily soil in the winter, with curtains in a rich and warm shade of velours or velvet.

These effects of graining and marbling can be obtained in wallpaper if the expense of painting is too great. Pale tones and unbroken surfaces are, however, still better for the small room with a poor window allowance. Such treatment seems to push the walls away. Patterns or heavy panelling, on the contrary, have the effect of pulling them in.

Where there are no beams or supports which visibly mark the ceiling it is restful to have this the same colour, or a lighter tone of the same colour, as the walls. The absence of a cornice in many modern rooms increases their apparent size. Flush doors also seem to enlarge wall space, while decorated or panelled doors give interest to bigger rooms. Wooden pelmets to the windows, either in oak or stained or painted wood, are another detail which is a particularly happy idea in the modern living-room. It ensures a neat window line, and the trouble of making or changing curtains is greatly lessened if there is no valance or fabric pelmet to be considered each time of such renewal.

A living-room can be uninteresting if there is too little colour contrast and pattern; it can be cut up and made tiresome and disturbing with wrong choice of these, or with too many pictures and ornaments. It is usually safe to build up from the darkest colour note on the floor to the lightest on the ceiling. Where there are old oak beams or a modern version of these, the plaster between them should be kept to a warm cream; and if the wall treatment is dark panelling a wide frieze of light colour greatly improves the appearance of the ordinary-sized room.

Carpets are the most suitable covering for living-room floors. It is usually desirable to strike the note of comfort which a carpet gives, but which is lacking with other floorings. Choice should be limited to hard-wearing carpets in colours that do not show every foot mark or are easily damaged by mud. A too-pronounced pattern on a carpet will often destroy the harmony of a whole room. Imitation Persian carpets in velvet pile, or modern ones with geometrical designs, are suitable. The hard-wearing qualities of hair-carpet on a rubber base, laid and fitted like linoleum, make it a most useful floor-covering, and it is an excellent background in its natural colour for rugs. In a bungalow or cottage living-room, fibre or rush matting might

be substituted, especially in a week end or summer holiday house of this type. Wide surrounds of parquet or other evenly cleaned flooring are desirable in a room which will be much used by a family.

Heating and Lighting. An open fire is the usual means of heating, and it is quite economical, especially for rooms that are in use during the whole day. Gas fires and electric radiators, it is true, do away with the filling of scuttles and cleaning of grates, but they do not convey the same sense of comfort and

The comfort of the family also depends considerably on efficient lighting of the living room. The diffused type of lighting is not sufficient in a room where work is done, unless separate small lamps are provided. The actual method of lighting is controlled largely by what is available. Electricity is both convenient and clean, incandescent gas gives good light, but the months need care or frequent renewal will be necessary. In districts where neither of these means of lighting is available, pressure lamps burning a mixture of air and paraffin vapour and producing a 250 candle-power light are most suitable for living room.

Furnishing Ideas. The furniture required naturally depends not only on the size and type of room, but also on the size and taste of the family. Bookshelves will fire the only where the household are literary. One writing table would not be sufficient when several members wished to use it, and desk. The addition of a bureau or two small ones solves the problem, and when used they encroach little on the floor space. Plenty of cupboard room is an excellent feature, so that unsightly looking working or amusement outfits can be stowed away.

Our illustrations provide some excellent ideas for the decoration and furnishing of delightful living rooms. Fig. 1 shows the window end of a large living room. The general scheme is simple, and without superfluity of pattern or ornaments. Comfort is ensured by the heavy pile carpet and by the chairs and settee upholstered in the same style. The window admits abundance of light, and there is a door, visible on the right, which leads on to a clozard. The curtains are of a transparent, lightly patterned fabric for summer use, which gives a beautiful quality to the light from the window. The walls are painted, finished with a glossy surface, and the ceiling is the same colour except for the wooden beams. The floor is of wood blocks.

The fireplace, at the other end of the room, not seen in the photograph, is a beautiful example of brickwork, in keeping with the beamed ceiling, and is without fender or mantelpiece. Its decoration lies in the design of the brickwork on the surround and raised hearth. The writing desk and bookcase are both of mahogany, which wood has also been



Living-room Fig. 1. Window end of the living-room described in the adjacent text. A form of diffused lighting is provided by the ceiling fitting of tubular glass attached to the cross beam

companionship. The back fireplace seems particularly suitable to the country type of living-room. Bar grates can be modernised at small cost, with a barless front which increases the width of the grate and brings the hot fuel further into the room. When new stoves are being fitted, the question of a sitting room stove with a boiler at the back is worth consideration. Economy of fuel combined with increased comfort is thus obtained. Stoves for use with open or closed fires which burn any kind of fuel and can be kept alight day and night are sometimes a suitable choice.



Fig. 2. Old world living-room in a country house. The simplicity of the wide hearth, massive beams, and plaster walls is pleasantly contrasted by the comfortable armchairs and settees and enriched by the fine piece of tapestry

Humphrey & Vera Jull

selected for the low table in the window and for the floor standard seen in the picture.

A contrast is provided in the second illustration. This living-room is in an old house in Sussex. The heavy cross beams are worn uneven, the walls and ceilings are roughly plastered, the casement windows are diamond-paned. The fireplace has a wide, tiled hearth and solid oak shelf on which are collected respectively interesting specimens of hearth furniture and some beautiful old pieces of china, quite suitable for the room. Velvet is chosen for the upholstery and curtains, except for the cane-backed and cushioned settee on the right, which is covered with shot silk rep.

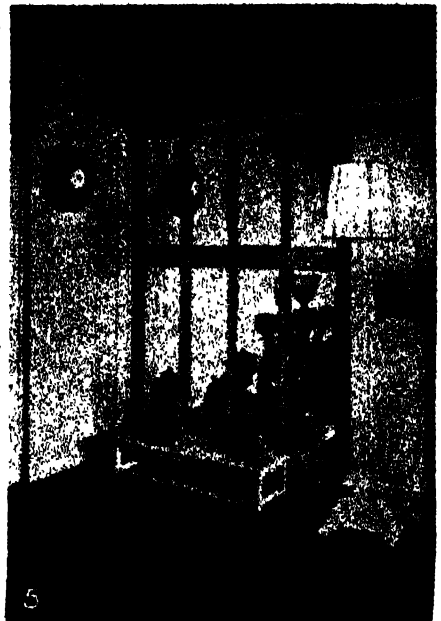
Pictures are not wanted on the low walls, and also they would detract from the tapestry above the settee, and there is little wall space left with the other window, door, and accommodation for books. Lighting fittings have been well thought out. There is a charming bracket fixture over the armchair on the right, and on the other side of the fireplace the light standard with its fringed shade is equally harmonious in this room.

In Figs. 3 and 4 two views of a modern living-room are shown. For a comparatively small room in a town house or flat, the decoration and furniture are beautifully designed and chosen. The panelled walls are finished in glossy enamel of a pale colour and the wide frieze and the ceiling are of the same colour, but finished with a mat surface. The fluted wooden pelmet fixture should be noted and also the beautiful window treatment of coloured net glass curtains and silk practical ones to tone with the modern carpet. The loose covers have a geometrical pattern, and an interesting feature is the excellent accommodation for books on shelves built into the space below the windows. These shelves are divided by useful little cupboards. In Fig. 4 the fireplace is seen, with its attractive tiles, pillars and mantel treatment. The lighting fittings are particularly harmonious, with their plain shades and shields. Every detail is charmingly thought out and the placing of the pictures should be noted, and of the ornaments on the windowshelf. The one richly decorated piece of furniture in the room is the painted Czechoslovak cabinet on the left of the window.

Fig. 5 shows in detail the mirrored corner of this room, visible in the background of Fig. 4. This clever arrangement is not only an attractive decoration in itself, but it adds reflected light to the entrance hall through the glass panelled door of the living-room. The low table in front of the mirror, the Empire watch clock and the reflected ornaments add to the charm of the view of the room from the hall.

LOACH. The loach, sometimes called the stone-loach, is a fresh-water fish. It has a delicate flavour, and is not unlike the gudgeon in shape. Loach is best stewed like carp (q.v.)

LOAM. This, generally speaking, is soil consisting of a mixture of clay, sand, and silt. Loams vary considerably in the proportions of their constituents, and according to their texture they are classed as heavy (clay predominating), medium, and light. For garden purposes, the term loam is regarded as applying to the top three or four inches of soil taken from old pasture land. It is valuable because of its fertility. Fresh loam—that is, still carrying the grass which covered it—can be dug into a flower-bed provided it is buried a full spade-blade deep and grass-side downwards. Otherwise the grass might continue to



grow and eventually appear through the surface of the bed. See Soil.

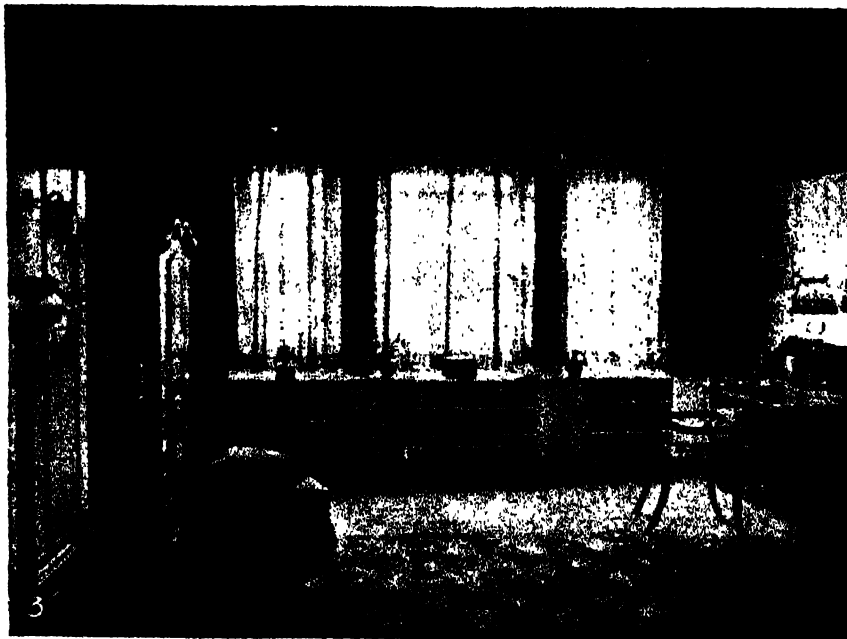
LOAN. A loan may be either of a sum of money or of some article which is to be returned intact. The latter kind of loan is called a bailment in law: the borrower is called a bailee and the lender a bailor of the article. The bailee is bound to take as much care of any article lent to him as a careful man would take of his own goods; if he does not

do so and the article is lost or damaged, the bailee is liable to repay the loss to his bailor.

Usually no loan carries interest unless interest is agreed upon. If A agrees to lend B a sum of money and fails to lend it, B cannot bring an action for breach of contract, because he has in the eye of the law suffered no damage. A moneylender must carry out all loan transactions in his registered name at his registered office and on a special form of contract, and not otherwise. The contract must show the date of the loan, the amount of the principal and the rate of interest per cent per annum, and must be signed by the borrower. A copy must be sent to the borrower within seven days. If he transgresses this rule, the moneylender cannot recover his loan in court. See Building Society; Debt; Mortgage.

LOASA. Most of the genus group of half-hardy S. American plants are annuals. The seed should be sown indoors in February, and, after once transplanting, the seedlings may be placed out of doors in June. The chief kinds are hispida, 12 inches, yellow, and lateritia, climbing, red. The last-named is known as the Chili nettle, because of its stinging hairs.

LOBELIA. The most popular forms of lobelia, which are half-hardy garden plants, are those used for edgings to beds and borders. They are often grown as annuals from seeds sown early in spring, in well-sifted mould, with a liberal mixture of fine sand, and kept in a temperature of from 65° to 70°. The seedlings should be planted out in shallow boxes, 2 in. apart, and hardened off in a cold frame.



Living-room: three views of a modern example. Fig. 2. A delightfully planned window treatment provides plenty of light and excellent shelf accommodation for books. Fig. 4. The tiled fireplace surround and slightly raised hearth are balanced in design by the charming arrangement of the mantel-piece and pictures. Fig. 5. The mirrored corner of the room, highly decorative in itself, is cleverly designed to give light to the hall through the glass door of the living-room.

Illustrations by J. G. A. J. J.

Lobelias treated in this manner may be planted out early in June. Old plants, if lifted and potted in autumn and kept in a heated glass-house, will provide cuttings in early spring.

The herbaceous lobelias are handsome border plants, 2-3 feet high, which bloom in late summer. They are not very hardy, and in most districts must be lifted in October and stored under glass in boxes of light soil for the winter; they will provide cuttings in April, and may be planted out of doors in May. Fulgens and its variety Queen Victoria with bronze leaves and scarlet flowers are very showy. Of the latest novelties the scarlet-flowered Huntman is splendid. *Lobelia siphilitica* has given rise to a race of plants with flowers of many colours—purple, rose, mauve, etc.; these need similar treatment to the varieties of *Lobelia fulgens*.

LOBSTER: How to Cook. It is best as a rule to buy lobsters alive, choosing those which are heavy in proportion to their size and rejecting any which have incrustations on their shells or are light and watery. The flesh of the hen lobster is inferior to that of the male, but the spawn is useful for colouring sauces, etc. The hen may be distinguished from the male lobster by its broad tail and fewer claws.

To kill a lobster, pierce the spinal cord with a skewer or a sharp knife at the joint between the body and tail shells. The fish is cooked in a pan of boiling salted water for 20 to 45 min., according to size. If lobsters are bought ready cooked, their tails, should they be fresh, will spring back when straightened.

A good brand of tinned lobster can be used for made-up dishes or for salads when fresh lobster is unobtainable.

A boiled lobster may be dressed when cold by removing the two largest claws and cracking them, separating the head portion from the tail and splitting both down the middle. Take out the intestine, the stomach and the spongy-looking gills and serve the lobster on a dish with the head in an upright position and the claws and tail placed round it. Salad may be used as a garnish, and oil and vinegar served separately.

To roast a lobster, cut it lengthwise through the middle, removing the intestines, etc., and place the pieces flesh side uppermost in a roasting tin in a hot oven. Cook the fish for about $\frac{1}{2}$ hour. Baste it with melted butter and season it. Garnish with slices of lemon and a few sprigs of parsley. Lobster that is to be broiled is prepared in the same way, but is cooked over the fire. The pieces are basted as for roasting, and turned once. Melted butter sauce is served with it.

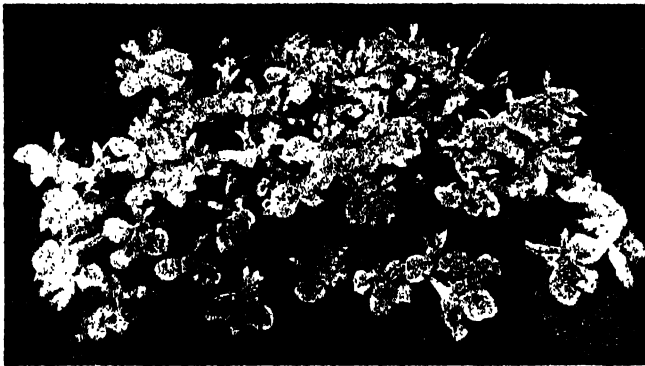
Scalloped lobster is prepared by cutting the flesh of a boiled lobster into small pieces, mixing it with melted butter sauce and turning the mixture into greased scallop shells. Sprinkle some fine breadcrumbs over them, and bake them in the oven until they are lightly browned.

To devil lobster, the flesh is first finely chopped. It is then placed in a saucepan over gentle heat with a little savoury white sauce, a dessertspoonful of mustard, and pepper and salt to taste. These should all be made piping hot, and the devilled lobster served piled on hot buttered toast.

The following recipes are of various appetizing savoury or luncheon dishes which can be

made up from cooked lobster. Such dishes are also useful for buffet suppers, and when nicely garnished present a particularly attractive appearance.

Lobster Bouchée. Lobster bouchées are made by cutting three slices of stale bread about 2 in. thick and then stamping them into



Lobelia. Profusely flowering plant of the Crystal Palace variety

rounds, each measuring 3 in. in diameter. Hollow out the centres, leaving a neat case of bread, and for each cut out a round top or lid. Dip the cases into milk and leave them to drain. Melt 2 oz. butter in a saucepan, stir in smoothly 1 oz. flour, and cook without browning them over the fire for a few minutes. Add $\frac{1}{2}$ pint milk or fish stock, stir until it boils, and then put in a few drops of lemon juice, and nutmeg and seasoning. Let the sauce cool slightly at the side of the fire before adding the beaten yolk of an egg, a breakfastcupful chopped lobster meat, and 2 teaspoonfuls anchovy essence. Stir the mixture over the fire for a few minutes to cook the egg, then

brush the cases and lids of bread with some beaten egg and coat them with breadcrumbs. Fry them a golden brown, and drain.

Fill each case with the lobster mixture, heaping it up slightly, put on the lid, and stick one or two pieces of lobster taster in the top to give a decorative effect. These bouchées may be served either hot or cold.

Lobster Butter. This is a savoury butter made either from lobster spawn or coral. If the former is used, cook it in salted water until it assumes a bright red hue; then drain and dry it and pound it in a mortar with twice its quantity of butter. Finally rub it through a hair sieve. When lobster coral is used the process is the same, except that the coral is merely washed and then dried in a cool oven.

Lobster Cream. Small lobster creams are made by pounding the flesh of half an average-sized lobster with $\frac{1}{2}$ gill sauce, rubbing the mixture through a sieve, and then adding $\frac{1}{2}$ teaspoonful of anchovy essence, a little lemon juice and a small pinch of cayenne. Beat these ingredients together, adding $\frac{1}{2}$ gill whipped cream, and then turn the mixture into some small china cases. Whip another $\frac{1}{2}$ gill cream, put a little on the top of each, and then garnish with a little pounded coral of lobster rubbed through a sieve. The creams should be left to stand on ice before being served.

Lobster Cutlet. To prepare this dish, melt 1 oz. butter in a saucepan, stir in 1 oz. flour, and add a gill of water. Stir the mixture till it leaves the sides of the pan, add a small tin of lobster, finely chopped, and seasoning. Mix well, and spread in a plate to cool; then turn it on to a floured board. Shape it into cutlets, brush these over with beaten egg and coat them with breadcrumbs, and fry them. They should be served with salad if cold, or, if hot, with fried parsley and lemon. See Hors d'Oeuvres; Mayonnaise; Salad.

LOCKS: HOW TO FIT AND REPAIR

With Simple Instructions for Cutting Keys

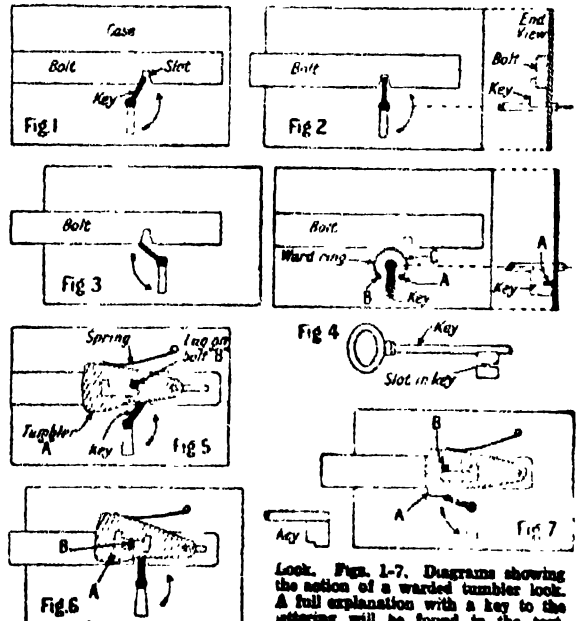
This contribution describes the mechanism of the chief types of lock and gives directions for fitting them to door, lid, or drawer. The process of cutting keys is clearly explained and fully illustrated. See further the articles Bolt; Latch; Padlock; Safe.

In the home a lock is usually a piece of mechanism by which doors, drawers, or lids are secured so that they can only be opened with a key made to fit the lock. The three main types are warded, lever and pin tumbler locks, each comprising the mechanism in a case, a sliding bolt, and the key. In some types the lock is operated from the outside only; in others from either side.

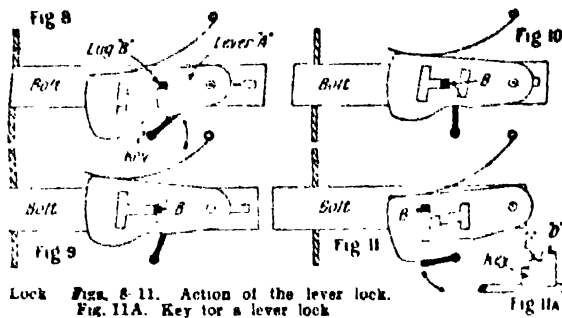
A drawback lock can be opened from the inside by sliding a knob; and with a letter lock, or combination lock, the locking is effected by moving two or more disks or their equivalent; the disks are marked with letters or numerals, and when the proper ones are opposite each other the lock can be opened, but in no other manner. The disks have a notch out in the rim, and only when these notches are in line can the lock bolt be released, the large number of possible combinations rendering it difficult to open the lock unless the proper combination is known. This type of lock is available from the cheapest qualities to elaborate devices for a strong-room door or safe.

Warded Tumbler Locks. Figs. 1-7 illustrate the action of a warded tumbler lock. The bolt is shown in Fig. 1 as

sliding in the case. The key is inserted in the keyhole and touches the edge of a notch which is cut in the bolt. As the key is turned in the direction of the arrow it presses the bolt outwards, as illustrated in Fig. 2. The key must be long enough to reach nearly to the top of the slot, but not too long, or it will



Lock. Figs. 1-7. Diagrams showing the action of a warded tumbler lock. A full explanation with a key to the lettering will be found in the text.



Lock Figs. 8-11. Action of the lever lock.
Fig. 11A. Key for a lever lock

not turn further, as it must do to release the key on the other side of the keyhole line, as shown in Fig. 3. From this position the key is turned until it can be pulled out of the keyhole.

Two points are now apparent. There is nothing to prevent the bolt being pushed in or out without the aid of a key, and any key that will pass the keyhole will actuate the bolt, so long as it can pass the top of the slot in the bolt. Wards are therefore introduced to prevent the key from turning unless it has an aperture to allow it to pass the wards

too much, and the lug will engage in the lower of the notches in the lever, consequently the bolt could not be shot. Most good lever locks have three or more levers; the slots are made at varying distances from the part of the lever resting on the key, and the levers all have to be lifted simultaneously to such heights that all the slots are in line before the lug can pass and the bolt be shot. For this reason the lever lock is one of the most secure of the ordinary domestic locks.

Pin Tumbler Locks. The pin tumbler system works on an altogether different principle. As can be seen from Fig. 12, it comprises a body with a cylindrical hole, wherein turns a cylinder of metal, into which the key is inserted, the key slot being usually corrugated. Attached to the cylinder is a connecting bar (not shown) which

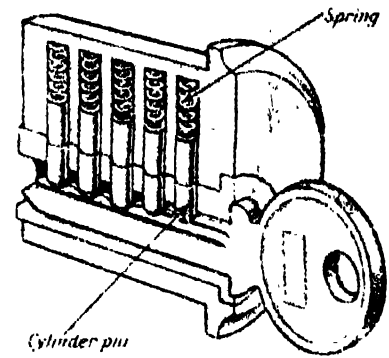
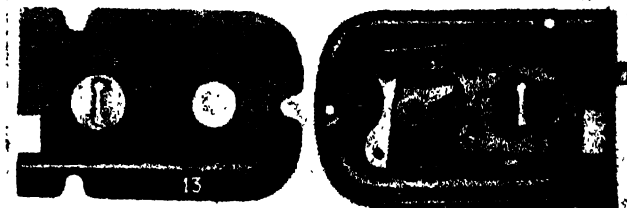


Fig. 12. Pin tumbler lock, cylinder mechanism

coiled springs. The top edge of the key is notched to varying depths, and as it is inserted into the slot it raises the pins. A key suitably notched for the particular lock will raise each of the cylinder pins so that it is just level with the joint between cylinder and body. When the key is fully home all the pins are in line and level with the joint, consequently the key can be turned.

Fitting a Rim Lock. Door locks are made either right or left hand. When purchasing the lock should be held in the hand with the bolt to that side which it will occupy when in place. Then see that the keyhole is the right way round, and that the lock can be fitted to the door. Many locks are made reversible to suit any door. Fig. 13 shows the rim lock, a type which is easily fixed on the outside of a door. The first thing to be done is to mark out the door and sink the flange of the lock plate into the edge of the door by chiselling away the surplus wood. Having done this, hold the lock in position and carefully mark the position of the keyhole and the spindle hole with a bradawl on the face of the door. As nearly as possible the size of the bits for boring the holes for the keyhole and the spindle should be equal to the size of the keyhole in the lock plate and the diameter of the spindle. The lock is screwed on with round headed screws, flat headed screws being used for the cover plate.

The spindle knobs and escutcheon plate are placed in position, the last named fixed with escutcheon pins. The box staple may be set



This is shown in Fig. 4, where two pins, A, B, prevent the key from turning unless cut away as shown. In place of the pins a circular ward plate or ring is fitted, as at C, Fig. 4.

To prevent the bolt from being moved

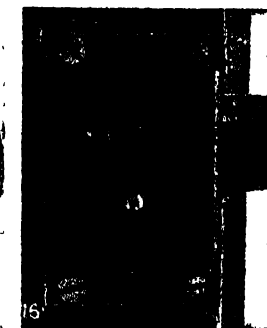
except by the key, another piece of apparatus is added. This is a tumbler, a flat plate of metal hinged at one end to a peg, as shown at A, Fig. 5, and pressed down by a light spring. It is generally placed in front of the bolt, with its lower edge in line with that of the bolt. A U-shaped slot is cut through the tumbler, and a peg or lug, B, is fitted to the bolt, so that when the bolt is in, the lug rests in the inner end of the leg of the tumbler slot, as at Fig. 5.

When the key is turned, it shoots the bolt as before, and, at the same time, it raises the tumbler from its starting position to the elevation, as in Fig. 6, thus bringing the slot in the tumbler in line with the lug in the bolt. This allows the lug to pass, but when the key has been further turned the tumbler falls and the bolt lug is then in the outer leg of the tumbler slot, as in Fig. 7. The tumbler holds the lug, and so prevents the bolt from being forced back.

Lever Locks. In lever locks the bolt is secured differently, and there is often a "follower," which takes the bolt with it. In Fig. 8 the lever A is shown "down" and the bolt lug B is in the inner end of the slot in the lever. The key has to raise the lever until the central slot is in line with the lug, and no more,

shoots the bolt when the cylinder is turned. The key turns the cylinder and raises the locking pins. These pins are small pieces of steel rod that rise and fall in holes drilled in the two parts of the mechanism, as shown in Fig. 12.

One set of pins, of varying length, is located in the cylinder and another set in the body, the latter pressed down towards the cylinder by the little



Lock. Fig. 13. Cover and interior view of rim lock. Fig. 14. Mortise lock with cover removed. Fig. 15. Fitting mortise lock into door. Fig. 16. Simple upboard lock, screwed in place. Fig. 17. Drawer or cabinet lock, showing cover and screws employed to fix it. Fig. 18. Cutting the recess for a drawer lock

in the door frame, or on a block. The lock is tested by shutting the door gently, when the bolt should shoot into the staple with a decided action and a perceptible click. There ought to be just sufficient room for the door to clear the front edge of the staple, and not too much space between the lock case and the staple when the door is shut, or the bolt may be forced open if the door is subjected to pressure.

Mortise Lock. Fig. 14 shows a type of lock which is almost invisible when fitted, being mortised in the door. It is widely used,



Lock. Fig. 19. Showing method of fitting pin tumbler lock

although the deep mortise greatly weakens the door. Locks of various shapes have been put on the market to obviate this defect; some circular in section, others constructed with a narrow case, so that a true mortise is required for their fitting. The door is first marked out and the centres of the spindle hole and keyhole marked and drilled. The mortise is carefully cut in the ordinary way, the lock flange being recessed into the edge of the door, as shown in Fig. 15, and the lock secured with countersunk screws. A striking plate takes the place of the staple and is recessed into the edge of the frame. The holes for the lock bolts are drilled out and squared in with a chisel and must be deep enough to allow the bolt to enter. When the plate is in line, and the bolts enter the holes properly, the plate is fixed in place with countersunk screws. The joiner uses a special long-shanked chisel with a hooked blade to cut the mortise in door (Fig. 20).

Fitting Pin Tumbler Locks.

Fitting this type of lock is similar to a rim lock, with the addition of a hole which has to be drilled through the door for the passage of the lock body, which is held in place by two long screws passed through the door from the back, prior to fixing the lock case. A specially shaped washer plate is supplied to bear against the woodwork, which, by aid of the screws, clamps the lock body to the door (Fig. 19).

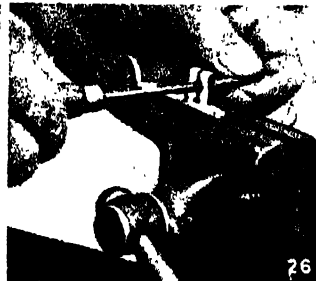
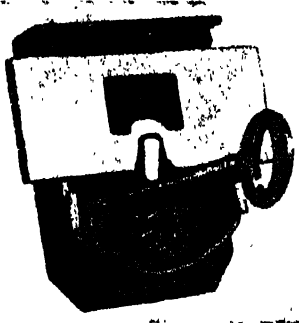
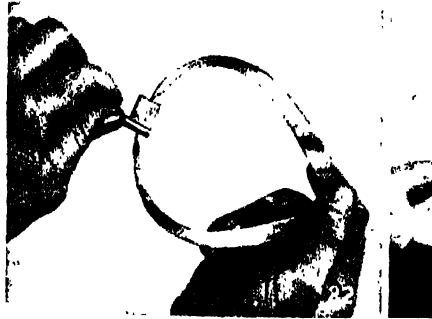
Cabinet Locks. Iron cupboard locks seen in Fig. 16 are used for the doors of meat



Fig. 20. Special tools used in lock fitting. Above, long-shanked mortise chisel with hooked blade; below, drawer lock chisel

safes, presses, hot closets, and various other fittings about the house. Smaller locks (Fig. 17) such as are required for cabinets, wardrobes, chests of drawers, and other articles, are usually of brass. Their one drawback is that the bolt is very short, so that it can be pushed back and the door opened without much difficulty; extra long bolts, however, may be obtained. Cabinet locks are made in warded and lever types, the non being warded, while the brass are lever. Some keys have a solid pin others are hollow.

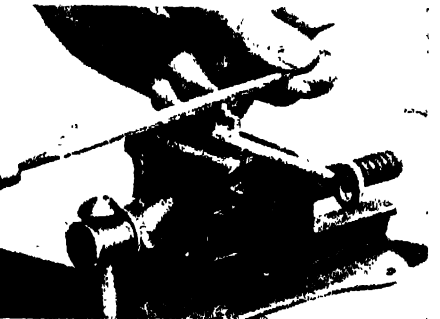
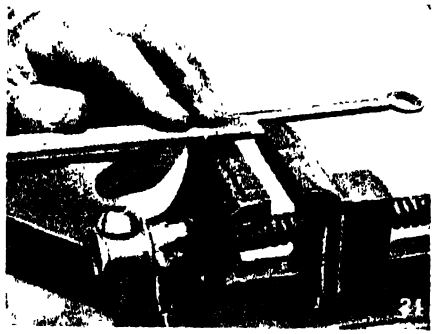
The fitting of a drawer or till lock is a simple operation, the first thing being to mark the exact centre of the front of the drawer. A recess is cut out at the back to the size of the lock case and flange by means of a fine saw and a chisel. There is a special tool made for the purpose, known as a drawer lock chisel (Fig. 20). When the correct fit has been obtained, as shown in Fig. 18, the position of the



Lock. Stages in Key Cutting. Fig. 21. Filing the blank to correct thickness. Fig. 22. Testing with calipers, to ascertain size of blank. Fig. 23. Cutting the blank to actuate the various levers. Fig. 24. How key should fit a simple lock. Fig. 25. Warded key cut to clear ward ring and shown lifting tumbler. Fig. 26. How internal slots are cut in a key for a warded lock. Fig. 27. Pipe type of key, showing alteration to same to render lock more secure

keyhole should be carefully ascertained and cut out with a bit and a keyhole saw, or a key chisel. The lock is then screwed into place. The bolt hole in the top rail of the drawer is next made. Its correct position is ascertained by placing a little black lead on the top of the bolt, pushing the drawer into the proper position, and turning the key so as to force the bolt on to the surface of the top rail of the drawer. If this is done several times, the shape and position for the bolt hole is clearly shown. The bolt hole may then be chiselled out to the requisite depth.

Box locks are fitted in much the same way, but the top plate carrying the lug with which



the bolts engage, has to be fitted to the lid. This operation is easily performed when the link plate has pegs or spikes formed on the upper side, as the lock is first fitted, the link plate inserted in the lock, and the lid shut down hard on to the link. The pins hold the link, and when the lock is unbolted the lid is raised with the link in position. The recess is then marked and cut, and the link plate secured with screws.

Padilocks are in a class by themselves, as they require no fitting; they pass through a staple or any place that is to be locked, as, for example, the wheel of a bicycle to the front forks. Varieties are made with lever, tumbler, and pin tumbler mechanism, as well as simple letter mechanism. Others have a spring-back bolt that is self-locking. Where security is of importance it is a mistake to buy cheap padlocks. For an outside door a type with a short stout shackle should be chosen, as this is difficult to force, and the thick shackle would take some time to sever with a saw. It should be locked through a stout staple over a hasp. If a chain has to be used, its links should be thick enough to offer at least as much resistance as the shackle or staples. For outside use all fastenings should be as strong as possible.

When locks require to be repaired, the chief items are the replacement of broken springs, renewal of damaged pins, and rebushing of spindle holes. Most ironmongers stock a selection of springs, and their replacement involves nothing more than slipping into a notch, or refixing with a screw or rivet, according to the nature of the construction. Worn bushings can be replaced with new, or the hole can be enlarged and bushed with a ring of brass

tubing soldered in place and the faces cleaned up true with a file.

Locks should be oiled occasionally, since this assists the smoothness of action and prolongs their life. The old-fashioned method of using a leather dipped in oil is useful for a simple plate or stock lock, but the only way of oiling the modern types of rim and mortise locks is to take them out and unscrew the back-plate in order to lubricate the whole of the parts. Locks should always be properly oiled before fitting.

Key Cutting and Fitting. The first requirement in key cutting is to understand something of the lock the key is to actuate, and the way in which it works. The description of the types of lock in the foregoing pages should be studied, and the lock itself examined.

As a first attempt, suppose a key is to be fitted to an ordinary rim lock of the lever type; this may be dealt with on the following lines. First of all a blank must be procured from the ironmonger; a blank is a solid uncut key, and should be obtained as nearly the correct size and shape as possible. See also that the shank of the key is long enough for the door to which it is to be fitted, so that the bow can turn on the outside. In the case of a lever lock the key has first to lift the levers, and then to throw back the follower, which takes back the bolt with it. Therefore the next step is to file the blank to such a size that it will enter the keyhole and set against the back-plate or back part of the lock case. This is accomplished by grasping the key in a vice with the blank to the left and the shank gripped in the vice jaws.

The top of the blank is then filed down, keeping it perfectly level at the top until it will just enter the keyhole. See that the pin or the holes in the lock-case do not stop the key from entering, and that the blank is not too thick; in either of these cases the blank must be carefully filed to fit (Fig. 21). The use of a pair of calipers (Fig. 22) will be found a great assistance in the progress of the work, as they can be used to test the thickness of the blank and the height from the shank to the top of the blank.

It will facilitate matters if the lock be removed from the door and be taken to pieces, as the action can then be seen and appreciated, as is clearly shown in Figs 13, 14, 25, etc.

The key is first fitted to the follower as described, and then the master lever found by inspection; it can be detected, as it is the one with the slot nearest to the lower edge of the lever. The end of the blank has then to be filed down at the spot exactly opposite this lever until it will raise the lever the required amount; the other levers may be removed while this is in progress (Fig. 23).

Each lever is treated in the same way, and the series of steps thus produced on the blank are touched up here and there until the whole of the levers lift properly and the follower throws back nicely. The action should be perfect in either direction, shooting the bolt in or out with equal facility. The width of the blank may be such that it will have to be filed back or made narrower to allow it to turn when the cover-plate is replaced; but this is an easy matter, the main thing is to remove a little metal at a time from the blank, when the result of so doing can be seen and appreciated.

The usual files for this work are the thin warding files sold in many sizes; some thick and some thin ones should be obtained. They

are used in the manner shown in the illustrations, which also show progressive stages in the fitting of a key to a lock.

A warded key is cut on similar lines, but it may be noted that the blank can often be obtained with a number of the wards already cut, thereby reducing the amount of time and labour in fitting the key to the lock. In this case the key has to be cut away until it can be turned in the lock, as it will then throw back the follower and shoot the bolt, so all that has to be done is to file away the parts of the blank that obstruct the free turning of the key (Fig. 25).

A duplicate key can be cut by careful calipering and comparing with the original. When the lock is accessible a film of tallow or beeswax may be applied to the blank, so that when the key is pressed against the wards they will leave a mark on the blank, and thus indicate the parts to be cut away. It is always wise to proceed slowly, and to try the key in the lock several times to note the progress of the work.

Keys for the pin tumbler type of lock are perhaps best entrusted to the locksmith, who has a special appliance for the purpose. The pattern key is clamped in the machine, and the blank is automatically cut to the same notching by a grinding wheel of the proper shape and action.

A device to render a key, and therefore a lock, more difficult to copy is to cut off a piece of the pipe or hole in the key of a pin type of key, and to fix the piece on the peg in the lock, securing it with a touch of solder (Fig. 27). Similarly, a pin can be fitted to the lock-case in those types of lock in which the key turns on a peg. It is necessary to cut back and drill out the keys to fit on to the peg, but it is then more difficult to place the key in the lock.

When several or a number of locks are ordered at the same time, it is possible to arrange for a master key to be cut which will unlock all or any of them, each having, of course, its own individual key. This method is commonly adopted in hotels, boarding-houses, etc. A skeleton key is one in which the major portion of the blank has been cut

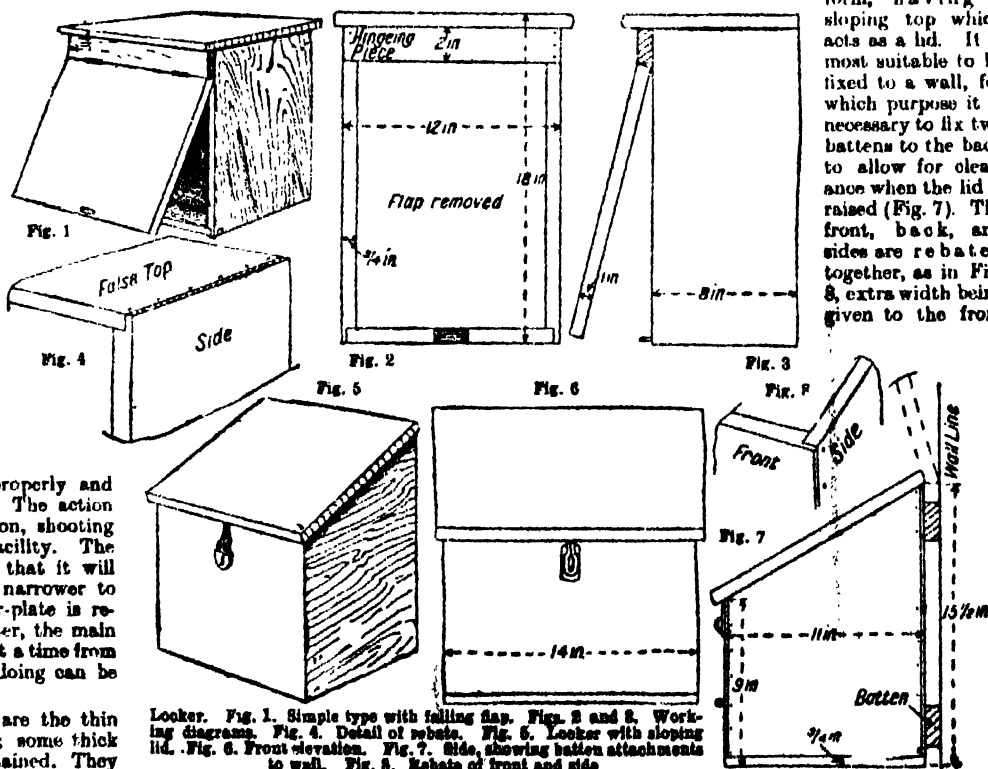
away to clear the wards, and is thus easily able to open the lock, as there is no metal in the blank to obstruct the turning of the key, the only requirement then being that the height of the blank be sufficient to throw over the follower. But skeleton keys are useless against a good type of lever lock, as all the levers have to be raised to different heights; the use of picks made of thin, stiff wire is resorted to by the locksmith when a key has been lost. Most good-class locks are, however, made with safety devices that render them almost proof against picking.

LOCKER. There are many uses for lockers in the home, either as internal fittings or as receptacles for holding odds and ends. They are often provided with falling flaps, but these are only suitable when they are not more than 4 ft. or so above the ground level. The lower shelves of those filling a recess can be divided off and fitted with flaps with turn-buckles or locks; they provide good storing space, and may often save building a cupboard.

Fig. 1 shows an example of a simple locker with a falling flap secured with a padlock and staple, the whole, excepting the flap and hinging piece, being of $\frac{1}{2}$ in. deal. First prepare the two ends to size and cut and rebate them at each end deep enough to take the false top and the bottom. The two latter are then cut out, and in length should equal the width of the job less the thickness of the projections formed by the rebates on the ends, as is shown in Fig. 4.

Glue and nail the job together, and nail on a back, 3-ply being the best stuff to use. The hinging piece is nailed on to the front, as in Figs. 2 and 3, and must be of the same thickness as the flap. The latter may be of one piece, strengthened on the inside with battens, or for a better job may be clamped. It is hinged with ordinary brass or iron butts, and a hole cut at the bottom to allow the staple to pass through. It is better to fix this first, so that the position at which to cut the hole will be automatically marked. The top is fixed by nailing down from the top, or in another method may be screwed from the inside through the false top. Fig. 5 is another

form, having a sloping top which acts as a lid. It is most suitable to be fixed to a wall, for which purpose it is necessary to fix two battens to the back to allow for clearance when the lid is raised (Fig. 7). The front, back, and sides are rebated together, as in Fig. 8, extra width being given to the front



Locker. Fig. 1. Simple type with falling flap. Figs. 2 and 3. Working diagrams. Fig. 4. Detail of rebates. Fig. 5. Locker with sloping lid. Fig. 6. Front elevation. Fig. 7. Side, showing batten attachments to wall. Fig. 8. Rebate of front and side.

to allow for its being bevelled off at the top at the same angle as the sides. It is easier to bevel it after assembly. The bottom is nailed or screwed on from underneath.

LOCKJAW. The cause of lockjaw, also called tetanus, is a microbe, the bacillus of tetanus, which is introduced into the body through some wound or cut in the skin, and produces a virulent poison. It is found in garden soil, stable sweepings and dust.

The first symptoms may be headache or languor, the muscles of the neck become stiff, then those of the jaw, and the jaws become fixed or locked. The face becomes fixed, and the corners of the mouth are drawn back. There are spasms of the body and legs.

In any event, where there is stiffness of the muscles in the neighbourhood of a wound, or of the jaws and neck, the doctor should be sent for, and in the meantime the patient should be given a warm bath and put to bed. Rest and quietness are of the utmost importance. The patient when in bed must not

face the window. Draw the curtains, put a thick carpet on the floor, oil the door-lock and hinges, and remove all creaky chairs. Avoid any sudden noise, such as the banging of doors. Do not let the patient speak unless it is absolutely necessary. Cover artificial lights with a blue shade, and keep the light, natural or artificial, always dim.

The diet must be nutritious and fluid. The food must be given slowly, and with the greatest gentleness, to avoid causing a convulsion.

LOCK NUT. A lock nut is an ordinary nut used to check, or lock, another nut which is screwed on to the same bolt, and prevent its further progress. For example, if a bolt is to be screwed a certain exact distance into a hole a nut is placed on it, and when the bolt has reached the required position the nut is screwed up tight, thus locking the bolt in position. Sometimes two nuts are screwed on a bolt together, the lock nut holding the first in position.

LOCOMOTIVE: BUILDING A SCALE MODEL

How to Construct a Steam Engine from Prepared Parts

This powerful gauge O locomotive is built from a kit of standard parts and is easy to assemble with a few elementary tools by the unskilled amateur. Other articles dealing with model-making are: Boat, Engine, Electric Motor, Railway, Yacht.

The model locomotive "Enterprise" described in this article is built from finished standard parts obtained from Messrs. Bassett-Lowke, Ltd., Northampton. All parts are to scale, and are referred to in the text by the numbers on the accompanying photograph and plan, Figs. 2 and 3.

Water is heated by a methylated spirit lamp between the frames. The fuel capacity of the lamp is such that the lamp goes out before all the water in the boiler has been turned into steam, so preventing damage to the boiler.

To assemble, take the loco underframe (8), complete with screw and nut, which is ready bored to receive two axles (13 and 14). Air holes are slotted, three in each side. Cylinder brackets, one each side, are ready for mounting cylinders. Forward part of under frame is cut away to allow bogie (6) to move sideways when negotiating curves. Slots are also provided to allow inlet pipes (10) to connect cylinders (9). The forward plate spacing the frame sides is slotted to allow the eccentric rods (17) to pass through from the driving axle (13).

Place left-hand cylinder on cylinder bracket, at the same time sliding an eccentric rod in position with the small end-hole over the peg in the valve spindle, horizontal surface uppermost, the big end or loop pointing downwards. The exhaust port faces inwards, and the steam pipe connection slides into the cut away on the underside of valve chest. Now take the left-hand cylinder lagging (9), place underneath cylinder bracket, and pass the two fixing screws through the holes in the lagging and cylinder bracket, and screw into the valve chest. The procedure is repeated for the right-hand cylinder.

Next take the pair of exhaust pipes (11), placing them into their respective exhaust ports facing inwards opposite each other, and when in position point upwards at right angles to the frame, ready for the smoke-box hole through the boiler to slide over the ends.

Remove the screw and nut which passes through the tie bar at the front of the frame. This screw holds the footplate securely and also

the anchors for the front coupling. Place into position the footplate (1) with edging boiler saddle and bogie stud complete. The six lugs on the frame fit into the slots in the footplate. The free edges of the cylinder lagging are secured by trapping them inside the flange of the footplate, so care must be taken to guide the edges of the lagging as the footplate is lowered on to the frame.

The complete boiler (2), is fitted after the whistle (18) has been screwed into position next to the long brass plug on the fire door end.

The part of the whistle protruding through the hole in the cab is removed to allow the cab (3) to pass over the end of the boiler.

On account of the steam pipe connection being already shaped and fitted to the boiler,

are bridged by the small inlet pipe, leaving only the opening in the inlet pipe to be soldered, when the boiler with main steam pipe attached is put into position.

Lower the footplate on to the frame, and secure with the six lugs. The screw which carries the front coupling is then screwed into position, after which solder the remaining connexion between the boiler pipe and inlet pipe. Next solder the cab lugs and the underside of the footplate where the cab lugs pass through the slot, the base of the cab sides and edges of footplate, the sides of the boiler and the spectacle plates of the cab; and the boiler saddle and boiler sides at point of rest on the saddle.

The soldering point of the lamp retainer is on the right-hand side of the footplate, next to the tender coupling. Care must be taken to solder the sleeve on the wire only to the footplate, leaving the wire free to revolve within. The whistle is then screwed into the whistle body.

The locomotive is now ready for fitting the four driving wheels, the axles and the coupling and connecting rods. The forward driving axle (13) carries the slip eccentrics, two thin brass washers, two slotted wheel retaining nuts, and two shaped key pieces. The rear driving axle (14) is the same but without eccentrics. The wheels are held on the axles by the shaped keys fitting the squared portion, and finally locked by the slotted nuts screwed on to the threaded ends.

The wheels have simple cranks and pins. The forward pair have short pins to carry the coupling rods, whilst the second pair have longer crank pins, carrying both rear ends of coupling rods, and the big ends of the connecting rods separated by spacers. Wheel hubs are drilled to accommodate the key pieces and retaining nuts.

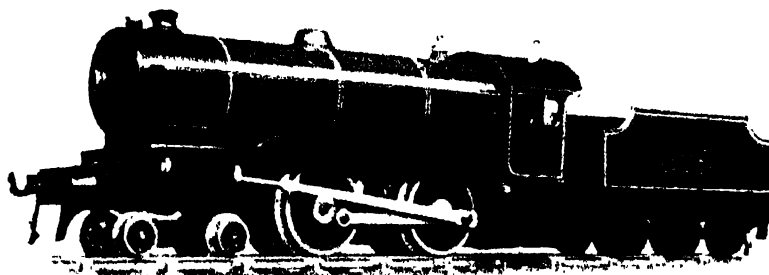
File the points of the axle ends as far as the threads. Place one end of the forward axle through the hole in the underframe, so that it protrudes sufficiently on the inside to allow one eccentric to be slipped on and worked into position with the eccentric rod (17).

The slip portion of the eccentric follows, carrying the locking screw to the axle. Push the axle through a little further, slip on the second locking portion and eccentric, then through the frame on the opposite side. The axle now extends through the frame on either side just sufficiently to take a thin brass washer between the frame and the wheel. Close the eccentrics up on either side of the axle, and temporarily lock in position by screwing to the axle.

Next take a forward driving wheel with a short crank pin and insert a brass key piece. The wheel should now be worked on to the axle with the thin brass washer previously mentioned in between wheel and underframe until the squared portion of the axle comes with the square of the key piece. The slotted retaining nut is then screwed on the axle end and made firm.

The remaining forward driver is fitted similarly, with the crank at right angles to the first. The cranks are off-set so that one side is about to take up the drive as the other terminates.

The rear axle and drivers are assembled likewise, except that there are no eccentrics. Cranks are off-set at right angles, but correspond to the relative positions of the forward cranks. If the two drivers on the right-hand side are at top centre, then those on the left



Locomotive. Fig. 1. Scale model of a steam-driven 4-4-0 railway engine which can be built from a set of standard parts as described in text. The parts and their positions are illustrated in the next page.

it will be necessary to place the end of the pipe, with the boiler at right angles to the footplate, and slightly tilted forward, down through the frame, at the same time swinging the boiler round, guiding the ends of the two exhaust pipes into the smoke-stack hole on the underside of the boiler.

Now turn the model over and place into position the small inlet pipe (10) which joins the two valve chests together, with a hole left for the remaining connection to the steam pipe from the boiler.

The boiler, cab and footplate are temporarily removed, leaving the exhaust pipes in position ready for soldering.

Solder the two "L" shaped exhaust pipes (11) to the exhaust ports of the cylinder so that the pipes will pass into the chimney when the boiler and cab are lowered over them. Then solder the two inlet ports together which

will be in line with the wheel centres and coupling rods.

All that now remains is the addition of the coupling and connecting rods to the crank pins, and adjustment of the slip eccentrics. Unscrew the forward or short crank pin and slide on a coupling rod with small washer next to the crank. On the rear or long crank pin connect first the coupling rod with small washer next to crank, followed by spacer and big end of connecting rod. Screw and make firm both crank pins. The little end of connecting rod is now connected to the piston rod crosshead by first removing tiny screw and replacing through connecting rod. The opposite side is fitted the same way.

With the left hand cranks on top centre, turn model over, and revolve the left hand slip eccentric which is now furthest away until the locking screw is on top, and the peg of the eccentric directly opposite or 180° on the underside. This corresponds with the stationary position of the locomotive. Make

of footplate is recognised by the hole for the coupling rivet $\frac{1}{2}$ inch from end, whilst the rivet hole $1\frac{1}{4}$ inches from front is for the tender link. Place in position the underframe (20), and insert rivets through both footplate and underframe, and make fast coupling (28) and link (27) by hammering over the rivets.

The six axle boxes (21) are clipped to the underframe by three lugs. The axles with wheels are sprung into position, the middle one first. All that is necessary now is to position the top (23) and coalplate (24), by the four lugs on each side. Insert buffers (29) through buffer holes.

After painting and lining in the colours preferred, the locomotive is ready for running. Fill the lamp with methylated spirit until the level hole is reached, then replace the small screw on the left hand side of container. Wait until the wicks are quite damp before lighting, otherwise they will not burn correctly. Fill up the oil lubricator through screw hole in front of chimney on top of boiler, until oil

begins to flow through the hole or level in centre of smoke box front, then replace both screws firmly.

The boiler is filled with cold water through funnel (32) by way of the safety valve hole until the water overflows at the long brass plug hole on the end of boiler inside the cab. The safety valve and long brass plug must be replaced firmly to avoid loss of pressure.

When the full pressure is reached, and the safety valve blows, rotate the wheels a few turns, being careful not to allow the wheels complete freedom to race. This will clear the cylinders of oil and condensed steam. The engine should run for about 1½ hours on one filling of boiler and lamp.

LOCOMOTOR ATAXIA. A chronic disease of the spinal cord, most common in males. It may be due to alcoholism, sexual excess, syphilis, or injury to the spinal column.

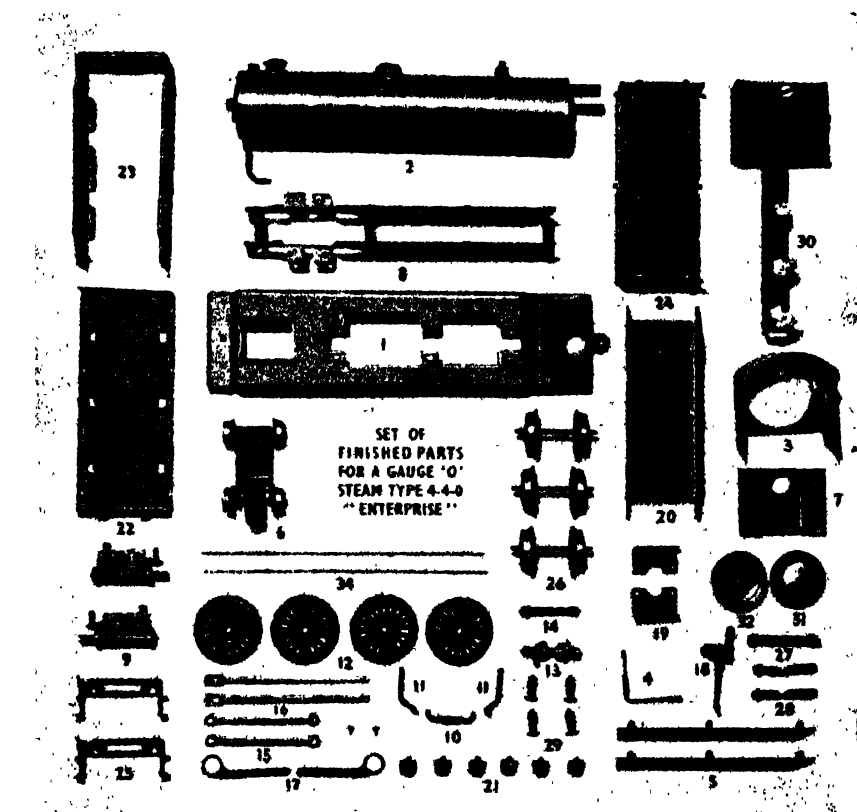
The patient gradually finds that he is very liable to lose his balance unless he watches his feet. Walking becomes more difficult, and the reflexes are completely lost. Two sticks have to be used, and gradually the power of locomotion is lost entirely, together with control of the bladder. In many cases of locomotor ataxia the optic nerve is affected, and total blindness may speedily ensue.

The patient should place himself under a doctor's care at the earliest possible moment.

LODGER. A lodger is a person who hires a room or rooms or part thereof in the house of another. He is in some respects like an ordinary tenant. If he rents a separate room, he goods are liable to be distrained upon by his landlord. His landlord's landlord can, in the first place, distrain upon all goods which he finds in the house, including those of the lodger. But the lodger can recover his goods by giving a notice in writing to the person who makes the distress, containing a list of the goods claimed, and a statement that they are the goods of the lodger, the terms upon which the lodger holds, i.e. weekly, monthly, etc., and at what rent, and also how much rent he owes, if any.

The lodger must pay to his landlord's landlord any rent which is overdue by him. He is then entitled to have his goods redelivered to him, and if the distraining landlord refuses to deliver them, application should be made at the nearest police court. As against his landlord, the lodger is not entitled to any special protection for his goods. He must take care of them himself. But the landlord must not be guilty of negligence, e.g. taking in a servant without a character who turns out to be a convicted thief.

A lodger should always stipulate what notice is to be given to determine the contract, and in

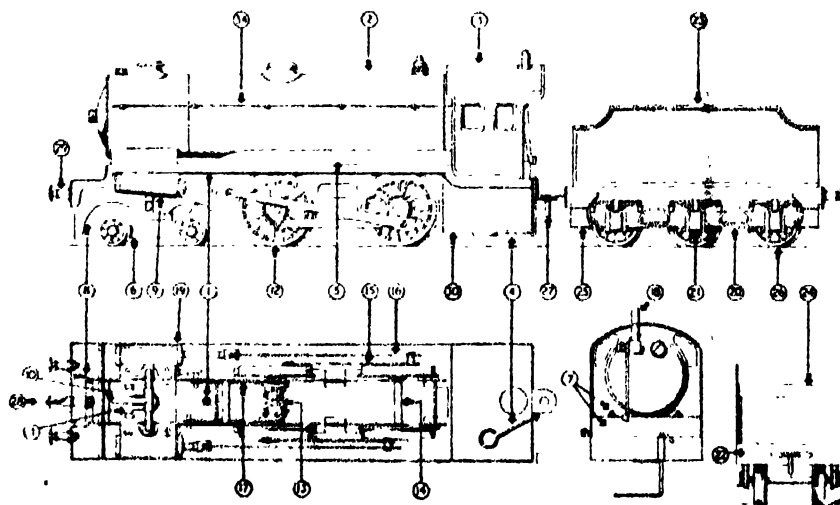


Locomotive. Fig. 2. above. The complete set of parts for building the 4-4-0 steam locomotive described on this and the previous page. The numbers are referred to in the text, and their positions on the finished engine are indicated in Fig. 3, right.

fast the locking screw to the axle. Turn the wheels clockwise 90° or quarter of a complete turn. The right-hand side cranks will now be on top centre facing. Revolve right hand eccentric or nearest until locking screw is on top with eccentric peg directly opposite on the underside, or 180°, and make fast locking screw. Both eccentrics are now correctly adjusted in the centre or stationary position. The bogie (6) is placed on the bogie stud.

To assemble the tender, first attach tender footplate (22) to main tender top (23) by means of the four lugs.

Next take tender footplate and fix tender steps (25) with slots opposite to allow link and coupling to pass through. The rear end



the absence of any express agreement he is entitled to a reasonable notice. As a rule, where rent is payable weekly a week's notice is sufficient, and where payable monthly a month's notice. The notice must expire at the end of a week or month of the tenancy.

A lodger who takes furnished rooms is in exactly the same position as one who holds unfurnished rooms, except that under the Rent Restriction Acts a lodger who takes unfurnished rooms to which the Acts still apply is protected, and cannot be turned out except by an order of the court, which order can only be made for the reasons specified in the Act. A tenant of furnished rooms is not entitled to any protection under this statute; but the lodger, even in unfurnished rooms, who by his contract is entitled to attendance is also outside the protection of the Rent Restriction Acts.

Lodgers, both men and women, are entitled to vote at both parliamentary and municipal elections, a residential qualification being sufficient. See Agreements; Landlord; Tenant.

LODGINGS. When lodgings or furnished rooms are required in a town which the prospective lodger does not know, an inquiry addressed to one of the local newspapers will probably be of assistance. By sending a stamped addressed envelope anyone may learn from the chief clerk of the classified advertising section which of the districts are occupied by the better type of landlady and boarding house. It is then a simple matter to advertise for rooms in one or other of these neighbourhoods, or, preferably, to make inquiries on the spot. Much can generally be learned about the character of individual houses by inquiries at local shops or from a policeman.

There are various types of lodgings, including the bed-sitting room, with or without board, in a private house, or one or more bedrooms and a sitting room where more privacy is secured, at a higher price. Lodgings may be taken in a house where the landlady supplies no meals and has little to do with her tenants. For a man this method may prove rather expensive if he has to buy all his meals outside. For a woman it often solves the problem of economical living away from home, as such rooms are usually provided with a gas-stove or some kind of gas fixture on which meals can be prepared. A third method of many landladies is to let each of the rooms of a large house at a fixed rent with breakfast, the meal being either sent up on a tray or served in the dining room as in an ordinary boarding house.

A person living in rooms should avoid making complaints, whether about food or service, except to the responsible person. Heavy luggage causes trouble to servants and often injury to walls. If a good deal of luggage is necessary, packing can be so arranged that the heaviest trunk may be put in a box-room or basement. Alteration of furnishing arrangements should not be made without the landlady's consent.

Furnished apartments are also of interest to the holiday maker. Prices vary considerably, according to the season of the year, the highest being usually obtained during July and August. Some landladies make a weekly charge, which covers board and lodging, but the majority to the cooking and attendance, leaving the visitors to buy their own food.

Furnished apartments can be obtained by looking down the columns of the local paper or by application to the inquiry bureau which exists at nearly every British seaside resort, usually under the direction of the town clerk or local publicity department. Those requiring apartments, especially in the summer months when schools are on holiday, should book their rooms at least three months ahead.

The letting of apartments as a means of gaining a livelihood is often the only occupation

open to a widow with a family, or to an unmarried woman who has been left with a well-furnished house without sufficient income to run it. A house must be run on sound business principles to pay. Three important aids to success are absolute cleanliness, good cooking and pleasant manners. A well-aired, well-dusted house, creates a good impression without elaborate furniture or expensive decorations. In furnishing rooms a landlady should aim at clean walls, simplicity in the floor-coverings, with stained wood or linoleum surrounds which do not harbour the dust, good lighting suitably placed for reading, a gas-ring and a gas heating fixture where central heating is not in use, convenient bathrooms, and perfect sanitary arrangements.

LOFT. In general a loft means an upper room, a room situated above another. To-day it is used mainly for the vacant space at the top of a house, that between the joists and the rafters, and for a similar space above a stable or other outbuilding. The latter space, provided it is properly floored, is often used for storing hay or corn, or other accessories of the stable. It is sometimes used for pigeons, and on this account the term pigeon loft has come into general use. A loft of this kind can also be converted into a useful workshop or gymnasium.

In the case of a loft in a house the only difference between a loft and an attic is that the loft may be without a boarded floor, the only flooring being that provided by the joists. Such lofts are therefore useless. A loft can, however, be made serviceable, either as a storeroom or a lumber-room, or even as a study or a den, by laying down a boarded floor over the joists, provided they are strong enough, and making certain other alterations.

The ceiling joists, while presumably adequate for their proper purpose, may not be strong enough to carry additional loads. In deed, some care is needed when placing lumber in the loft, to dispose of the heavy articles on that portion of the joists which gets support from walls, partitions, etc. Expert advice should be obtained on these points. The conversion of a loft, or any similar work, may come under local by-laws, and the householder should satisfy himself about this before commencing any alteration.

The entry into a loft is generally through a trap door, or through one of the upper rooms in the house. A disappearing ladder is a useful fitting. Types are illustrated in the articles

on Attic and Ladder. The floor of the ceiling joists is laid with tongued and grooved floorboards at least 1 in. in thickness, which are tacked to each joist with 2½ in. oval brads, driven in with a light hammer so as to minimize the vibration, which otherwise might damage the plaster ceiling underneath. Great care must be taken not to tread upon the lath



Loganberry. Spray of leaves and large fruit that makes excellent preserves

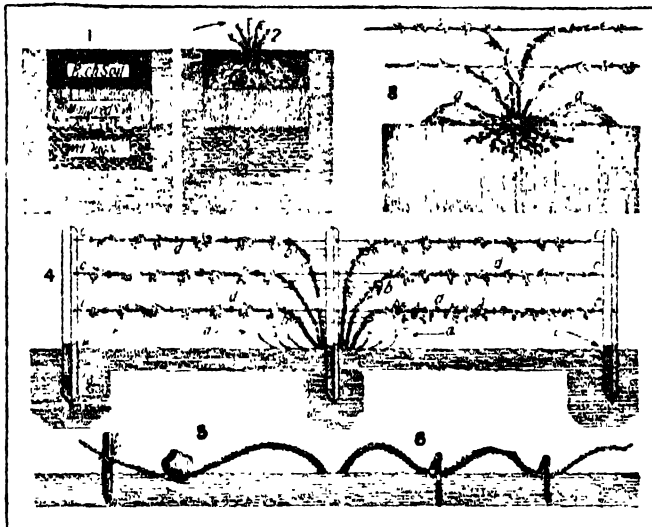
and plaster work. Some of the floorboards may be laid down temporarily and used to stand upon, or use may be made of any strong rough boards. Light might be admitted by means of a skylight, a window in an end wall, or a few slabs of glass substituted for roof slates. See Attic; Ladder.

LOGANBERRY. The general culture of the loganberry is similar to that of the raspberry. The fruit is large, deep red in colour, and of excellent flavour when thoroughly ripe. It is valuable for cooking and preserving. The plants should be about 12 ft. apart when planted to cover a trellis or against wires, and if there are two or more rows the distance between them may be about 7 ft.

The loganberry is easily propagated by bending the tips of the canes to the ground late in summer, pegging them in, and then leaving them to root. When they have rooted the cane is severed near the top, and is ready to be transferred to its fruiting quarters. The method of pruning the loganberry is by cutting out the old stems when the fruits have been gathered, the new shoots are tied to the supports.

How to Cook. The fruit of the loganberry plant is used in the same way as other cane fruits in the making of jams and jellies, and also for pies, pastries etc. It is seasonable in July. The general directions are the same as for raspberries.

When making jam use ½ lb. sugar and



Loganberry Culture. 1. How to prepare the soil. 2. Shoots cut down after fruiting. 3. Mulching, a, in summer. 4. Training, a, new shoots for next fruiting; b, centre supports for fruiting canes; c, wires; d, canes tied to wires; e, posts with ground bases tarred. 5. Propagating single shoot held down by stone, with cut behind bud. 6. Multiple propagation. Shoots pegged down at buds to form roots



LOGGIA. Fig. 1. Loggia of a stone-built Wiltshire house; it is furnished and used as a garden room

teacupful water to every 1 lb. fruit. If the fruit is very large and juicy, no water is required. Loganberries can be mixed with red currants and stewed, or made into pies, etc. in the same way as raspberries. They are also excellent mixed with apples.

In bottling loganberries, use water or syrup, $\frac{1}{4}$ lb. sugar to 5 quarts water makes a sufficiently rich syrup. The time required for boiling is 1½ hours and the temperature should be brought up to 160° for about 5 minutes. See Jelly, Lavtonberry; Pastry, Raspberry.

LOGGIA. A loggia is a pleasing addition to a house and can be put to excellent uses. It is somewhat after the nature of a veranda,

any case be well able to stand a good deal of exposure to the weather; otherwise there will be a constant carrying of chairs and tables to and fro. The furniture of an ordinary sitting room cannot, for instance, be kept continually in a loggia without serious damage resulting.

Three Examples. The illustrations here-with show three loggias in styles specially well adapted to various types and sizes of English houses. Fig. 1 shows a loggia belonging to a Wiltshire house, which is built of local stone. It is furnished as a garden room and can be used as an open-air extension of a living-room for hot weather.

Fig. 2 shows the loggia of a Sussex house, this being a part of England for which this feature is very suitable. It is not put to any special use, but folding chairs and tables would quickly convert it into a sun parlour if required. The charmingly designed window shown at the far end gives on to the rose garden. The oil jars and lighting fittings are particularly decorative. Fig. 3 shows another sheltered loggia which opens from one of the living-rooms. It is furnished in a more solid fashion. The benches and chairs afford plenty of accommodation when meals are taken in the loggia, while the side tables and plants suggest an air of homeliness and comfort.

These loggias are each part and parcel of a house, having been included in its original design, but it is quite possible in houses of a certain type to add a loggia to the existing building. Many houses in the country have a corner that could be roofed in at little expense. It is desirable that such a corner shall get a fair amount of sunshine and that the addition to the structure does not interfere with the adequate lighting of the adjacent

rooms of the house. See Garden Furniture; House; Veranda.

LOIN : Of Meat. This is a prime portion of meat, but not considered economical on account of the excess of fat. It is that portion of the animal that lies on both sides of the spine between the false ribs and the hip bone. In mutton and lamb, also in veal, this portion is sold as a joint and called the loin. In beef it becomes the ribs and sirloin. In pork it is known as the hind loin and fore loin, while in bacon it is called the back. See Bacon; Beef; Mutton; Pork.

LOMARIA. Most of the family of ferns known as lomaria require greenhouse treatment. They have feather-shaped leaves, thrive best in shady positions in the greenhouse, and require plenty of water from spring, all through the summer, till autumn. Propagation is by spores sown in fine soil in the warm house at any time of the year. Lomaria (Blechnum) spicant is a hardy fern of which there are many varieties.



Lomaria. Feather-shaped fronds of a fern which requires greenhouse treatment

LOMBARDY POPLAR. A hardy deciduous tree *Populus nigra pyramidalis*, the Lombardy poplar thrives best in deep, moist soil, but will flourish almost anywhere. It serves as a boundary screen, or as a quick-growing lofty hedge if kept well trimmed. For small gardens it is not suitable, owing to the extent to which its roots rob the soil of moisture and nourishment. See Poplar.

LONDON PRIDE. One of the commonest of all garden plants, London pride (*Saxifraga umbrosa*) is familiar as an edging to shady borders. It has rosettes of evergreen leaves and in May bears graceful sprays of pinkish flowers. It flourishes in ordinary soil and pieces may be detached and replanted at any time of the year. See Border.

LONGCLOTH. This form of calico gets its name from the fact that similar cotton cloth imported 200 years ago from India was put up in long lengths, not in short pieces. It is plain woven and made square with threads just as fine and as many in one direction as in the other, so that it is equally strong in warp and weft. Woven 28 to 36 in. wide, longcloth can be bought either bleached or unbleached, and it is made in standard qualities that are denoted by trade marks.

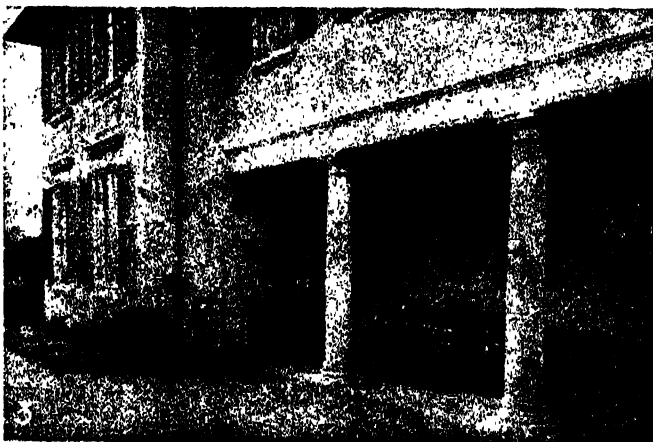
LONG MEASURE. This is in constant use for measuring lengths of materials, ground, etc. It is as follows:

12 inches	= 1 foot
3 feet	= 1 yard
5½ yards	= 1 rod, pole, or perch
40 rods	= 1 furlong
8 furlongs	= 1 mile
3 miles	= 1 league

LONGPORT : The China. This Staffordshire ware was produced at this suburb of Burdett in the 18th century. In 1793 the Longport works were acquired by the Davenport family. See China; Davenport Ware.



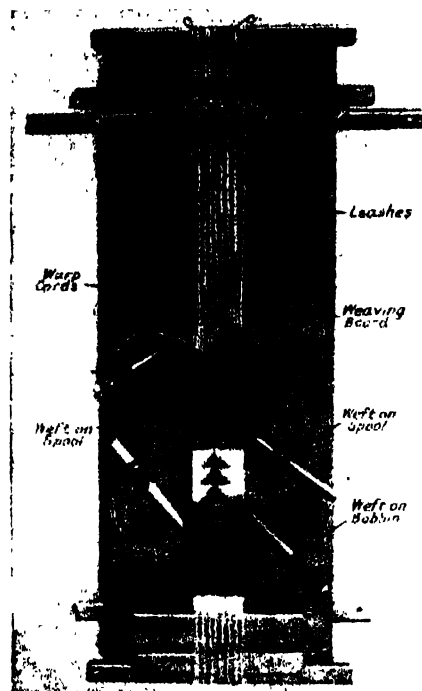
being part of the actual structure of the house, and is an added attraction to a seaside bungalow. It is desirable that the loggia should stand well above the level of the garden, as in this way a clear outlook will be assured. Obviously it should be erected on the sunniest side of the house, but should be carefully sheltered from extreme winds, so that it may be a cosy outdoor room. If it is to be used for meals it should be conveniently placed with regard to the kitchen.



Loggia. Fig. 2. Charming paved loggia of a Sussex house. Fig. 3. Sheltered loggia furnished for summer use

1 and 3, Courtesy of Country Life; 2, Humphrey Joel

LONG SIGHT. Long-sightedness, or hypermetropia, is generally due to the eyeball being shorter than the normal length from front to back. Consequently the image is



focussed behind, instead of on the retina. Near objects cannot be seen distinctly; distant objects may, but this requires an effort when the long-sightedness is extreme. The cure is to wear convex glasses which will focus all rays entering the eye accurately on the retina. See Eye; Spectacles.

LOO: The Card Game. This is a game for any number of players, but six to seven is the best number. It is played with the ordinary pack of 52 cards, which rank as in whist.

The dealer deals three cards one at a time to the players, and also an extra hand, known as miss. The next card on the top of the pack is turned up for trumps. Each player in turn looks at his hand, and is asked by the dealer if he will play, or take miss, or pass.

If the player has a good hand he usually elects to play; if not, he can either take the three cards in miss or pass. In the last case he signifies by doing so that he is not taking any further part in that round of the game. Every player in turn is offered the option of playing, taking miss, or passing. As soon as one player takes miss, those who follow have only the option of playing or passing. The player who takes miss must play, no matter how bad the cards in miss may be. If only one player plays, he takes the pool. If all except the dealer pass, the latter takes the pool. The pool is formed at the beginning by each player putting in a counter.

The eldest hand of those who have agreed to play leads. He must lead according to the following rules: If he has two trumps in his hand he is compelled to lead one. If he holds the ace of trumps he must lead it, or if the ace happens to be the turn-up and he holds the king he must lead the latter. If only two players are playing, the leader, if holding two or more trumps, must play the highest. Each player must follow suit if possible, and must

try to beat the last player's card. If unable to follow suit he must trump, and if the trick has already been trumped he must over-trump if he can. The winner of each trick leads for the next, and must lead a trump if he has one.

The Pool. The pool is divided in the proportion of one-third for each trick. If one player has taken two tricks, for example, and another one, the first takes two-thirds of the pool and the second one-third. The remaining players are said to be loosed and place in the pool an amount, with the new dealer's contribution, which totals the original amount of the pool, to form the new pool. If only three players play and each takes one trick, the other players are not loosed, but the new pool is provided by the dealer. This hand is then usually known as a must, the meaning of this expression being that each player must play, whatever his cards may be and the miss is not dealt.

LOOMS: FOR HOME WEAVING

Constructional Details of a Workable Pedal Loom

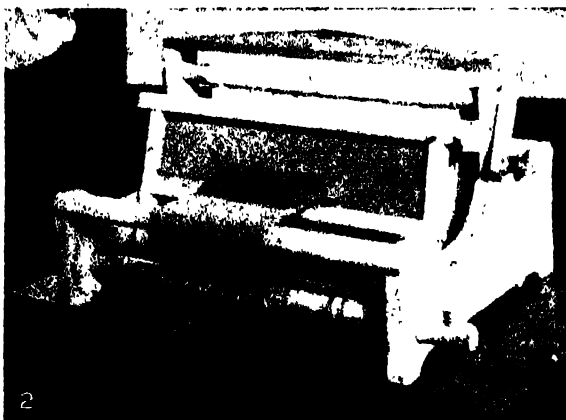
This contribution describes a handy type of table loom, and tells the woodworker how to make a portable loom of a larger type. The home weaver will find the craft clearly explained in the article on Weaving. See also Rug; Tapestry.

Hand looms range from a board loom such as that shown in Fig. 1, on which narrow tapestry can be woven, to the table loom shown in Figs. 2 and 3, which permits of work up to 33 in. wide, and the pedal operated loom (Fig. 4), on which a variety of fabrics up to 42 in. wide can be made.

Making a Pedal Loom. The loom illustrated in Fig. 4 differs from the conventional

clear. The uprights should be of well seasoned hardwood, 2½ in. by 2½ in. They are connected by rails made of 1 in. beech dowel rod, which run through and are pegged at the ends. It will be seen that the side rails go through the intermediate short uprights on which the breast roller rests, and are pegged at the short upright so as to space the latter squarely at the proper distance from the inside of front uprights. The toothed cross bars which support the harness and sley are 2 in. by 1½ in., tenoned into posts and pegged.

The side frames are connected together by two rails at each end. These rails must come lower than the tenons of cross bar and dowels of lower rail respectively, so as to leave enough wood between for adequate strength. Two brackets for warp roller are dowelled into back posts at a height of 2 ft. 6 in. from ground, and two for breast roller into the intermediate posts at 2 ft. 2 in., both measurements being to centre of hole where it enters post. The brackets shown are made of dowel rod set in at an angle, but shaped brackets might be substituted if wished. The seat board fits on to upper side rails between front and intermediate posts, being cut round front posts. The method of constructing the frames and

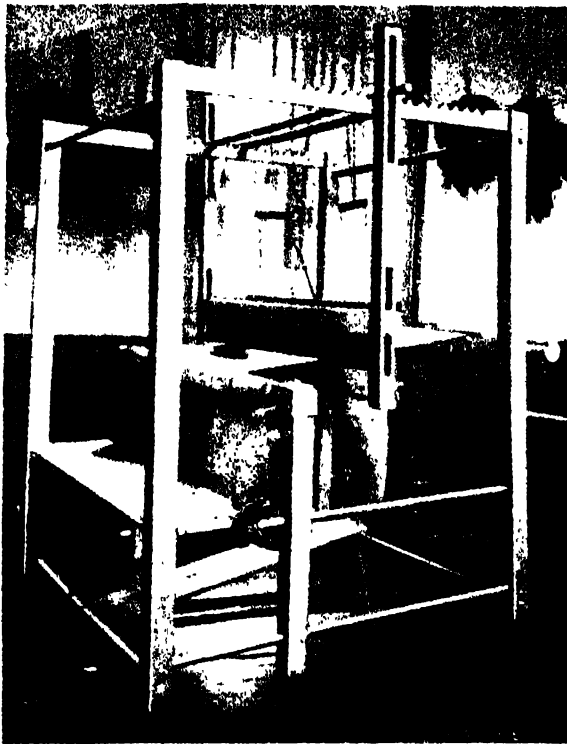


English type in construction (see Weaving) and might at first inspection be thought somewhat slight for its purpose. Developed from a simple Greek prototype, it has been used constantly in a weaving studio over a period of years, the design being modified as and when improvements were found desirable. The frames are held together by dowels and pegs, so that the whole structure is readily erected or taken down.

Back, front and side elevations are given in Figs. 5, 6 and 7. In conjunction with Fig. 4, they make the method of construction quite



Loom. Fig. 1. Simple board loom, arranged for weaving narrow tapestry. Figs. 2 and 3. Alston table loom, a compact portable appliance which takes warps up to 33 in. wide



Loom Fig. 4. Pedal loom on which a variety of fabrics up to 42 in. wide can be made. Its construction is illustrated below
Courtesy of Alton Weaving Studios

rails which hold the reed. The cap, or upper rail, is free to move up in the slot in the swords, so that the reed can be inserted or removed. The lower bar is fixed by pegs to the swords, and the cap also has holes for pegs, so that it can be secured when the reed has been inserted. The reed measures about 5 in. in depth, and is held by the grooves in cap and lower rail. The slots in swords and the tenons on cap and lower rail must be accurately cut, and the peg holes in the upper part of swords should be evenly spaced so that the batten hangs level from the roller. The rack teeth, too, must be accurately cut and spaced or the sleigh will not hang squarely across the loom. The whole of this part of the loom needs especial care, and the materials must be good seasoned stuff free from shake or twist. Fig. 8 is an end view of the sleigh showing slots and the tenon of rails.

The harness is shown diagrammatically at Figs. 11 and 12, and is represented as the simplest form, with two heddles. The laths should be made of oak, 1 in. by $\frac{1}{2}$ in. section. The short upper laths are slung by a loop passed round the supporting roller and through a hole in the centre of lath. The endless cords connecting short laths to heddle laths are about 40 in. long before making the knots. The connections to pedals are clearly

shown in Fig. 12, corresponding parts being lettered A and B respectively. A single cord might be taken from centre of lower lath to pedal if desired. For clearness, the heddle laths are represented with two leashes only on each pair. Slip knots in the connecting cords permit of any desired adjustment for length. The pedal boards are 4½ in. wide hinged by loops to the bottom front rail, as shown in Fig. 4, and provided with a series of holes at the other end, in one of which the cord to lower heddle lath is fastened.

The heddle leashes can be procured ready made in lots of 100, tied in 25's. A reed will be needed, and a raddle. The warping board can be made by the home worker, and full instructions will be found in the article on Weaving, where also are the necessary instructions for making the warp, entering and beaming the warp and setting up the harness. The accessories needed, and supplies

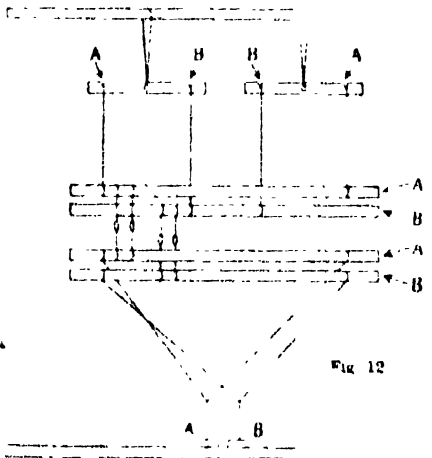


Fig. 12

connecting them together permits the loom to be dismounted and packed into small compass. If portability is not desired the end rails might well be made of rectangular section stuff mortised and tenoned to posts in the conventional way.

The Rollers. The breast roller (Fig. 10) is turned from 2½ in. stuff, and one end is left square for a distance of 4 in. Two holes for a turning stick are bored through at right angles, and the stick may be a piece of 1 in. dowel. The cane roller or warp roller is similar, but the squared end is at the opposite side. Both ends of this roller might be left square if desired. Both front and back rollers are grooved to take the cane which secures the warp in place. The groove, $\frac{1}{2}$ in. square, is indicated in the diagram of the cane roller. Fig. 4 shows how the rollers are mounted on the breast sets, the breast roller with its square to the right and the back roller with its square to the left, both viewed from the front of the loom (seat board). The diameter of the rollers, especially the warp roller, may be increased with advantage.

Sleigh and Harness. The sleigh or batten (Figs. 5 and 6) consists of four parts, the two sides or swords, by which it is hung from a roller supported on the rack, and two grooved

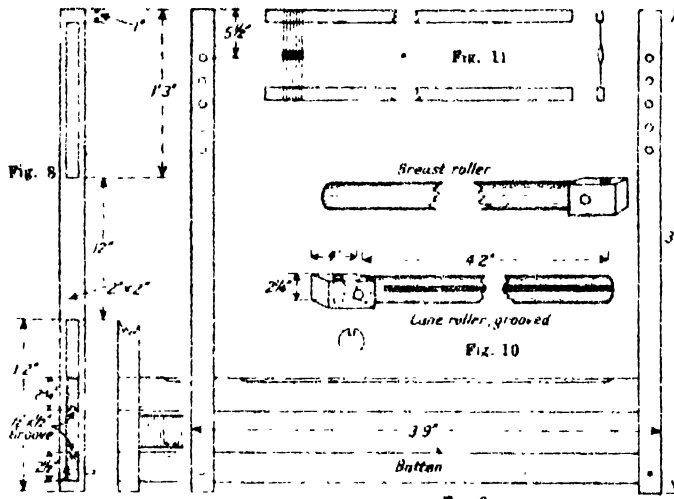


Fig. 5

Fig. 6

of materials, can be obtained from the larger arts and crafts shops and from departmental stores.

LOOP. A dress maker's loop is used instead of an eyelet or metal eye. To work it, lay two or three threads along the material for about ½ in., or according to the length required for the size of the hook. The threads are laid by catching up a little of the material at each end of the space, then a back-stitch is done after the

last thread is laid to secure them. Fill these laid threads with buttonhole stitches and fasten them off securely into the material at the end of the loop.

LOOSE COVERS. These are removable, well-fitting covers to protect the upholstery of furniture, conceal the wear-and-tear sustained by upholstered chairs, chesterfields, and settees, and bring odd pieces into a harmonious colour scheme. Directions for fitting and making are given in detail under the headings Cover, and Upholstery.

LOOSESTRIFE. The purple loosestrife (*Lythrum salicaria*) is a familiar British plant often seen by the water-side. *Lythrum virginicum* Rose Queen is a valuable hardy garden plant; it grows 3 ft. high, thrives in ordinary

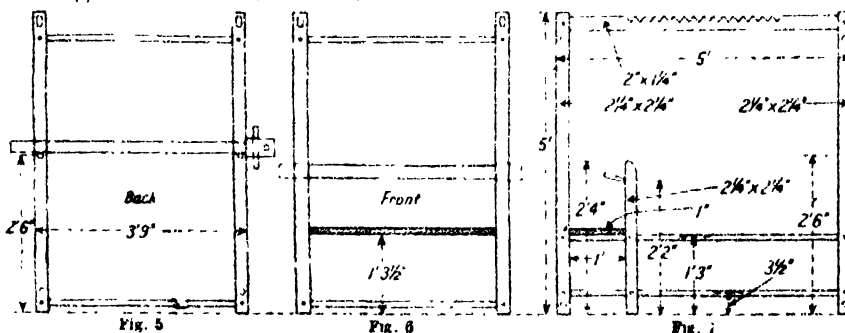


Fig. 5

Fig. 6

Fig. 7

Loom: construction of a pedal type. Figs. 5, 6, 7. Back, front and side elevations. Figs. 8 and 9. Details of sleigh, showing grooves to take reed. Fig. 10. Breast roller and cane roller. Fig. 11. Leashes on heddle laths. Fig. 12. Connections from heddles to roller and pedals

Courtesy of Alton Weaving Studios

soil, and bears rose-coloured flowers in summer. Propagation is effected by dividing the clumps in autumn.

LORDS AND LADIES. This is a common name for *Arum maculatum*, a familiar wild plant also known as cuckoo-pint, wake robin, and Italian arum.

LOGNETTE. A lognette is an eyeglass or pair of eyeglasses made to be held in the hand instead of being fixed on the nose. Tortoiseshell is frequently used for the fittings of long-handled lognettes, and gold for the more old-fashioned types, with springs for folding, or hinged between the glasses. These lognettes can be fitted with convex glasses for reading and with concave ones for distant work. See Eyeglass; Spectacles.

LOST PROPERTY. The law relating to articles lost and found is, roughly speaking, that a person who finds an article can keep it against all the world except the true owner, but if the true owner turns up he can either claim the article or its full value. An honest man who finds anything will endeavour to discover the owner, but in law he is not entitled to any reward, nor even to the expense to which he has been put.

No one is entitled to anything found on someone else's ground, not even if that ground is a railway station or a railway carriage. Articles lost in such places belong to the owners of the ground as against everybody except the true owner. Property in public vehicles must be handed to the person operating the service, and claimed within 3 months. The owner pays 3d. and 1% of the value if that is over 2s., but cannot be required to pay more than £2. At Scotland Yard there is a special department to deal with property lost within the London area, except for property lost on vehicles of the London Transport Executive, which operates its own lost property office. Individuals who have lost valuables may offer a reward for their return, publicly to this being given by the police. Anyone who keeps for himself any article he finds is guilty of theft.

British Railways have lost property offices where application should be made by persons who have lost anything while travelling, or left it in a railway carriage. The lost property will be returned to the applicants on payment of a fee.

LOTION. A liquid preparation of a drug, for external application, is known as a lotion. It is made to dry quickly by adding alcohol, and slowly by the addition of a little glycerin. Lotions are classified as antiseptic, antipruritic, astringent, soothing, and stimulating.

To apply an antiseptic or other lotion, soak a piece of lint in it and lay the lint on the part with the smooth part downward. Over this place a piece of oiled silk or other waterproof material, which must project about $\frac{1}{2}$ in. all round the lint. Cover with a layer of cotton wool and bandage. Antiseptic lotions are also used to cleanse ulcers and wounds, a piece of lint or sponge being dipped in and then squeezed over the wound.

An evaporating lotion is used for cooling some parts of the body. It may be very grateful in headache, especially brow ache, in sprains and strains, and in acute inflammation of the skin from whatever cause. Alcohol or weak acetic acid or vinegar or water is generally employed for the purpose.

LOTTERY. A lottery is a distribution of prizes by lot or chance, e.g., a sweepstake. With certain exceptions it is illegal to print, sell, or distribute any tickets in a lottery, whether the lottery is held in this country or abroad. It is not regarded as illegal to buy a ticket abroad, but tickets entering this country may be stopped by the Post Office.

Lotteries may legally be conducted in connexion with entertainments such as bazaars, sales of work, etc., so long as certain conditions are observed. The whole proceeds

of the entertainment must be given to charity after deduction of expenses of the entertainment, including the expenses of printing lottery tickets, but no other expenses of the lottery and not more than £10 for prizes. Money prizes are prohibited. The tickets can be sold and the result announced only during the entertainment. The lottery must not be the only substantial inducement for persons to attend the entertainment.

Private lotteries are also legal. These are lotteries which are confined to members of some society or to persons who all work or live on the same premises. All the proceeds of the lottery after deducting the expenses of printing and stationery must be used for the prizes or for the purposes of the society. A lottery of this kind must not be advertised except on the premises of the society or where the person for whom it is promoted works or resides. The tickets must state the price, the names and addresses of the promoters and the class of persons to whom tickets may be sold, and no prize must be paid to anyone except the person to whom the ticket is sold. Tickets must only be sold for cash and must not be sent through the post. If it is desired to run a lottery in connexion with a local entertainment, it is best to consult the local police for advice.

It is illegal to run in a newspaper or in connexion with any trade or business any competition to forecast the result of a future event—e.g., who will win a football match. This does not apply to football pools. See Gambling.

LOTTO. This game is played with oblong boards or cards and counters. The cards are divided into 27 spaces, 9 in a row. Four in each row are blank and the other five are marked with numbers, which may be any figure up to 90. The 90 counters are wooden or ivory pieces, marked from 1 to 90.

The players take one or more cards each, and the banker shakes the counters one by one from a bag. As each falls he calls out the number, and the players who have that number on their card mark it, usually by covering it with a counter. This continues until one player has covered all the numbered squares in one row on his card.

LOUD SPEAKER. The device in a radio receiving installation that changes the amplified electrical variations into sound vibrations. Practically all modern loud speakers operate on what is known as the "moving-coil" principle. A small coil is suspended between the poles of a powerful magnet, and when the low-frequency electrical variations pass through this coil it vibrates and communicates its movement to the diaphragm to which it is fixed.

In some main-type receivers an electro-magnet is used for the loud speaker and the loud-winding of it made to act as a smoothing choke as well. However, a permanent magnet has the advantage of relative freedom from induced hum, and special nickel-iron alloys have been developed with which high degrees of permanent magnetism are possible.

The diaphragm is made in a conical form, as this shape is the most effective one for obtaining the greatest stiffness in the lightest construction, but the cone must be as shallow as is practicable or the diaphragm will tend to increase unduly the directional effect of the high notes. Varnished fabric or moulded fibre is employed, as such materials have the required stiffness and yet have much less natural resonance than, for example, metal.

The lower sound-wave frequencies do not leave the diaphragm directionally, but spread out widely. If some form of screen is not interposed, those leaving the front of the diaphragm will meet those leaving the back of it and there will be a neutralizing effect. That is why a loud speaker "chassis" removed

from its cabinet will sound high pitched. The cabinet acts as an intervening screen or "baffle" between the two sides of the diaphragm.

The coil of a loud speaker must be "matched" with the output circuit of the set. This is possible by winding the coil with sufficient wire to give it the necessary relatively high impedance, but it is more convenient to restrict the winding to the small dimensions which produce a low impedance and to use a step-down transformer in order to achieve "matching." This "output" transformer may be built into the loud speaker or separately contained in the set.

"Extension" loud speakers for use at points distant from the set in addition to the loud speaker in the set itself are frequently fitted with transformers having a multiplicity of connections enabling efficient matching with any type of set to be obtained. However, many receivers have special extension loud speaker terminals or sockets for connexion to low-impedance loud speakers which need not embody transformers.

The loud speaker does not, as is commonly supposed, appreciably affect the power consumption of a radio receiver. For instance, on a battery set no more low-tension or high-tension current will be consumed if the volume be increased or if one or more additional loud speakers are employed. It is true that there is a type of amplification control (known as "variable mu") which, depending on the high-frequency amplifying circuit, affects the high-tension current consumption to some slight extent, but it is, for practical purposes, a negligible effect when heard and other powerful stations are being received.

The faults which can occur in a well-designed loud speaker are few in number. In the electro-magnetic mains driven type the most frequent is the "burning out" of the field-winding. This often happens when the field-winding is also used as a smoothing choke. The effect is that the set is completely silenced.

A continuous buzzing, as though a large insect is beating its wings on the diaphragm, may indicate that one of the turns of wire on the moving coil has come loose. If a similar noise is heard only when there are loud passages of speech or music it may be due to the coil being out of centre and scraping against the poles of the magnet.

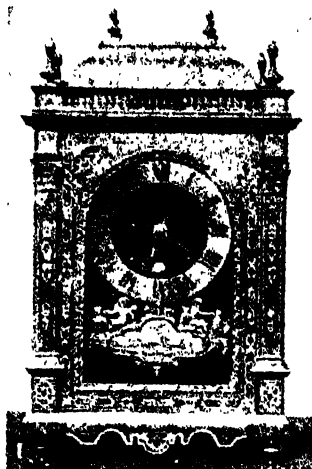
In choosing a loud speaker, or judging the merits of a receiver in respect to its loud speaker, the following points should be borne in mind: The high notes should be crisp and clean and the sibilants in speech clearly audible but not exaggerated. The low notes should sound natural and not have undue persistence or boom. A loud speaker ought not to have any "tone" of its own. It is not a musical instrument, but merely a reproducer of sounds. Any tendency to give emphasis to one or more particular frequencies is a definite fault whether it be evinced by a "mellow" booming of the bass notes or a strident emphasis of one or more of the higher frequencies. To test it, the loud speaker should be listened to carefully when it is operating at a volume slightly above that which it will normally be operated. See Wireless, etc.

LOUIS STYLE: In Furniture. This general term is applied to the four styles of furniture and decoration which were produced in France during the reigns of four of the Louises, namely—XIII, XIV, XV, and XVI.

Louis XIII. The style Louis XIII, or Louis Treize, was a reaction from that of the previous reign with its superabundance of carving and painting and rich ornament created and revived by the Renaissance. Louis XIII chairs were small and rectangular in contour, with slight frames of woods covered by well-padded velvets, tapestries and embroideries, fastened by

round-headed brass nails. The arms of the chairs, however, were rarely padded; the legs were joined by stretchers. Large armoires or wardrobes, chests of drawers and knee-hole desks were embellished with inlays of coloured woods, ivory and bone, depicting flowers and birds. The walls were panelled and adorned with mirrors. This particular style corresponded in period to the early Jacobean in England, but was far less severe.

Louis XIV. The Louis Quatorze (Louis XIV) style is a heavy classical one. The furniture was overlaid with carving, rich inlays and heavy carved metal mountings after the designs of Buhl. Some magnificent pieces were made in this style. The chairs had tall backs, square or V shaped; the cabinets were large, glazed and often bowed. The sofas were ample



Sèvres plaques, while silver is introduced to tone down the gilding. Red and green are the predominant colours. Tapestry from Beauvais and the Gobelin factory, and silks were used for the upholstery. The backs of the large chairs are rectangular or oval; the legs are tapered and fluted as shown in the chair illustrated in Fig. 3, which is familiar in appearance as the

leading characteristics of most of the work of the 18th century, were finished with a minute delicacy of touch. The famous 18th century English cabinet makers were not greatly influenced by the Louis styles, although Chippendale furniture certainly frequently shows Louis XV ornamentations. See Chippendale: Jacobean: Tapestry.

LOUNGE: How to Furnish. Unless the term is an affliction, to style a sitting room a lounge means that it is furnished with special regard to comfort and relaxation. It is essential that the colour scheme should be restful without being depressing and that the room should have a cosy, homely atmosphere about it, as it often takes the place of a smoking-room and combines a card-room with an informal sitting room for general family use. In country or large detached houses the lounge is usually either an extension of the hall, or a spacious and pleasant room with access to the garden. The former type is discussed in the article on Hall, the latter is well represented in our first illustration.

With its southern outlook over the garden and cheery French windows this lounge is furnished in the most reposeful fashion with a number of large armchairs and a comfortable settee. The velvet chosen for the upholstery gives a particularly rich appearance and is an ideal fabric for a lounge. This appearance is enhanced by the pile carpet with its unobtrusive border and all over trellis pattern. There is nothing definitely binding to any particular period, either antique or modern, in the room. The wide planning of the brick fireplace is in perfect keeping with the rest of the decoration, and the dark note of the woodwork is repeated on the ceiling with excellent effect. On either side of the fireplace is a delightful little window with a view on to the tennis lawn. The lighting is from wall brackets and table lamps.

In such a sunny room a restful and beautiful colour scheme would be evolved by choosing soft magnonette greens for the two-toned carpet, the deeper shade of green for the velvet upholstery, the lighter shade for the wallpaper. Above the mahogany picture rail the frieze and ceiling would be washed with primrose yellow in a clear pale shade. The warmth of the brick and the woodwork of the fireplace contrast happily with these colours, and the printed linen for the curtains would repeat the mellow tones of the brick in



Louis Style. FIG. 1. Clock of the Louis XIV period, in a buhl and ormolu case. FIG. 2. Commode with overlaid marquetry of mahogany, and heavily mounted with chased ormolu; period Louis XV. FIG. 3. Louis XVI chair of carved and gilded wood upholstered in tapestry.
By permission of the Director, Victoria & Albert Museum, S. Kensington

in size, and for their rich brocades and tapestries of baroque designs were used. Fig. 1 shows a clock of this period with its fluted design, classical pilasters, baluster rail and Buhl case with ormolu mounting. Louis XIV style greatly influenced English furnishing and decoration during the reigns of Charles II and James II. The period concluded approximately with Queen Anne style in England.

Louis XV. Louis Quinze (XV) is the rococo style. The wood was heavily carved, or covered with composition moulded into enrichments of rocks, shells, waterfalls and scroll work; among the latter doves, cupids, and heads and busts of women, terminating in foliage were prominent. Much of the furniture is gilded or painted in delicate tints.

Other pieces were veneered with marquetry and decorated with heavily chased ormolu mountings as seen in the commode in Fig. 2. The chairs and couches have sweeping curved backs upholstered with tapestries, having flowers, figures, or animals worked thereon, or in flowered brocades. The woodwork is gilded. Corner cabinets and little round tables were also produced in this period. These are enriched by inlays of birds, figures and landscapes carried out in tinted and stained woods. Louis XV style was often too exaggerated and florid for real beauty. It corresponded in period with the mid-Georgian in England, but lacked the fine designs of the best English furniture and decoration of the time.

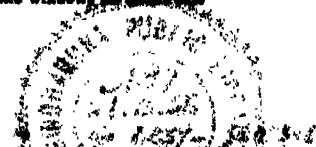
Louis XVI. In the style Louis Seize (XVI) appear rectangular panels having simple mouldings and fluted columns, with quill and husk fillings. Dainty ribbons and bows in ormolu and marquetry surround richly painted

prototype of many pieces in suites designed for drawing rooms and labelled Louis Style.

The marquetry of the period was executed with extraordinary smoothness and finish, and the mounts of gilded bronze, which were



Lounge. FIG. 1. Corner of room showing result of harmonious planning. The restfulness of the lounge is enhanced by the velvet upholstery and the fireplace with its little windows on either side.
Hamphrey & Vera Jost





Lounge. Fig. 2. Modern lounge in which severity of line is delightfully contrasted with richness of furnishing fabrics and the comfort of the divan and settee.
Humphrey & Vera Joel

its conventional floral pattern with touches of yellow and brown on a green ground.

In the second illustration a different type of lounge is shown, but here again the keynote is one of restful ease. Though the divan and settee are severe of outline, in keeping with the simplicity of the style of the room, they are luxuriously comfortable. There are no pictures, no frieze or cornice, and no break in colour or glossy texture of surface between the wall and ceiling. These details increase the height and apparent size of the room and emphasize the uncommon design of the windows which add great interest to the scheme.

The upholstery in this case has been carried out in a modern heavily ribbed fabric and the curtains are of dull-surfaced silk. The carpet is a velvet pile in modern design. The built-in bookcase, the table and the two floor standards are finished with cellulose lacquer. With so much glossy paintwork it is essential that the furnishing fabrics and carpet should be mat and soft of texture. The colour scheme for such a severely simple lounge should be striking, and a beautiful effect would be gained by using a pale French blue for the walls and ceiling, dark grey for the woodwork of the skirting, architraves of doors and windows, a lighter tone of the same grey for the upholstery fabric and the fireplace surround, and three shades of grey for the carpet. The curtains would blend with the scheme by being of shot blue and silver grey silk, but the whole room would be brightened without any disturbing effect in such a reposeful setting, by choosing lacquer red for the colour of the standard lamps, bookcase, table and leather floor cushion. The pleated lampshades would be of parchment colour tied with red and silver cords. See Colour: Decoration; Hall; Living-Room.

Louise. See Lies.

LOUVRE. This is a form of ventilator, which may be made in wood, metal, glass, or other material, and consists of a framework, across which a number of parallel slats are fixed, so that they incline downwards, the bottom of one slightly below the top of the next.

a form of lantern, placed on the roofs of out-buildings for ventilation purposes. See House, Shutter.

Love Apple. This is an old name for the tomato (q.v.).

LOVE BIRD. This name properly belongs to a small parrot native to Central and S. Africa, but it is commonly bestowed on the budgerigar (q.v.) or Australian long tailed grass parakeet. The name "love bird" derives from the affection which these small birds appear to show, especially when they are kept in pairs as cage or aviary pets. One is certainly not happy alone. Colour and markings vary considerably, the birds are handsome and entertaining as pets, and they are not difficult to manage. They thrive on packets of mixed seed, and occasional fresh greenstuff, and clean water should always be available. With patience they can be taught to mimic sounds and repeat short sentences.



Love Bird. Specimens of Australian Budgerigar, popularly known as Love Birds

of the flowers is enhanced by the finely divided leaves which surround them. The best variety is called Miss Jekyll, it has flowers of deeper blue than the typical kind, *Nigella damascena*. Seeds are sown out of doors in April where the plants are to bloom in summer, or in early September for spring flowering.

LOVE LIES BLEEDING. This half-hardy annual (*Amarantus caudatus*) bears crimson flowers in long drooping racemes. Seedlings, usually raised under glass in March, are planted out in June, but seeds may be sown out of doors in late April and May.

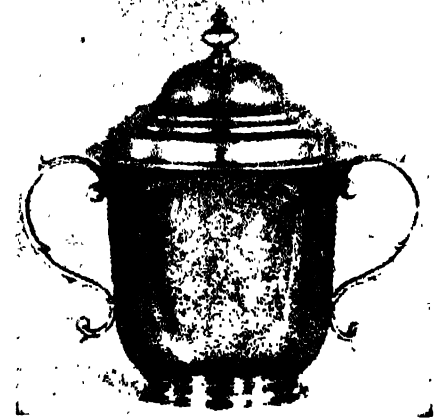
LOVING CUP. The loving cup is a large drinking vessel, usually made of silver, with two handles and sometimes three, which is filled with wine and circulated at public banquets, each guest drinking and passing it on to his left-hand neighbour.

Traditional formalities in the passing of the loving cup are observed at state banquets, civic feasts, and university gatherings, to pledge health. The diner who drinks stands to

receive the cup from the diner on his right, to pledge the one on his left, and remains standing to guard the latter's rear until he has in turn passed the cup. It is sometimes called the grace cup, because in medieval times wine was drunk from it after grace. The cup was formerly filled with wine, ale, or mead, but it now generally contains spiced wine. This custom of drinking from one cup was observed at the Jewish paschal supper.

Louvres are found as ventilators fixed to the top of a roof, and in other exposed positions, as their structure is of a durable character, and calculated to withstand the attacks of the weather. A small louvre panel fixed in a door is a convenient method of obtaining ventilation while excluding any possibility of vision. Sometimes the word louvre is applied to

receive the cup from the diner on his right, to pledge the one on his left, and remains standing to guard the latter's rear until he has in turn passed the cup. It is sometimes called the grace cup, because in medieval times wine was drunk from it after grace. The cup was formerly filled with wine, ale, or mead, but it now generally contains spiced wine. This custom of drinking from one cup was observed at the Jewish paschal supper.



Loving Cup. Example of a two-handled loving cup in silver, dating from 1710-11, height, 7 inches
Victoria & Albert Museum

LOWBERRY. This valuable berryed fruit was obtained by cross-breeding between the loganberry and the blackberry; the large fruits have a blackberry-like flavour. The cultivation is similar to that of the loganberry (q.v.).

LOWESTOFT CHINA. The porcelain produced at Lowestoft during the later half of the 18th century was of the same type as Bow and Worcester. As there was no factory mark, specimens of it used to be attributed to these works, especially as the Worcester crescent was sometimes copied at Lowestoft. Because of its rarity there are a number of counterfeits of this ware.

The factory turned out bowls and useful services, with blue and red decorations, sometimes with panelled borders containing local scenes. The ware is inclined to be heavy, opaque and yellowish, with a dull and



Love in a Mist. Blooms of the rich blue variety named after Miss Jekyll



Lowestoft China. Teapot and cup and saucer of the porcelain formerly produced at Lowestoft. It is decorated with a Chinese design of flowers and birds.

speckled glaze. Ribbed and fluted cups, decorated with detached or linked sprigs of flowers, besides embossed teapots, and pieces inscribed "a trade from Lowestoft," may be looked for.

An unsolved mystery is the use of the term Lowestoft china for armorial ware made and painted by Chinese artists at Canton during the 18th century, and never imported into a manipulated at Lowestoft. See China.

LOW FREQUENCY. This term is applied to alternating currents having frequencies up to about 10,000 cycles per second. There is actually no definite dividing line between high and low frequency currents, but in radio the term low frequency is normally applied to those frequencies which are within the limits of audibility. See Detector; High Frequency.

LOW TENSION (L.T.). This name is given to the voltage which is applied to the filament or heater of a wireless receiving valve in contrast to the high tension voltage which is applied to the anode. In a battery-operated radio receiver, the low tension battery may take the form of a 2, 4, or 6 v. accumulator according to the type of valves used. In the case of an "all mains" receiver, the heat current is derived from a suitable low tension winding on the mains transformer. See Accumulator; High Tension, etc.

LUBRICATION: In the Home. There are many materials that possess properties which render them peculiarly adapted for use as lubricating agents. Of these, a mineral oil forms the base of nearly all lubricating oils, the practical value of which depends almost entirely upon the proportion of the constituents and the method of manufacture. Broadly speaking, oil suitable for a typewriter, sewing machine, or clock is thin, almost as fluid as water, and very pale in colour. Only the very best typewriter oil should be purchased for lubricating the typewriter, and similarly the sewing machine should be oiled with good sewing machine oil.

For clock work only the very finest specially prepared oils should be used. In ordinary household use for such purposes as oiling the bearings of a lawn mower, mangle, or other similar appliance, employed for comparatively light work and during short periods, any good quality light machine oil will give satisfactory results.

Lubricants for Bearing Surfaces.

Among lubricants used for bearing surfaces are graphite, soapstone, and a variety of others which are used dry. Of these, powdered graphite gives excellent results on cast iron surfaces. Solid lubricants, when mixed with animal fats, grease, vaseline, or the like, are converted into semi-solid grease, which may be used for bearings and is excellent for small carts

and the like. For some purposes vaseline is a good lubricant, especially for slow moving shafts and bearing surfaces. Lubricants for high speed bearing surfaces, such as those in a small electric motor, require a thin oil, generally an animal oil.

Objects made of wood and provided with bearing surfaces, such as the slides or bearers supporting a drawer, may need lubricating. This is best accomplished by the use of dry graphite, but in practice it can seldom be used as it tends to soil anything which comes in contact with it. Alternatively, French chalk, fuller's earth, or powdered talc can be employed for the purpose.

The lubricating of gear wheels is difficult when they are not enclosed in a greaseproof gear case. If they do not revolve at a high speed they can be treated either with graphite in the form of a paste or with a heavy gear oil

about the thickness of stiff treacle. On small gears vaseline will often give good results.

In using lubricants for any machine in the home, it is best to wash out the bearing surfaces occasionally with paraffin, wipe the exterior clean, and oil the bearings with fresh oil. Run the machine for a minute or two to make sure the paraffin is entirely disposed of and that every part is properly oiled. Again wipe all the exterior dry and apply a few drops of new oil, which will keep the bearings in good condition and add to the life of the machine. When the bearings are to be oiled the oil holes should be cleaned out before applying the lubricant, otherwise grit and dirt are washed down into the bearing, and set up a grinding action which tends to damage it. Lubricating oils should be kept in closed containers and stored in an equable temperature. See Bicycle; Oil.

LUBRICATION FOR MOTOR VEHICLES

How to Keep Car and Cycle in Good Running Order

This article deals with a subject of importance to the motorist, who will find other useful information in the articles Motor Car; Motor Cycle and Motoring. See also Gear; Live Axle, etc.

In all modern motor car engines the lubricating oil is circulated by a pump automatically operated by the engine. This pump, which is usually little more than two gear wheels enclosed in a case, draws the oil from the crankcase sump, or a tank, and delivers it under pressure to the main bearings.

The methods employed for ensuring adequate lubrication vary in principle and detail, but roughly they may be divided into three classes as follows.

(1) **Circulating Splash** (sometimes called pump and trough). In this system the pump blivers the greater part of the oil through suitable pipes or passages to a series of troughs arranged in the crankcase below the path of the connecting rod big end bearings. At the end to the lowest part of the latter is a small lipper which picks up the oil in the trough and throws it so that as this is being repeated several hundred times a minute, the moving parts of the engine are working in an oil mist. Some of the oil falls into troughs attached to each main shaft bearing, to the crankshaft bearings, and to others feeding the valve tappets. Again, a quantity of the oil falls into holes on the big end bearings and into troughs at the lower ends of the cylinder bores and pistons, which carry the film of oil up the cylinder walls, while the lubricant which has been splashed into the pistons serves to lubricate the small ends of the connecting rods.

(2) **Splash and Pressure.** This is a system also employing troughs under the big end bearings, but leads from the pump are also taken to the main crankshaft bearings and sometimes to the camshaft bearings as well, thus providing a supply of oil under pressure to these important points. The

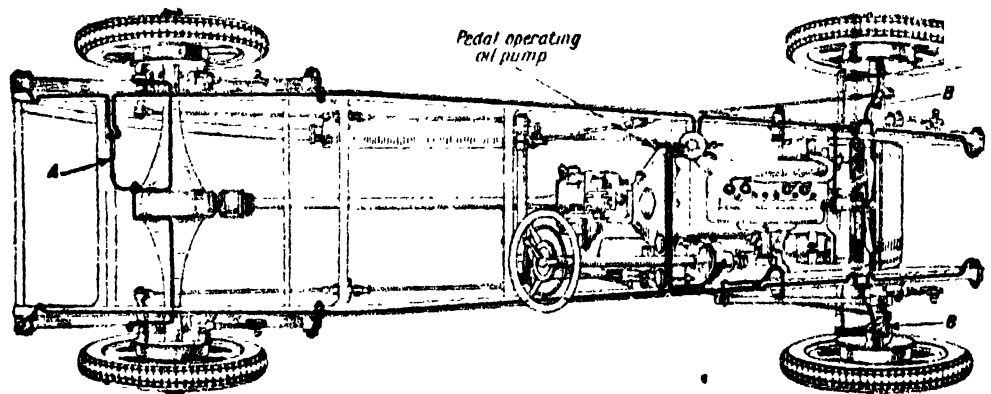
reciprocating parts are lubricated in the same manner as described in the circulating splash system.

(3) **Full Pressure Lubrication.** The pump delivers oil under pressure to the main bearings, and from the interior of these it passes into channels bored in the crankshaft, which communicate with similar channels in the crank pins. Thus the big ends are lubricated from within. Similar channels take oil under pressure up ducts in the connecting rods to the small end bearings. Surplus oil from these bearings is thrown off on to the cams, cylinder pistons, etc.

Oil Consumption. The quantity of oil consumed in a motor vehicle depends largely upon the size and general efficiency of the engine, but an average of 1,000 miles to the gallon is regarded as a satisfactory consumption in a modern engine. If the oil level indicator in the sump indicates that there is a good supply after a considerable mileage has been covered, it is desirable to drain the crankcase and refill with fresh oil, as oil which has been used over and over again for long periods loses its viscosity. Moreover, it becomes contaminated with particles of carbon and with other impurities.

Special oils are now sold which have a high flash point and are known as upper cylinder lubricants. These oils are used additionally to the main supplies and are usually mixed with the petrol, and so amount to the fuel a lubricating quality which serves to keep the valve stems well lubricated. Separate containers for this upper cylinder oil are fitted on some cars.

Gear Box and Back Axle. Lubrication of the gear box and back axle (which contains the differential gear) consists mainly of making



Lubrication for Motor Vehicles. FIG. 1. Lubrication of a car chassis: Teoslemitt central system. Arrangement of pump and pipes, the latter shown in thick black lines. A, flexible tube from frame to axle. B, connexions to front wheels.

sure that these important parts have an adequate supply of oil. The lubricant should never be allowed to be too much below the level specified by the makers. The level should not fall appreciably in 1,500 miles running.

Most cars are equipped with level-plugs (which are removed when filling the gear box or the rear axle) to indicate, by overflowing, when the correct level has been reached. An excess of oil in a rear axle may cause the surplus to find its way on to the brake drums and so render the brakes useless. Careful attention should be paid to worn drive back axles, especially to those which have the worm on top of the wheel; any shortage of oil here will quickly render the drive inoperative.

Lubrication of the Chassis. Certain bearings on a car chassis require lubricating more frequently than others. The points needing periodical attention are the spring shackles and pins, the joints of the steering rods, the brake operating gear and the front axle steering pins. The modern method of lubricating these parts is through grease-ways supplied with grease by means of a pressure gun. The appropriate grease should be forced into the nipples on the bearings until some of the grease exudes from the end of the bearings.

In some cases there is a separate nipple which is filled for each bearing, in others several bearings are fed by a group system from single nipples, and in a few from a central point, this feeding all the bearings.

Front wheel hubs require infrequent replenishment, but once every six months they should be given a fresh supply of grease to prevent the balls or rollers on the bearings from corroding. The steering box, too, should not be neglected, and should be tightly packed with a mixture of oil and grease.

Motor Cycle Engines. Owing to the limited space available in a motor cycle the flywheels of the engine are usually enclosed in the crankcase, and there is seldom room for a sump in its base. In most four-stroke motor cycle engines a slow speed oil pump, driven off the timing gear, is used to supply oil in minute quantities from a reservoir to the crankcase, where it is used on the splash system, or it is carried to the big-end bearing. Hence it is distributed on the cylinder walls, and, through a hole in the partition separating crankcase and valve gear casing, to the valve gearings and tappets.

A few motor cycle engines embody a sump, in line with the practice in car engines, the pump being used to circulate the oil from the sump, through the bearings, and back to the sump. In what is known as the dry-sump system a pump serves to supply oil under pressure to the various parts of the engine and

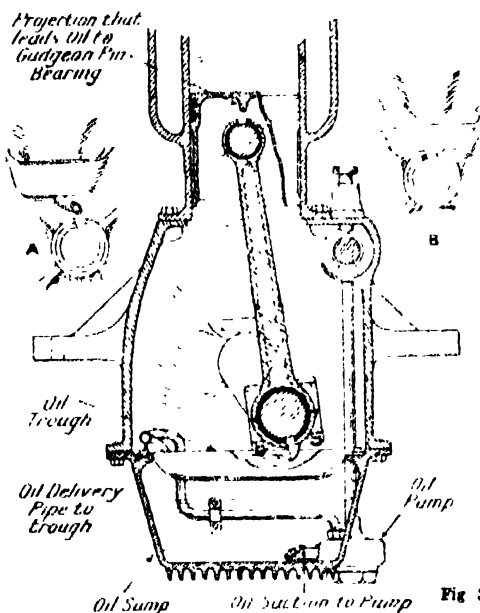


Fig. 3

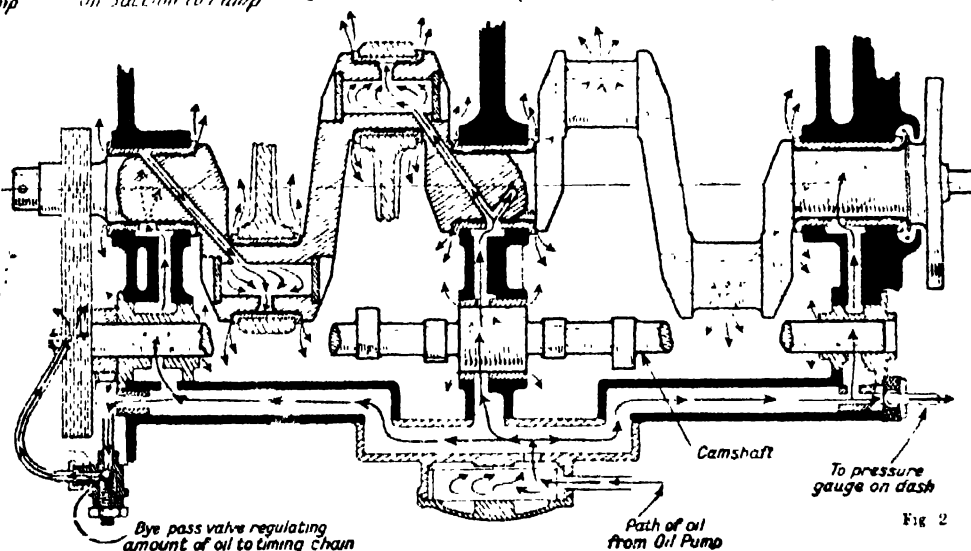


Fig. 2

Lubrication of car engine. Fig. 2. Diagram of fully forced system. Crankshaft is sectioned to show oil passages. Arrows indicate the path of the oil. Fig. 3 (above). Splash system, in which dipper on connecting rod cap dips into oil trough. A, oil collector or reservoir, with feed pipe to bearing. B, oil collector cast in one with bearing.

covered with a film of oil. If the engine is allowed to stand too long with the supply tap open, there is a possibility of the oil, heavier of course than the petrol, settling in the carburetter and so making starting difficult. Experience has shown that much trouble may be avoided if the supply tap is turned off a little while before the engine is stopped, in order that the float chamber of the carburetter is not left with a supply of the petrol mixture, as it is called.

LUGGAGE.

Every passenger by train in Great Britain is entitled to have a certain

also to return the surplus to the outside reservoir.

In two-stroke engines it is usually the practice to mix the oil with the petrol, the mixture varying from 30 parts petrol to 1 of oil when the engine is new, to 16 to 1 when the bearings and piston have been well run in. In this system no other provision is made for lubricating the engine. It is a simple, if crude, method of supplying oil to rapidly moving parts, but is quite satisfactory except that the carburetter is usually

quantity of luggage carried free of charge, the amount varying with the class of ticket. Anything exceeding this weight is paid for at a fixed rate per lb. Passengers are responsible for their own luggage to the extent of seeing that, having been correctly labelled, it is put into the right train, but if the company's servants once take charge of a package the company is liable for its safety.

On British Railways luggage can be sent in advance at a fixed rate per package on production of the passenger's ticket. The charge includes collection and delivery, and notice should be given at least one day before.

Travelers by motor coach are allowed a certain amount of luggage, although this is usually confined to suit cases and bags that can be carried in the hand.

Travelers by air are allowed a fixed amount of luggage by weight, everything above the weight being charged at excess rates.

Travelling Abroad. For continental travel the systems vary. In some countries each passenger is allowed a certain weight of luggage free and pays on the surplus, while in others all luggage except that actually taken in the carriage must be paid for. Luggage can

be registered from the station from which the boat train leaves, and it requires no attention on the passenger's part until he reaches his destination, unless he has to submit to customs examination on crossing the frontier between two countries. For sea voyages each passenger can take a certain amount of luggage in the cabin, and the rest goes in the hold, the cost of transporting a passenger's permitted quota being included in the passage money. It is admissible to insure luggage during transit, and this can be done through the transporting concern or any of its agents.

Some Legal Points.

The legal duty of the passenger consists solely in delivering his luggage

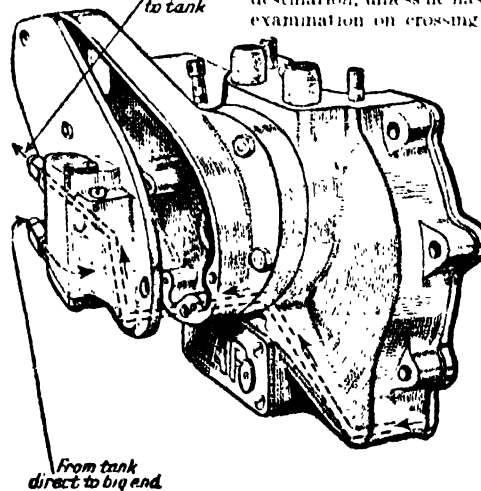


Fig. 4. Lubrication of motor cycle engine. Dry sump system as applied to a single cylinder J.A.P. engine. Courtesy of The Motor Cycle.

to a company's servant with directions where he wishes it to go. The company must then label it and send it on, and all the passenger has to do is to claim it at its destination.

The luggage a passenger is entitled to carry free must be personal luggage, that is, such things as are ordinarily taken by a traveller for use as a traveller. If articles of merchandise are delivered to the company as passenger's luggage and are lost, the company is under no liability. They are bound to accept personal luggage up to the proper weight if properly packed, and can refuse to accept a package not addressed, but if they accept a package which is not addressed they are responsible for it. It is best to have luggage put in the guard's van; for if a passenger takes luggage with him into the carriage, to some extent he relieves the company from responsibility for its safety.

British Railways can make special conditions as to liability for the carriage of luggage by cheap or excursion trains. They are not entitled to make any special regulations exempting themselves from liability when ordinary fares are paid. If a servant carries luggage for his master as his own personal luggage, the master has no claim for its loss; and the servant cannot claim, because he has suffered no damage.

It should be noted that if the passenger has over £25 worth of articles, e.g. jewelry, etc., in his luggage, and fails to declare them, and they are lost the railway authority is not liable, and the loss falls on the owner unless the luggage is insured. Insurance policies are obtainable for the period of a journey.

LUMBAGO: How to Treat. Pain in the loins, or lumbago, is commonly due to fibrositis, or inflammation of the sheaths of fibrous tissue surrounding and covering the muscles of the back. The fibrous tissue swells at various points and presses on nerves, giving rise to pain, which may be very sharp.

The exciting causes of an attack are cold, damp, exposure to draughts when perspiring, and muscular strain. Predisposed persons should harden themselves by a daily cold bath or sponging, and by not wearing too warm clothes. But in cold weather the small of the back should be protected.

A Turkish bath will often avert an attack. Rest in bed is advisable. Apply a large, hot linseed poultice, or wring a folded piece of flannel out of hot water, sprinkle it with turpentine, and put it to the back, renewing it as it cools. Dry heat can be applied by half-filling a large rubber water-bottle with hot water and placing it against the part, or a piece of flannel can be applied and rubbed over with a hot flat iron.

An attempt should be made to discover the swellings on the inflamed tissue, and these should be kneaded with the thumbs, very gently to begin with, but with increasing firmness as the patient is able to bear it.

The bowels must be kept regular by occasional doses of some saline aperient. At the commencement of an attack, a powder containing 5 grains each of aspirin and phenacetin can be taken several times at 3 or 4 hour intervals. Friction with stimulating liniments, such as turpentine liniment, or with Chilli paste, is useful as the acute stage passes.

LUMINOUS PAINT. This is paint to which has been added a small proportion of radio-active material such as radium or zinc sulphide phosphor which will glow in the dark. It is very costly, and its use is more or less limited to painting the hands and numbers on watch and clock dials. It is sometimes embedded in plastic light switches, key-holes, etc., so that these can be found in the dark.

LUMP. A swelling somewhere about the body is popularly referred to as a lump. In the neck it is usually an enlarged gland, the

commonest cause being tuberculosis. A lump in the breasts may be due to inflammation, or to cystic or tumour formation.

Much harm results from women delaying too long to get medical advice about such a lump.

In the groin a lump is generally a hernia or rupture, but might be due to enlarged glands or other causes. See Gland.

LUNAR CAUSTIC. Nitrate of silver, commonly known as lunar caustic, is used to remove warts and cauterise wounds. In cases of poisoning give a tablespoonful of salt in a pint of water, or the whites of 2 or 3 eggs beaten up in a pint of water. See Wart.

LUNATIC: The Legal Position. A lunatic is a person suffering from mental disorder, and under English law he or she can be placed in a mental hospital after certain formalities have been complied with. There are several forms of procedure. The ordinary method is by a reception order or petition, this being the one usually adopted with private patients where urgent action is not essential.

Four documents are required, these being the petition itself, a statement of particulars, and two medical certificates. The petition must be signed, if possible, by the husband, wife, or nearest relative of the alleged lunatic. If this is not done, the reason for another person signing it must be given. The signer of the petition must, moreover, have seen the patient within 14 days of the date of the petition. Attached to the petition is a statement of particulars. This must contain the name, age, sex, and occupation of the person, with details of his or her present illness and any previous attacks of mental disorder.

Most important are the two medical certificates, one of which should be signed by the usual medical attendant of the alleged patient. Each of the medical men must examine the patient, separately from the other, within seven days of the date of the petition.

The Medical Certificate. A medical certificate cannot be given by the petitioner himself, by the superintendent, proprietor, or medical attendant of the mental hospital to which the alleged patient is to go. It cannot be given by any person interested in the payments on account of the patient, or by the husband or wife, father or father-in-law, mother or mother-in-law, son or son-in-law, daughter or daughter-in-law, brother or brother-in-law, sister or sister-in-law, or by a partner or a servant of any of the foregoing.

One paragraph of the medical certificate requires two statements: "Facts indicating

insanity observed by myself at the time of examination," and "facts communicated to me by others." The statements made under the first heading are the most important part of the certificate, and unless these contain evidence sufficient to convince an independent reader that the person to whom the certificate refers is mentally disordered, the certificate will not be regarded as sufficient. A medical man who signs a committal certificate is not allowed to continue to attend the patient. He is not liable to civil or criminal proceedings for any statement made therein, unless it can be proved against him that he has not acted in good faith and with reasonable care.

When they are completed the petition and other documents must be taken before a judicial authority, who is either a county court judge, a stipendiary magistrate, or a justice of the peace, specially appointed for the purpose. This authority, if satisfied with the evidence set forth, may sign the reception order forthwith, or may appoint a day, not more than seven days after the presentation of the petition, for its consideration, and may himself visit the patient.

Urgent Action. When it is urgently necessary, either for his own safety or for that of others, that a person should be put under restraint at once, the method of procedure is by an urgency order. This can be signed by the husband, wife, or other near relative of the alleged patient. If anyone else signs it, the reason for so doing must be given. The person who signs must have seen the patient within two days of the date of the order. A person can be detained under an urgency order for only seven days.

If it is desired to put him under permanent restraint, a petition must be presented in the way already described, and he can be detained until this is settled. Slightly different forms of procedure are followed when the patient is wandering at large or is a pauper; for one not under proper care or control; for one who is cruelly treated or neglected by those in charge.

Two commissioners in lunacy can sign an order for the detention of a patient in a recognized mental home even if there is only one medical certificate.

When once certified as insane, a patient must be placed in a mental hospital that is under the supervision of the lunacy authorities, and if the relatives are dissatisfied with his or her treatment there, an appeal can be made to the officials of the Board of Control, whose headquarters are at 32, Rutland Gate, London, S.W.7. See Insanity.

LUNCHEON AND LUNCHEON PARTY

Dainty Catering for Family and Guests

This is a companion article to those on Dinner and Supper. Dining Room and Table Laying may be further consulted by the housewife. Mat., and the articles on Diet.

See also the entries on Embroidery; Glass, Food; Picnic; Salad; Sandwich.

The family luncheon on Sunday, or every day where there are children, is a more substantial affair than the light lunch usually served when dinner is the chief meal of the day. The tendency, both because of cost and choice, is to simplify midday fare, and, especially in the summer, have light dishes instead of the elaborate meat and sweet courses once popular. Two or three times a week fish is served instead of meat for the children, and plenty of stewed fruit or fresh fruit salads and light junkets or custards are substituted in hot weather for the sweet puddings so valuable as heat-producing food in the winter.

Variety is essential for healthy enjoyment of meals, and menus can be thought out by the housewife before the beginning of each week. The huge Sunday joint which used to supply cold meat on Monday and two or three made-up dishes for the next day or two (of little food value in comparison with the

trouble of their preparation) may have saved some effort of imagination, but it is far more profitable and interesting to evolve a series of appetising and well-balanced meals. Such forethought (and acquired knowledge) makes all the difference between drudgery and gratifying efficiency.

Children's Midday Meal. Particularly suitable for substantial luncheon dishes in the winter, accompanied by vegetables in season, are corned beef pudding or pie, Irish stew, casserole stews with plenty of vegetables or, when available, minced steak, liver, sausages, and mashed potatoes. Boiled cod or hake with parsley sauce, grilled herrings, dried haddock, fish pie, and baked whiting filets, are all excellent substitutes for the meat course with or without a nourishing soup, according to the selection of sweet to follow. For instance, if a boiled jam roll or apple pudding is selected, the soup would not be required; but if stewed

fruit or merely an open jam tart is on the luncheon menu, then, on a cold winter's day, Scotch broth or brown vegetable soup will form an admirable beginning to the meal.

In summer, egg dishes when available are light and nourishing for children, particularly in the form of poached eggs on a vegetable such as spinach or runner beans. Suggestions for wholesome fish and meat salads will be found in the article on salads. These are more appetising on a warm day than hot food. Luncheon in the garden is a pleasant meal to return to from school, and the service of this is facilitated by a trolley wagon laden with one simple hot dish in a casserole or a substantial cold one, and cold sweets. Those inexpensive fruit sets of one big bowl with its smaller companions are attractive and useful adjuncts for the summer pudding course out of doors. Lemonade, pineappleade, and orangeade are excellent and popular luncheon beverages.

For children who have to take their lunch to school, neat little cases are obtainable either for sandwiches only, or if something more elaborate is required, fitted with cup and saucer in unbreakable ware, and a vacuum flask, and a sandwich tin.

Some nourishing fillings for sandwiches are described in the article on Sandwich. Oat-cake and "spread" cheese, dates, raisins, celery, tomatoes, and apples are all useful varieties of food for the luncheon case. Hot soup in the flask makes a pleasant change in winter. Cold malted milk or a fruitade, in a wicker-cased bottle, are liked in the summer. A portion of some kind of sandwich cake makes a good sweet, with a custard tart or an iced bun for a change.

The elaborate family luncheon of the Victorian Sunday has now become the much less elaborate Sunday midday dinner, thus leaving the housewife with more leisure in the evening. Cold dishes can be added to the menu in hot weather, joints can be sufficient for the day, the evening supper requiring a certain amount of left-over cold meat. Poultry, offal, and rabbit all help to make a main luncheon dish.

Many men if they are at home for lunch on a summer weekday really prefer a salad, bread and cheese, and beer, to a made-up entrée. They will often fancy a dish of hors d'oeuvres with a variety of tinned meats. In winter a good fish or meat curry is an excellent luncheon dish, while many people who prefer a light meal serve a vegetable or macaroni au gratin as the main dish.

Entertaining to Luncheon. Many housewives prefer to entertain their friends to luncheon rather than to the more elaborate meal of dinner. Sometimes such a luncheon is given before an afternoon's bridge, or a matinee, at others it is a pleasant way to seeing people who come from a distance. Visitors to luncheon on Sunday entail very

little extra work in the household where a substantial midday meal is usually prepared on that day. It is always a mistake to give too formal a character to a luncheon party, and this in itself renders service easy and makes it simple for the hostess to entertain guests in a friendly fashion who are much better off than herself. There need be little or no waiting at table.

However simple the fare the first requisite is that it should be good of its kind, the second



Luncheon. Charming effect of a polished table laid with a dainty lace luncheon set and cut glass service

Courtesy of Webb & Co.

that the table service should be dainty. Some women prefer the all-over damask cloth, others lace or embroidered mats. As indicated in our illustration, a lace centre and mats show off beautiful glass to perfection, and an antique shade of lace looks particularly well on a dark polished table. In this case the table is laid for service from dishes handed round from a side table by the hostess. The lace mats are protected by thin cork ones finished in cellulose to match the shade of the table. The effect would be spoilt if another colour intervened.

One solid course is enough as a rule at luncheon, and three or at the most four courses in all. Grape fruit, a fruit cocktail, melon or soup, are a suitable choice for the first course. Either of the first two would be served in glasses, the melon on a glass plate, and the soup in cups or small two-handled soup bowls. Sometimes in hot weather the soup is served iced. One of the small individual salads mentioned in the article on Hors d'oeuvres also makes an excellent first course for a luncheon party. Smoked salmon, salmon or prawn mayonnaise look appetising on glass plates.

When fruit is the first course a fish or egg dish may follow either hot or cold, as taste and season of the year may decide. Meat rissoles and peas, salmi of game, casserole of chicken, beef tournedos or jugged hare are dishes which obviate the task of carving for the hostess. Vol-au-vent and various patties are often liked. Salads form a most useful series of helpful suggestions for the various courses of this meal. An iced sweet, where this can be made at home, is nearly always

appreciated and petits fours may be served with it. With regard to beverages, ideas vary. Some people offer red or white wine in the winter, with whisky and beer in reserve for men who prefer them. In summer it is often enough to serve either a cider or a white wine cup, iced lemonade, ginger beer, or beer. Many people never take alcoholic drinks at all others never in the middle of the day. Coffee should be provided after luncheon (for those who take coffee), and also cigarettes.

The Luncheon Set. Designs for luncheon sets consisting of a table centre and mats vary greatly in materials, colours and shapes. Sometimes three small mats go to each individual place at the table: one for the glasses used, one for the bread plate, and one for the plate on which the course is served. Sometimes these three are combined in one oblong or oval mat large enough to hold both plates and glass. These larger shapes look particularly well in antique embroidered linen or in coloured linen decorated with applique motifs.

Designs for Irish crochet suitable for luncheon sets are obtainable in various books on crochet and through needlework pattern services. For a cottage set, coloured linen, canvas or raffia cloth mats are charming. They may have borders and floral designs embroidered in wool or raffia. Coloured American cloth bound with bias binding to match and decorated with applique cretonne flowers is also a good fabric particularly for an informal luncheon on a garden table or in the loggia.

LUNG. The lungs are two organs conical in shape, and of a spongy and very elastic substance, which fill the greater part of the chest cavity, and which contract or expand as the air is expired or inspired. The air passages in the lungs are termed bronchi. Each lung is surrounded by a double layer of serous membrane forming the pleural cavity. The right lung is divided into three lobes and the left lung into two. It is in the lungs that the blood changes its colour from the dark purplish red of venous blood to the bright red colour of arterial blood.

Diseases of the Lungs. Acute congestion of the lungs accompanies pneumonia and other inflammatory diseases of the lungs or tubes. Passive congestion is common in disease of the heart when the return of the blood from the lungs is obstructed.

Bleeding from the lung occurs in pulmonary tuberculosis, pneumonia, infarction and other disorders. An abscess in the lung may occur in pneumonia, in pulmonary tuberculosis, or from embolism.

Bronchitis consists in inflammation of the lining of the bronchi. When one or more of the bronchi become enlarged, bronchiectasis is said to be present. Emphysema is the name given to the dilatation of the air cells in the lung. One or both lungs may be affected.

Collapse of the lung is a condition in which parts of the lung contain no air and are useless for the purpose of respiration. An instance of this frequently occurs in broncho-pneumonia, especially in children, and may be signalled by the child's becoming suddenly very short of breath, while the lips become blue. Should this occur while awaiting the doctor, who should be summoned at once, the child must be placed in a warm bath and quantities of cold water should be thrown on the chest at short intervals, in order to induce deep inspirations. See also Breathing; Bronchitis; Emphysema; Empyema; Inhalation; Pleurisy; Pneumonia; Tuberculosis.

LUNGWORT. This is the common name of a hardy spring-flowering borage-like plant of low growth (pulmonaria), which flourishes in ordinary soil. The spotted leaves are ornamental. *Angustifolia*, 12 in., flowers blue;

arvensis, 9 in., blue; rubra, 12 in., reddish, and saccharata, rose-pink, are some of the chief kinds. They are increased by division in early autumn.

LUPIN. The perennial lupin is one of the loveliest hardy garden flowers of May and June. In recent years many new varieties



Lupin. Tall spikes of blossom of the handsome perennial lupin

have been raised of charming and varied colouring — yellow, fawn, apricot, crimson, rose, pink, etc. Some of them have been given names, but a mixed packet of good seeds will yield splendid varieties.

The lupin needs deeply dug and manured soil to be seen at its best, there, in the course of a year or two, it will develop into a large clump and will bear dozens of flower spikes. It thrives in partial shade or in a sunny place, and is planted in autumn or spring. After a few years the plants are liable to deteriorate, but fresh ones are easily raised by sowing seeds out of doors in May; the seedlings will bloom in the following and succeeding years. Lupinus must not be lifted and divided. The finest modern varieties are the Russell lupins; they have exceptionally beautiful flowers.

The annual lupins are pretty plants, 2 ft. or so high, which bear flowers in blue, rose, and other colours. The showiest is atrocaeruleus, with red and white blooms. Seeds are sown out of doors in April, where the plants are to bloom in summer.

LUPUS. The skin disease known as lupus, which is the Latin word for wolf, received its name from the eating away of the tissues which often occurs in lupus vulgaris, one of the two forms of the disease. The other form is lupus erythematosus, which most commonly appears on the bridge of the nose and the cheeks, in what is termed butterfly distribution, covering them with red spots and greyish or yellow shiny scales. Septic conditions of the mouth or poisoning from some other source appears to have much to do with the cause of this form of lupus. The tubercle bacillus is the cause of lupus vulgaris, which is a very chronic form of tuberculosis of the skin.

Treatment consists in destroying the diseased parts by the application of germ-killing drugs or chemical caustics, removal by the knife, light treatment such as Finson rays, X rays, and radium. See Light, X ray.

LURCHER. Generally a cross between a greyhound and a collie or some other sheepdog, the lurcher seems to unite the virtues of each, with an added spice of mischief. Some are so trained that to all appearances they have nothing to do with their masters if a gamekeeper or poacher happen to be met. A lurcher will hunt for game, catch hare or rabbit, and retrieve it without fuss to the hand of its owner. See Dog.

LUSTRE WARE. Pottery is said to be lustred when a part or the whole of its surface is coated with a metallic film, which imparts to it a resplendent sheen. The earliest lustre was the

silver. The lustre decoration introduced into Staffordshire in the 18th century is seen at its best in some Wedgwood ware, and was manufactured at Newcastle, Sunderland, Leeds, and Swansea. It was produced by means of solutions of metallic salts principally platinum which gives the so-called silver lustre, gold which is the basis also of metallic pinks and purples, and copper. Sometimes the whole surface was coated in order to impart the appearance of plated ware, a style which went out of use when electroplating was introduced and electro-plated ware became popular.

Bismuth was used in Paris for producing an iridescent film resembling mother of pearl, and pearly ware of similar appearance is well known to collectors of Belleek and Lill Worcester. These modern English wares, as well as the cheap continental productions of Belgium, Holland, and elsewhere, lack the true refulgence and gleam of the older lustre pottery. But apart from these there are available admirable reproductions of much excellence, both from modern Italian studios, and also among English craftsmen, whose work may be collected.

Lustre decoration tends, more or less, to wear off. It should be cleaned with great care without the use of hot water. The silver lustre made a century ago is sometimes resilvered, when intended for occasional use.

LYCASTE. This beautiful and easily managed winter and spring-flowering orchid can be grown in a greenhouse having a minimum winter temperature of 50 degrees. It should be potted in a mixture of loam, peat and sand and is propagated by division as soon as the flowering season is over. The favourite kind is Lycaste skinneri, which has blooms of deep blush or rose-red shade; the white variety, alba, is beautiful. Many others are in cultivation.

LYCH GATE. This is, properly, a roofed gate at the entrance to a churchyard, where at a funeral the coffin awaits the officiating clergy.



Lych Gate in domestic architecture. Fig. 1, with tiled roof; working diagrams and dimensions are given in Fig. 2. At Fig. 3 is a chequerboard lych gate and fencing of the same type



Lustre Ware. Two-handled goblet, dating from about 1850

man. There is a stone slab on which the coffin rests. In domestic architecture a lych gate forms an ornamental approach to a house. One which the amateur might construct is shown in Figs. 1 and 2. The necessary dimensions are indicated on the diagrams.

The best wood is oak, but well seasoned deal may be used. Such a structure, if roofed with dark red sand-faced tiles and neatly finished, forms an attractive external feature of the home. Fig. 3 shows a chequerboard lych gate used in conjunction with fencing

of the same type

See Gate; Roof

LYCHNIS. This is the botanical name of a group of hardy summer-flowering plants which includes many of considerable garden value. The Jerusalem cross (Lychnis chalcedonica), 3 ft. high, with scarlet flowers, is a favourite border plant. Lychnis (agrostemma) coronaria, 2 ft., which has grey leaves and carmine flowers, is a splendid plant for the shady border. Haageana, 12-15 in. high, is very handsome; it needs well drained, rather light soil. There are several varieties of this with flowers in scarlet, rose and other colours. Viscaria (ll. pl.), 12 in., with rose-red flowers, is very showy. Alpina, 4 in., reddish, and lagascae, 4-6 in., rose, are suitable for the rock garden. The double white variety of Lychnis vespertina has fragrant flowers. Lychnis flos cuculi is the wild ragged robin. Although the perennials may be increased by division in early autumn, the best way is to raise them

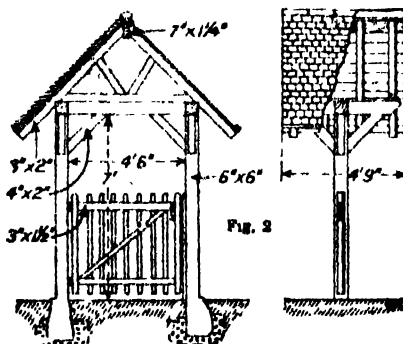


Fig. 2



from seeds sown in boxes of soil in a frame in May. The annual campion (*coeli-rosa*), 15 in., which bears rose-purple flowers, is sown out of doors in spring for summer bloom.

LYCIUM. The box thorn is a quick growing hardy shrub with slender branches, especially well suited to seaside gardens. *Lycium chinense*, the favourite kind, has small purple flowers followed by red fruits. Propagation is by cuttings in autumn or by seeds sown in a frame in spring.

Lycopersicum. This is the botanical name of the tomato (*q.v.*).

LYCOPODIUM. *Lycopodium*, or club moss, is the name of a group of hardy and greenhouse perennials of somewhat moss-like growth. The hardy kinds, e.g. *clavatum* and *alpinum*, need moist peaty soil in the bog garden or rock garden. The greenhouse kinds need peaty compost and moist shady conditions; *densum* is one of the best.

LYE. The cleansing substance, or bleacher, known as lye, is a solution obtained from ashes or from substances which contain alkali, and is used in the preparation and making of soap, and as a detergent. A useful lye can be made from two parts salt and one of caustic soda. These are mixed dry, and then diluted with water, the solution being employed for scrubbing or scouring purposes. As caustic soda has an injurious effect upon the skin, the hands should be kept free from contact with the solution. *See* Bleaching.

LYGODIUM. This is a climbing fern suitable for cultivation in a heated greenhouse, in a compost of half loam and half peat with sand mixed in. The favourite kind is *Lygodium scandens*; it may be trained to cover a pillar or wire trellis.

LYSOL. One of the cresol antiseptics derived from coal tar is lysol, which is used in the home as a disinfectant. A 2 per cent solution in water is commonly made. The strong solution is very poisonous. In cases of poisoning, while awaiting the doctor, white of egg or oil may be given, but not water. *See* Antiseptic; Cresol; Disinfectant.

MACARONI: How to Cook. Macaroni is made from wheat finely ground and made into a stiff paste with water, which is squeezed out into long pipes through a hollow, cylindrical vessel. During this process the macaroni is partially baked, and is afterwards allowed to dry over artificial heat or in the sun.

Macaroni is cooked by being plunged into boiling water, which must continue to boil quickly, and should be well salted. About half an hour is the time usually required for boiling. The pipes should keep their shape and be quite soft. The macaroni is then drained and is ready for use.

For thickening soup, use 2 oz. cooked macaroni to about a quart of stock. It should be added to the soup almost at the last, brought to the boil, and boiled for about 5 min.

Macaroni with tomatoes makes a nutritious dish. Boil 4 oz. macaroni and make a tomato purée by rubbing a tin of tomatoes through a sieve. Let it boil up with a tablespoonful of butter melted with the same quantity of flour and seasoning. Add the macaroni and boil it up. The macaroni and tomato can be put in a greased pie dish with breadcrumbs and pieces of margarine on the top, and placed in the oven for about a quarter of an hour.

Macaroni also combines well with fish. Have ready any boiled white fish and flake it, removing all bones and skin. Boil the macaroni, using about $\frac{1}{2}$ lb. macaroni to 1 lb. fish. Grease a pie dish and place in it first a layer of fish then a layer of macaroni, continuing these layers until the dish is full. Seasoning should be sprinkled over each layer. Add a sprinkling of grated cheese and

breadcrumbs on the top, and pieces of margarine, and bake it for about 20 min.

Another appetizing dish consists of boiled macaroni and kidney. Split and skin three sheep's kidneys, and fry them in 1 oz. smoking hot fat; then lift them out, and in the same fat lightly fry a tablespoonful of chopped



Lygodium. Foliage of a climbing fern which is effective for training up a pillar.

onion. Stir in 1 oz. flour, and when the mixture is deep brown add the water in which the macaroni was cooked. Stir the whole until it boils and forms a smooth sauce, then strain it into a saucepan and add the macaroni and the kidneys cut into quarters. Season and simmer for 10 min., then serve on a hot dish.

Macaroni cooked according to Italian methods may be prepared from $\frac{1}{2}$ lb. macaroni, 1 oz. grated cheese, $\frac{1}{2}$ pint tomato pulp, 1 oz. butter or margarine, and seasoning. Break the macaroni in $\frac{1}{2}$ in. lengths, put these into a saucepan of rapidly boiling salted water, and boil 30-45 min. Strain off the water, and add to the macaroni the sieved fresh or tinned tomato pulp, and a little seasoning.

Cover the pan and stir its contents over slight heat until the macaroni has absorbed sufficient tomato pulp to render the mixture thick and creamy. Add two-thirds of the cheese and butter and turn the mixture into a greased fireproof dish. Shake the remainder of the cheese over the top, and place here and there small pieces of butter or margarine. Bake the whole until the top is lightly browned, and then serve it with bread and butter.

A good cold sweet in which macaroni is an important ingredient is made by placing in a deep glass bowl alternate layers of stewed fruit and juice and cooked macaroni cut into short lengths. About two breakfastfuls fruit and 4 oz. macaroni will be required. Let the last layer be of macaroni, and over this pour $\frac{1}{2}$ pint of custard, sweetened and flavoured to taste. Decorate with glace cherries.

Macaroni Cheese. A popular way of cooking macaroni for a savoury dish is to make macaroni cheese, or macaroni au gratin. For a dish to serve 4 people, boil 1 oz. macaroni till tender, and break it into small pieces after draining well. Melt 2 oz. margarine and stir in a tablespoonful of flour. Add a pint of milk and bring to the boil, stirring all the time. Add 4 oz. grated cheese and stir until it becomes soft. Season well, and stir in a teaspoonful of made mustard. Grease a pie dish and place the macaroni in it. Pour the cheese mixture over it and sprinkle the top with breadcrumbs, grated cheese, and two or three pieces of margarine. Bake in a quick oven until brown, and serve very hot.

Macaroni Pudding. To make a baked macaroni pudding, boil until tender 1 oz. macaroni in a pint of boiling milk. Then draw the saucepan to the side of the heat and add 2 well beaten eggs, sugar to taste, and any desired flavouring. Stir over gentle heat for a few minutes, then put the mixture in a greased dish and bake for about $\frac{1}{2}$ hour in a slow oven.

MACAROON. The almond flavoured biscuit known as a macaroon is made by mixing $\frac{1}{2}$ lb. ground almonds with 1 oz. rice flour and 10 oz. castor sugar, and adding the whisked whites of 5 eggs and a few drops of flavouring. Spread the mixture evenly on water papers, using about one dessertspoonful for each macaroon. Blanch $\frac{1}{2}$ oz. of sweet Valencia almonds, split each into four, putting a piece in the centre of each macaroon after brushing the latter over with water. Bake the biscuits in a moderately hot oven for about 20 min.

Macaroon Jelly. A pint packet of red jelly, some macaroon biscuits, and fruit, are the chief ingredients required for this sweet. Arrange 8 medium-sized biscuits in the bottom of a glass or silver dish with a few small pieces of tinned pineapple and a banana split into 6. Dissolve the jelly in a pint of hot water, pour this over and leave the whole to set. Whisk the white of an egg to a stiff froth and mix it with a gill of whisked cream, adding a dessertspoonful of castor sugar. Shake this on top of the jelly and in the centre place glacé cherries and a few pieces of pistachio nut.

Macaroon Tart. Line tartlet tins with short pastry. In the bottom of each tart put a teaspoonful of jam, cover it with the macaroni mixture, as given for making macaroon biscuits, and brush over the top with cold water. Cut some small thin strips of pastry, place two crosswise on each tart, and bake in a hot oven for 15 or 20 min. *See* Pastry.



Macaroon Tarts, a popular pastry for Sunday supper.

MACARTNEY ROSE. This vigorous, almost evergreen, rose (*Rosa bracteata*) was introduced from China by Lord Macartney. The Macartney rose bears large single white flowers and is suitable only for planting against a sunny wall.

MACASSAR OIL. A good hair dressing of this type can be made as follows. Reduce 1 oz. alcanet root to a coarse powder, in an iron mortar, and pour upon it 1 pint pure olive oil. Warm the oil, stir it occasionally, and, after an hour, strain it through fine muslin. When the oil, now coloured red, is cold, add the perfume, which is made in the following way: lemon oil, 15 drops; cinnamon oil, 10 drops; clove oil, 10 drops, and geranium oil, 2 drops.

MACE. Similar in its properties to nutmeg, mace is a highly aromatic condiment that is procured from the membrane surrounding the shell of the nutmeg. It is prepared by separating it from the nutmeg as soon as the latter is ripe, and is dried by the sun and pounded to powder. Mace is chiefly used in the flavouring of savouries. *See* Nutmeg; Savoury.

MACEDOINE. This term denotes a mixture of vegetables or fruit, usually cut into dice or small pieces. Macedoine of vegetables, which is sometimes used to garnish meat, can be bought or made at home from carrot and turnip cut into dice, fresh or bottled green peas, French beans cut into short lengths. All these must be cooked before being cut up, and then re-heated together in a little butter, and seasoned to taste. If a cold dish is being prepared, they may be mixed with mayonnaise instead of butter.

Macedoine of fruit consists of grapes, canned pears, apricots, pineapple, etc., cut into small pieces, and set between layers of jelly. See Jelly.

MACKEREL: How to Cook. This fish should never be eaten unless absolutely fresh; it is in season from June to August. When fresh, the fish has a beautiful bright colour, the flesh is firm, the eyes clear, and the tail stiff and unbending. It can be cooked in a variety of ways, and the roe should be served with the fish or added to the sauce.

Baking is a favourite method of cooking. Use two good sized mackerel and clean them, removing the heads and roe. Boil the roes in salted water, then chop them, mixing in a tablespoonful of chopped parsley, a sprinkling of thyme, and pepper and salt. Add half teaspoonful breadcrumbs and bind all together with a beaten egg. Split the mackerel and stuff with the preparation. Brush the fish with olive oil or melted butter, cover it with bread crumbs and bake it until it is nicely browned. Serve with anchovy sauce.

To broil mackerel, clean and wipe the fish and split it down the back. Wipe a little olive oil over the fish, and smear the bars of the gridiron with suet. Rub over the back of the mackerel a little chopped parsley mixed with a nut of butter. Broil slowly over gentle heat for about 20 to 30 min. Serve with fennel sauce.

To fry mackerel, prepare the fish as for broiling, sprinkle it with flour and fry it in butter, over gentle heat, until nicely browned on both sides. Serve with anchovy or bechamel sauce, or with parsley butter. It can be fried in fillets; these should be dipped in egg and breadcrumbs before being fried.

Soused Mackerel. Prepare four mackerel by cleaning them and splitting them through the middle and removing the backbone. Cut each fillet into three or four pieces. Season with salt and place in a fireproof dish with 12 peppercorns, 2 bay leaves, 1 blade mace, 2 cloves, and 1 teaspoonful salt. Cover with equal quantities of vinegar and water. Cover the dish, bake slowly for 1½ hours and serve cold in the vinegar.

Preserving Mackerel. Mackerel can be preserved in districts where there is a glut of fresh fish in the following way: Clean the fish thoroughly and either fry or boil it. Divide the fish, removing the heads, bones, and skin. Rub over the flesh with the following mixture: For each dozen fish use 3 tablespoonfuls salt, 1½ oz. black pepper, 6 or 8 cloves, a sprinkling of mace and of nutmeg. Cover the whole surface of the fish with the seasoning, and pack the fish in layers in a stone jar. Cover all over with good vinegar, and, if it is wished to keep the fish for some time before being used, pour salad oil or melted suet over the top of the jar. Do not use a glazed jar, as vinegar acts on this in an injurious manner. See Fish, Sauces.

MACKINTOSH. A mackintosh may be washed by first soaking it in cold water, spreading it on a table, and then scrubbing it with household soap. Rinse the mackintosh by dipping it in a tub of cold water, shake, but do not wring it, and let it dry on a coat-hanger either out of doors or near an open window.

Mackintosh aprons, provided with a shiny white rubberized surface, which can be easily kept clean with a damp cloth, are worn by mothers when bathing babies; and it is usual to make up the cot of a small child with a mackintosh sheet immediately under the blanket as a protection to the mattress. See Baby; Rubber.

MACRAMÉ WORK. One of the oldest forms of lace-making is that known as macramé. Macramé twine, a variety of linen thread, is specially made for this work, which is done on a cushion or board. Some workers use a shallow box, measuring about 20 in. long by 10 in. wide. In this must first be placed heavy leaden weights, then a bag made of unbleached calico, and covered with coloured sateen. The bag is stuffed tightly with bran, and fits firmly and tightly into the box, reaching a little above it. Macramé frames may be purchased, but the box makes a good substitute. It is also possible to use a smooth piece of board, about a yard long and 8 to 10 in. wide, and fit it at each end with small, strong screws to hold the thread.

A few glass-headed toilet pins are sometimes used to keep the thread in position, and a large crochet hook to pull the threads under each other. If fine twine is used, all foundation threads should be double. Fasten the first cord lengthways across the board or frame by tying it round the screws or pegs.

To put stitches on, fold together the two ends of a length of twine, pass them up and under the first foundation cord, bring the ends down over it and through the loop thus formed. Draw them down lightly, and fasten as many in this manner as are needed for the length of work; then put another foundation cord just below where the threads are fastened on to the first one. Knot them on to this by taking the first thread in the right hand, passing it over and under the second foundation cord, and through the loop formed. Draw it up tightly, and do this to all before commencing the pattern.

The single-knotted bar, one of the simplest patterns, is worked thus. Having got the threads knotted on the foundation cords, hold the first thread in the left hand straight down, take the second thread in the right hand, and pass it over the first one, under and up through the loop thus made. Then hold the second thread in the right hand, and work the same stitch with the left hand (first thread). Repeat this alternately for the length required, drawing each stitch up tightly as it is made.

Macramé twine in bright colours can also be knitted or crocheted into various articles, such as shopping bags or table mats. See Crochet.

MADAPOLAM. A plain cotton fabric generally sold in the bleached state, madapolam is heavier than cambric and finer than long-cloth, being made from fine-spun and good cotton.

MADEIRA: The Wine. It is said of madeira that it can never be drunk too old. It is a rich and generous wine with nutty aroma, owing its excellence to the climate of the island of Madeira, as well as to the black and white grapes from which it is made. It contains from 16 to 20 per cent of alcohol.

Madiera is served with soup, especially turtle soup, and with fish, and may be drunk instead of port as a dessert or after-dinner wine in hot weather. The best sweet variety is Malvoisie. White Sercial is dry, and a richer sort is Bual Madeira. See Wine.

MADEIRA CAKE. Madeira cake is made from ½ lb. margarine, 10 oz. castor sugar, 1 lb. flour, 6 eggs, a few drops of lemon essence, a thin slice of citron peel, and a pinch of salt. Cream the margarine and sugar; then add the flour and eggs alternately, beating thoroughly after each addition. Mix in the salt and lemon

essence, and beat well for a few minutes, afterwards pouring the mixture into a well-papered and greased tin. Bake in a moderate oven for 1½ to 2 hours and, when half-cooked, place the peel on top.

MADEIRA VINE. An attractive half-hardy climbing plant, the Madeira vine bears fragrant flowers during autumn, and reaches a height of about 8 ft. It is most suitable for greenhouse culture, but will grow on a south wall outdoors during a warm summer. The plants are raised from tubers planted in a temperature of 55° during February.

MADLINE CAKE. Small fancy cakes coated with jam and desiccated coconut are made thus: Sieve together ½ lb. flour and ½ teaspoonful baking powder, and beat 2½ oz. margarine or butter to a cream with



Madeline Cakes, coated with jam and coconut, a popular cake with children.

the weight of 2 eggs in sugar. To the latter mixture add 2 eggs, beating each in separately for about 10 min.; then fold in the flour and add a little milk. Stir the mixture lightly and put it into some greased tin moulds similar in shape to small flower-pots. Bake the cakes in a hot oven for about 12 or 15 min., until they are lightly browned and spongy to the touch, and leave them to cool on a sieve. Heat about 4 tablespoonfuls jam, thinning it down with a little water if necessary, and then rubbing it through a sieve. Brush it over the tops and sides of the cakes, and coat the sides with coconut. The top can be decorated with half a glacé cherry.

MADONNA LILY. One of the oldest and loveliest of lilies (*Lilium candidum*), this has been cultivated in British gardens for more than 300 years. The fragrant white flowers, on stems 3-4 ft. high, open in June. See illus. p. 713.

Madwort. This is another name for the perennial yellow alyssum (q.v.).

Magdyuo. See Magneto.

MAGGOT. The larvae or maggots of various flies do much damage to garden plants and crops, e.g. onion, chrysanthemum, carrot, pea, carnation, marguerite, and cineraria. The best preventive treatment is to spray the plants with an evil-smelling insecticide such as paraffin emulsion for the purpose of keeping away the flies.

MAGIC HUNDRED. This puzzle consists in arranging the numbers from 1 to 100 in ten rows in such a fashion that the total of the numbers counted in any one of three ways, horizontally, vertically, or diagonally, shall be exactly 505.

The principles upon which the solution is based are fairly easy to remember if the rows are numbered. The horizontal rows should be numbered 1 to 5 from both top and bottom. The rows numbered 1 contain the numbers between 1 and 10 and between 91 and 100; the rows numbered 2 contain the numbers between 11 and 20 and between 81 and 90; the rows numbered 3 contain those between 21 and 30 and between 71 and 80; the two

rows 4 contain those between 31 and 39 and between 60 and 70, except 61, which is compensated for by the presence of 41. The rows marked 5 contain the numbers between 42 and 50, and also 40 and 61.

The vertical rows may be lettered A, B, C, D, E from each end. In this case it will be seen that the unit figures in the A's are noughts and ones; in the B's they are twos and nines; in the C's they are threes and eights; in the D's they are fours and sevens; and in the E's they are fives and sixes. To solve the puzzle the figures should be arranged as shown, and when added up in any direction the result will be 505.

	A	B	C	D	E	E	D	C	B	A	
1	91	2	3	97	6	95	94	8	9	100	1
2	20	82	83	17	16	15	14	88	80	81	2
3	21	72	73	71	25	26	27	78	79	30	3
4	00	39	35	64	06	05	67	43	32	41	4
5	50	49	45	57	55	56	54	43	42	51	5
6	61	50	58	47	45	46	44	53	52	40	6
7	31	09	08	34	35	36	37	03	02	70	4
8	80	22	23	24	75	76	77	28	29	71	3
9	90	12	13	87	86	85	84	19	18	11	2
10	1	09	08	4	06	5	7	93	92	10	1

Two simpler puzzles of this class may be given. One is to arrange the numbers 1 to 9 in 3 rows so that the total of each row, added together in any one of the three possible ways, will be 15. The solution is:

2	9	4
7	6	3
1	5	8

A further one is to arrange the numbers 1 to 36 in six rows so that the total of each possible row shall be 111. The solution is:

8	30	27	19	25	11
35	6	33	34	1	2
17	13	22	21	24	14
20	10	16	15	18	23
5	31	4	3	36	32
26	12	0	28	7	29

MAGNETOS FOR MOTOR VEHICLES

Constructional Principles of These Essential Parts of the Car

This article will be found useful by the owner of a motor car or a motor cycle. He should turn to those headings, as well as to Gear, Internal Combustion Engine, Lubrication, etc.

A diagrammatic drawing of a common type of magneto is given in Fig. 1, and shows the complete wiring from the armature to the sparking plugs. The return or earth circuit via the sparking plugs is shown in dotted line. The cycle of operation is as follows: A represents the permanent stationary magnets to which are attached pole pieces, B, that are fitted so as to bring the magnetic field as close as possible to the armature D, thus intensifying the field of force. Rotating between these pole pieces is the armature D, which is constructed of an iron core, composed of a large number of thin plates tightly compressed. This is done in order to avoid waste current being generated in the core itself. On this core are wound the primary and secondary coils.

The first, the primary, consists of a few turns of fairly thick insulated wire, one end of which goes to the fixed platinum point of the contact breaker, E, and is tapped for the condenser, F, and the short circuit or earth switch, G, its other end being earthed. When the earth switch is closed, the current flows through the primary windings across the earth switch back to earth. Therefore, although the contact breaker, E, will still be operating, it will no longer be interrupting, via the platinum points, the flow of the primary circuit, so that no high-tension current will be generated in the secondary winding that goes to the sparking plugs.

The second of these coils, the secondary winding, is composed of a

MAGIC LANTERN. Lantern used for throwing pictures on a screen. There are both standard and toy lanterns, but the principles are the same in both. They are now better known as optical lanterns. See Lantern Slide, Optical Lantern.

MAGIC MUSIC. In this game one person leaves the room, while the others hide a trumple or any other small article. The absent player then returns, and his business is to find the article. He is assisted by someone playing the piano the music being very soft when he is far from the object and becoming louder and louder as he approaches it.

MAGNESIA. The oxide of magnesium. There are two kinds, the light and the heavy. Both act as antacids and laxatives. Fluid magnesia, or the solution of bicarbonate of magnesia, is given in doses of 1 to 2 oz., $\frac{1}{2}$ dram for a child under 12 months old. It is said to be less liable to form concretions in the bowels. Magnesia preparations are sold under the trade name Milk of Magnesia.

MAGNESIUM: In Medicine. The salts of magnesium are used in medicine as an antacid and purgative. Magnesium sulphate, or Epsom salt, is a reliable saline purgative. White mixture is a laxative consisting of magnesium sulphate, 3 drams; magnesium carbonate, 1½ drams; and peppermint water, 6 oz. The dose is $\frac{1}{2}$ to 2 oz.

MAGNESIUM: In Photography. Magnesium, in ribbon or powder form, burns with a strong actinic light, and is sometimes used for indoor and other photographs when day light is not available. Magnesium powder when mixed with potassium chlorate or perchlorate, or other combustible chemicals, is known as flash powder. It should not be made by the amateur, as some formulae give mixtures dangerous to prepare. See Flashlight.

the armature by means of a long screw. The contact breaker carries the fixed platinum point, L, which is in contact with the end of the primary winding, and the movable platinum point, M, through the medium of which the earth or return circuit of the primary winding is closed. This movable platinum point is operated by a bell crank lever, that keeps it in contact with the stationary platinum point, L, by means of a flat steel spring. At the end of the bell crank is inserted a hard fibre block that makes contact with the cams which are on the inside of the cover N, that surround the contact breaker. The action of these cams against the fibre block of the bell crank causes the platinum points to separate, thereby breaking down the primary circuit and causing the secondary current to be induced. Mounted on the back of the contact breaker is a small spring-fed carbon brush that makes contact with the body of the magneto and completes the earth or return circuit of the primary winding via the platinum points. Fig. 2 shows the construction of the contact breaker.

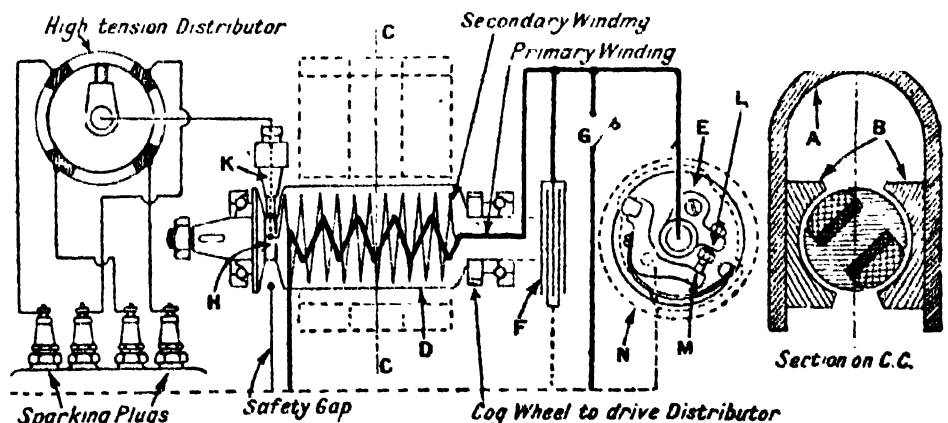
The armature cuts the field of force twice during one complete revolution. Therefore two high-tension currents will be induced, and for this reason two cams are provided on the contact cover cam ring, and are so arranged that the primary circuit is broken at the moment when the armature is approximately at right angles to the field of force, in which position the maximum intensity of induced current is produced in the secondary winding.

The functioning of the condenser is as follows. When the platinum points of the contact breaker separate, the collapse of the primary circuit has the unfortunate effect of inducing a follow on current in the primary winding, but by interposing the condenser in the circuit, as shown in Fig. 1, this current is arrested. Instead of flowing on and arcing the platinum points it takes the easier path into the condenser, and charges up the opposite plates with static electricity, which when fully charged discharges in opposite directions, thereby damping out the follow on current in the primary circuit, and causing the essential immediate collapse of the field of force.

Other Systems. Another type of magneto is employed, in which the primary and secondary windings are stationary, the permanent magnet with its pole pieces being the revolving part. A magneto of this kind is shown at Fig. 3.

In the inductor magneto there are rotating inductors of soft iron, and fixed magnets and windings. The magnetic flux through the core is reversed as the inductors revolve.

The Distributor. In the case of magnetos to be employed for engines of 4 or more cylinders it is customary to include a high-tension distributor as part of the unit. This is usually mounted at the contact breaker end,

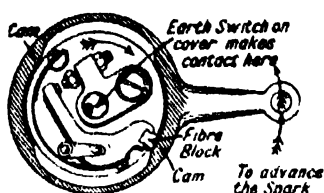


Magneto. Fig. 1. Diagrammatic lay-out of the wiring of the common type high-tension magneto for a four-cylinder engine. An explanation of the lettering will be found in the text.

and driven by a gear wheel that is a part of the armature. As the armature gives two high-tension currents per revolution there will be twice the number of teeth on the distributor gear wheel. For a 4-cylinder engine the armature makes two complete revolutions to fire the charge in all 4 cylinders and as the 4 high-tension leads go to the distributor this will have made one complete revolution during the period.

The distributor usually consists of a fibre ring into which 4 bronze segments are embedded. Rotating in the centre is the high-tension brush driven by engaging a pinion on the gear wheel on the armature. Mounted at the back of the distributor is the spring-tied carbon brush that picks up the high-tension current from the slip ring and passes it to the segments by way of the rotating carbon brush in the correct order of firing. In place of the brush, on some magnetos a small gap is provided at corresponding points.

With magnetos designed for use on single and twin-cylinder V-machines, the high-tension distributor as described, is dispensed with, and the current taken direct from the slip-ring. The only difference is that for the twin-cylinder engine the slip-ring is formed with two insulated segments, so that the spark shall go to the correct cylinder in order of firing. In the case of the magneto intended for use on twin engines, the cylinders of which are set at an angle of about 50°, it may be noted that it is impossible for the spark to take place at the most efficient position of the



Magneto. Fig. 2. Contact breaker showing a cam in action

approximately 0.4 mm. or 0.015 in. ($\frac{1}{16}$ in.). If they are too wide apart, considerable difficulty will be experienced when starting up the engine by hand.

With a new magneto, the small fibre bushed-bearing, in which the steel pivot of the bell crank lever works, may be come tight. It is usually only necessary to clean the pin with metal polish, but if that is insufficient fine emery cloth may be used with care. It is inadvisable to enlarge the bush. The pin should be slightly moistened with thin oil before re-assembly. At the back of the contact breaker will be found the small carbon brush that carries the earth return of the primary circuit. This should be occasionally treated in the same way as described for the slip-ring carbon brush. All carbon brushes will at intervals require the same treatment.

The magneto is a very powerful electrical machine, its power increasing in proportion to the speed of the armature. Perfect cleanliness of all its parts is absolutely essential if it is to remain in good order for long periods. Care should be taken to see that the wiring is in good order and not slack at the terminals. This applies in particular to the switch terminal on the contact breaker cover. It is not an uncommon occurrence for one of the fine strands of wire that go to form the complete cable to come adrift and make contact with the metal of the cover, thereby shorting the primary circuit. In all cases of a failure of the high-tension circuit, it is as well to examine very carefully the wiring,

as well as the switch itself, before looking to the more complicated details of the system.

When replacing the contact breaker, see that the small key that locates this part with the armature is entered into the slot provided to receive it. Also, when oiling at the parts marked be careful not to overdo it, as oil may get on to the armature and damage the insulation.

The Magdyno. On motor cycles a machine is sometimes used which combines in one unit a magneto to energize the sparking plugs and a

dynamo to charge a small accumulator for lighting. The current output is usually 6 volts, at 5 amps. Since, owing to limitations of space and weight, the accumulator is small in capacity, the dynamo is kept on charge when lights are in use. There is a single drive from the engine, the dynamo being geared up from the magneto spindle. Fig. 4 shows a Lucas motor-cycle magdyno.

MAGNOLIA. The magnolia is a group of evergreen and leaf-losing shrubs or small trees of great beauty. Most of them are suitable for general planting out of doors; others need the shelter of a wall. They thrive best in loamy soil with which peat or leaf mould has been mixed. Small trees should be planted in early autumn, as large ones are difficult to transplant successfully. They need no pruning except that which is necessary to keep the trees shapely and well balanced.

Magnolia stellata forms a bush 4 ft. or more high and bears small white flowers in March-April. Other kinds form trees 15 to 30 ft. high and bear large cup-shaped flowers. A few of the best are conspicuous (the Yulan), white, April, obovate and soulangeana, reddish, April, and parviflora, white, May. All these lose their leaves in winter. *Magnolia grandiflora* is a vigorous evergreen with large



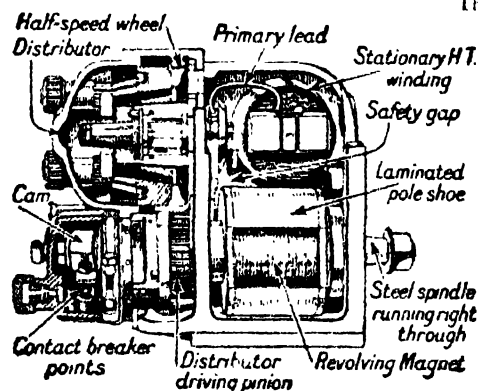
Magnolia. Large fragrant cream-white flowers of *M. grandiflora*. Above, left, the white star magnolia (*stellata*), which blooms in March-April.

handsome leaves and in summer bears immense cream-white fragrant flowers; it must be planted against a sunny wall.

MAGPIE. Magpies are occasionally kept as pets. They need large cages and can be easily taught, so that they will go freely about the house, but they are very prone to theft. They can be fed on scraps from the table, bits of meat, raw or cooked, and ground oats. In the wild state magpies are of some assistance to the gardener, as they feed on worms, insects and snails. See Bird Cage.

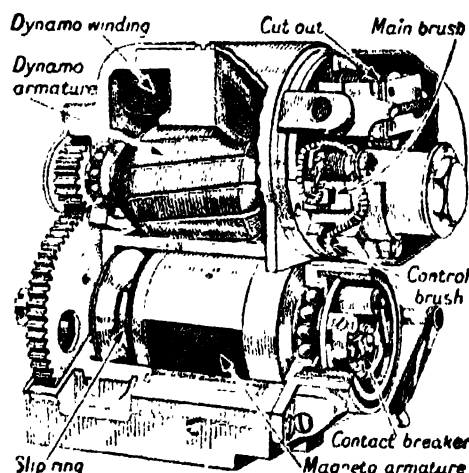
MAGPIE MOTH. The caterpillars of this common moth, which is white with black and yellow spots, often do serious damage to gooseberry and currant bushes in early summer. Many of the caterpillars, which are marked with black and yellow, can be destroyed by shaking the bushes vigorously to cause the pests to fall to the ground and then scattering lime on them. Hand picking is also advised before the caterpillars become numerous.

Poisonous washes, e.g. arsenate of lead, will destroy them, but they must not be used



armature, i.e. when it is at right angles to the field of force. The reason for this is that 50° cannot be equally divided into 360°.

Care of Parts. Magneto construction of the present day is so extremely specialized that it is seldom that any derangement occurs. There are two parts that should receive periodical attention, namely, the slip-ring and the contact breaker. The slip-ring should be occasionally cleaned with a little petrol and a rag, placed over the end of a piece of wood, and held in contact



Magneto. Fig. 3 (above). M.L. magneto with rotating magnet and fixed primary and secondary windings. Fig. 4 (below). Lucas motor cycle magdyno, with small dynamo and magneto combined to form a unit in which each functions independently. The dynamo is geared up from the magneto spindle.

within 3 or 4 weeks of gathering the fruits, which must be thoroughly washed. Great benefit often follows the use of caustic soda, 2 oz. per gallon of water, in winter when the bushes are leafless, for the small caterpillars hibernate in crevices on the gooseberry and currant trees.



Magpie Moth. Garden pest which attacks currant and gooseberry bushes.

MAH JONGG. Ancient Chinese game for four players, popularised in England about 1924. It is played with 136 pieces (tiles), four of each of the following denominations: east, west, north, and south winds; green, red, and white dragons; numbers 1 to 9 each of three suits, generally called in England bamboos, characters, and circles. There are eight supernumerary tiles called flowers and seasons, but these affect only the scoring, not the method of play. The players are named after the four winds, dealer on each round being E. and banker. The 136 tiles are arranged face downwards in the shape of a wall with four sides of 34 tiles each. The point of opening is determined by dice, and each player is dealt a hand of 13.

The object is to collect a hand consisting of four groups of three tiles each, either all of the same denomination (pung) or a suit sequence (chow), and a single pair. Such a hand will win a player to declare Mah Jongg and win the round. Method of collection is by drawing and discarding, according to somewhat elaborate rules and conventions. The drawing is done either from the wall or from the discards of other players. As a winning hand contains 14 tiles, the draw must always precede the discard. Three of a kind can be converted into four (kong), which quadruples the value, but an extra tile must be drawn immediately so that the required combinations can still be formed; a sequence is limited to three. The winner is paid by each opponent to the full value of his hand; the rest pay or receive their differences, E. always paying or receiving double. Scoring is complicated.

MAHOGANY. Besides its rich brown red colour, and the figuring of its grain, mahogany has qualities which make it a good furniture wood. It does not shrink or warp much, has very few knots, seldom becomes worm-eaten, is obtainable in wide pieces, its colour darkens and improves with age, and it can be given a high polish.

It is used for interior fittings of houses and public buildings as well as for furniture. Handrails for staircases are sometimes made of it, and counter tops and other shop and office fittings, and interior fittings of vehicles.

The best kind, known as Spanish, comes from the W. Indies, chiefly Cuba. It has a richer colour and better figuring than Honduras mahogany, and is often used as veneer.

MAIDENHAIR FERN. The common maidenhair fern (*Adiantum cuneatum*) makes an excellent pot-plant for indoors during the summer months. It should be kept from direct sunlight, out of draughts, and the soil should not be allowed to become dry or at any time sodden. Frost, or prolonged low temperature, will kill it. If it is to be repotted, this should be done when new growth starts in spring, the compost consisting of two-thirds loam, one-third peat or leafmould, and some sharp sand. A specially vigorous species for the heated greenhouse is *Adiantum farleyense*.

MAIDEN PINK. This pretty low-growing pink (*Dianthus deltoides*) flourishes in sandy soil in a sunny rockery. The flowers are of carmine-rose shade; those of the variety *granitosus* are more richly coloured. This

pink is easily raised from seed sown in a box of light soil out of doors, or in a frame, in May. The seedlings will flower in the following and succeeding years and should be planted permanently in autumn.

MAID OF HONOUR.

A simple form of the Richmond cheese cake known as maid of honour is made thus: Curdle $1\frac{1}{2}$ pt. fresh milk by adding rennet powder as for a junket. A pinch of salt helps to separate curd from whey. Strain the curdled milk through a piece of fine muslin and drain the curds before rubbing them, with $\frac{1}{2}$ lb. butter or margarine, through a sieve. When this is done add the yolks of 2 eggs, beaten lightly to a froth, and also about a dessertspoonful of brandy.

Blanch and chop finely $\frac{1}{2}$ oz. sweet almonds and 3 or 4 bitter ones, and add them with a little sugar and a sprinkling of powdered cinnamon or nutmeg. Lastly add the juice and grated rind of half a lemon. Line some patty-pans with puff pastry, fill them with the mixture, and, if desired, sprinkle with a few currants before baking them in a good hot oven. See Cheese Cake; Pastry.

MAINSRING. The driving spring in the mechanism of a timepiece is the mainspring, which performs the same function in any other spring-driven motor, such as that for a gramophone. It is generally in the form of a thin, flat steel grip, hardened and tempered to give it resiliency, and is coiled up by means of the winding arbor into a close, tight spiral. It exerts its power in uncoiling, thus imparting motion to the main wheel. The spring when purchased is coiled up, and is surrounded by a metal band, which prevents it uncoiling until it is removed. This should not be done until the inner end of the spring has been attached to the winding spindle and the outer end to the cage, or part to be driven. Should the retaining ring or pin be removed before the spring is under proper control, it will fly out and probably do damage. The coils of the spring should be thoroughly lubricated. See Clock; Gramophone; Watch.

MAINTENANCE: In Law. When a married woman is obliged to apply, apart from her husband, for parish relief, the authorities may summon the husband before the justices, and the magistrates may make an order upon him to pay such sum weekly or otherwise towards the cost of the relief of his wife as shall be deemed to be proper. They may order that this money be paid to the guardians or to the wife or any other person for the wife's benefit. This should be carefully dis-

tinguished from alimony or from the kind of order made under a separation order when the magistrates decide that a husband and wife need not live with each other.

In the divorce court, if a decree has been made at the instance of the wife for dissolution of the marriage, the court has the power to make an order upon the husband for the permanent maintenance of his wife. This may take the form of an order that he shall hand over some of his property to trustees, who are to apply the income for the wife's maintenance during the remainder of her life, or it may have the form of an order that he shall pay so much a year to the lady. The court has no power to order the husband to pay a lump sum.

The provision ordered is usually a sufficient maintenance according to the rank and means of the parties. This does not mean a bare maintenance. The rule usually followed is that the husband shall allow such a sum as will make up his wife's income to one-third of the joint incomes of the parties. Thus, if the husband has £1,000 a year and the wife £200, the joint income being £1,200, the wife would be entitled to £400, i.e. £200 from the husband in addition to her own £200.

Although this is the ordinary practice, it is not invariable. Where it is possible the court will order security to be given for the payment so that the husband cannot subsequently put his money out of her reach and so deprive her of what is her due.

At one time the view was taken that such orders for maintenance should be conditional on the wife remaining single and chaste; but nowadays the court will not make any such order except in special cases, so that the allowance will be continued although the wife marries again or leads an immoral life. Sometimes under special circumstances, when the wife is the guilty party and is divorced by the husband, the court will, as a condition of granting the divorce, order the husband to make provision for his wife; and in such cases a clause will generally be ordered to be inserted that the money shall only be paid so long as she remains single and chaste. See Alimony; Divorce; Husband; Separation Order; Wife.

Maisonette. Literally a small house, this word is often used as a synonym for a flat. See Flat.

MAÎTRE D'HÔTEL. This name is given to a method of preparing sauces and other dishes by heating them up with parsley and butter flavoured with lemon juice and seasoning. Maître d'hôtel sauce is a white sauce, made with stock instead of milk, containing chopped parsley and lemon juice. Vegetables re-heated in butter and clear soup or stock to cover, and then flavoured with chopped parsley and lemon juice, are given the name of maître d'hôtel. Chives or finely chopped spring onions are often added as a garnish. Haricot or butter beans or a mixture of green peas and carrots cut into small cubes are excellent re-heated in this way.

MAIZE. This is an alternative name for the genus of fine-leaved grasses known as Indian corn. It is made into meal, which can be cooked in various ways.

Maize Meal. This meal is made from the ripe grains of maize or Indian corn, finely ground. It is useful for thickening soups, in



Maidenhair Fern. The delicate fronds of this beautiful fern are much used for mixing with cut flowers for buttonholes and vases.

the place of flour, and for making porridge, bread, cakes, puddings, etc. As it does not keep very well, it is advisable not to buy more than will be used at once. It will soon go bad if kept in a damp place.

Maize porridge is made by sprinkling the meal into boiling water or milk, flavoured with a little salt, and stirring it for about 10 min., until it thickens. Then add a small piece of butter and serve it hot with milk and sugar, jam or golden syrup.

Maize meal can be used for bread making, using half white flour and half maize meal. Caraway seeds are usually added.

Buns are made from 4 oz. maize flour, 1 tablespoonful golden syrup, $\frac{1}{2}$ teaspoonful baking-powder, 1 oz. dripping or margarine. Mix the dry ingredients and rub in the fat. Make a hole in the centre of the flour and add the syrup. Mix it to a stiff paste with a little milk and put it into a greased tin. Add a few raisins or currants, if desired, and bake 15 mins. in a hot oven.

The ingredients for a pudding consist of 4 oz. maize flour, 2 oz. flour, 2 oz. suet, 1 egg, 1 oz. sugar, 2 oz. dates. Mix the flours, shred and chop the suet, stone and cut up the dates. Add these to the flours with the sugar and a pinch of salt. Beat the egg and mix this in. Use a little milk in addition, if necessary, to make the mixture into a soft paste, and put it into a greased basin and steam it for $1\frac{1}{2}$ hours.

Two favourite American dishes made from maize meal are Johnny cake and jolly boys. A very good Johnny cake can be made from the following recipe: Mix together 1 teaspoonful maize meal and 1 teaspoonful flour with 3 oz. sugar and a teaspoonful baking powder, also a good pinch of salt. Beat an egg with 1 gill milk, melt 1 oz. margarine and stir it to the egg and milk. Pour the liquid on to the meal and beat as for batter. Turn it into a shallow tin and bake it from 30-40 min.

To make jolly boys, first scald $\frac{1}{2}$ pint meal. Cream $\frac{1}{2}$ lb. margarine with 6 oz. castor sugar; add 2 well-beaten eggs, then $\frac{1}{2}$ pint milk which has been scalded and cooled. Cream $\frac{1}{2}$ oz. yeast; mix the liquid to it by degrees and then make up into a dough, cover it over, let it rise till light and make it up into balls as for doughnuts, but rather smaller. Fry these in deep fat and roll them in sugar while hot. See Indian Corn; Popcorn.

MAJOLICA: The Ware. Some excellent reproductions of the majolica faience of medieval Italy, as well as original designs conceived in the same spirit, have been made at the Minton works since the middle of the last century, and similar wares were introduced by Wedgwood. They are produced by different methods, the former being made of dark clays with an opaque enamel, while the latter consist of white bodies with transparent coloured glazes.

There is a large output of reproductions of the early ware in Italy, including round and oval dishes, trenchers and shallow bowls, drug jars and ewers.

Genuine old majolica, the noblest production of European

ceramics, comprises the output of several famous Italian fabriques, notably in Urbino and its vicinity, which were at their greatest during the 15th and 16th centuries. The most characteristic ware was tin enamelled on dark clays, covered with painted designs, and lusted with metallo sheens. Some of the finest

examples were wrought in the silver-lustre at Deruta and the ruby-lustre at Gubbio. This style of pottery decoration was derived from the lusted faience of Moorish Spain, which in its turn was based upon the great lustre ware of Syria and Persia. In the Italian ware the designs were usually biblical or historical scenes.

MAKE-UP FOR AMATEUR ACTORS

Methods and Processes Explained and Illustrated

Those readers who are interested in amateur acting should consult also the articles on Stage and Amateur Theatricals. See also Fancy Dress and Tableaux Vivants.

Amateur actors, to be successful, require a knowledge of make-up. Perhaps the most important matters that must be taken into account are the size of the hall or theatre and the brilliance of the stage lighting. If the performance is to be given in a theatre with footlights, lengths, sidelights, batons, topights, and limelight, all natural shadows are flattened out, and it is essential in order that the expression should carry for the features of the players to be emphasized.

For this type of make-up grease-paints are the best medium to employ. They can be purchased in numbered sticks, with other requisites for make-up, at any theatrical costumier's and most large chemists' stores. The face should first be cleansed with cold

cream, which is wiped off, and then the foundation paint of the desired colour is applied and evenly worked in with the finger-

as shown in Fig. 1, using only a little colour in dab until the desired effect is reached. The shape of the lips should be improved with the lip-stick, emphasizing the bow of the upper lip if necessary, and the eyebrows carefully pencilled with a brown or black liner. Shading the eyes effectively requires a little practice. A dark blue line may be applied along the lashes, and this line should be carefully blurred to shade the lid. With a little more dark blue paint on the tip of the third finger shade under the eyebrow to the eyelid, bringing the colour just beyond the outer corner of the eye, and blending it imperceptibly with the foundation. Care is necessary or a hollow-eyed appearance results. A line drawn for about $\frac{1}{2}$ in. with blue or black liner beyond the outer corner of the eye gives width. The edge of the lower lid should also be delicately shaded by using the paint on the finger-tip.

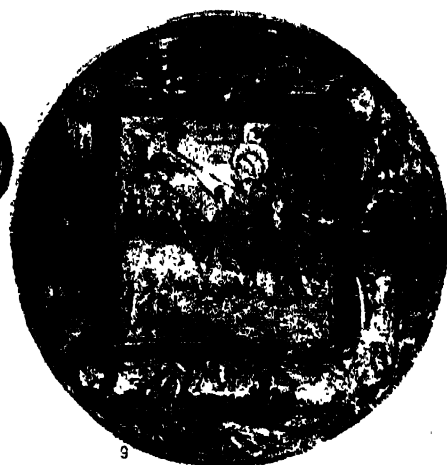
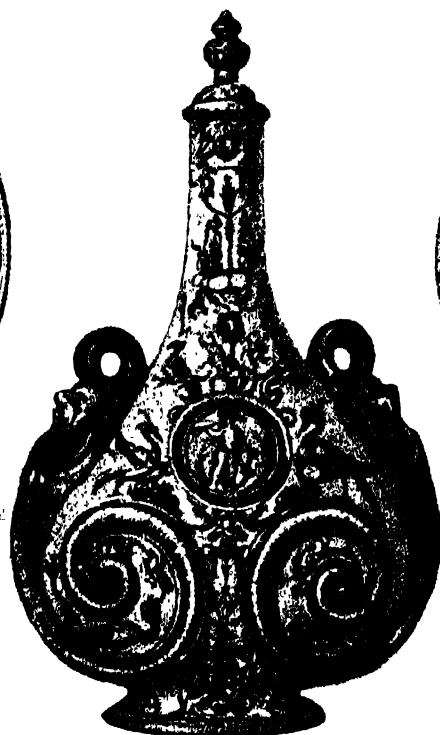
A pink powder for fair or yellow powder for dark complexions should be applied thickly. If the cheeks appear too pale, a touch of dry rouge can be added after powdering. The eyebrows should be gently brushed free of powder



Make-up for Women. Fig. 1. Applying cream on a foundation of grease-paint. Fig. 2. Melting black grease for lashes. Fig. 3. Applying the eyelids black with a fine camel-hair brush. Fig. 4. When fully made-up the wig is drawn carefully on from the back of the head. Fig. 5. Complete make-up for powder period costume with patches.

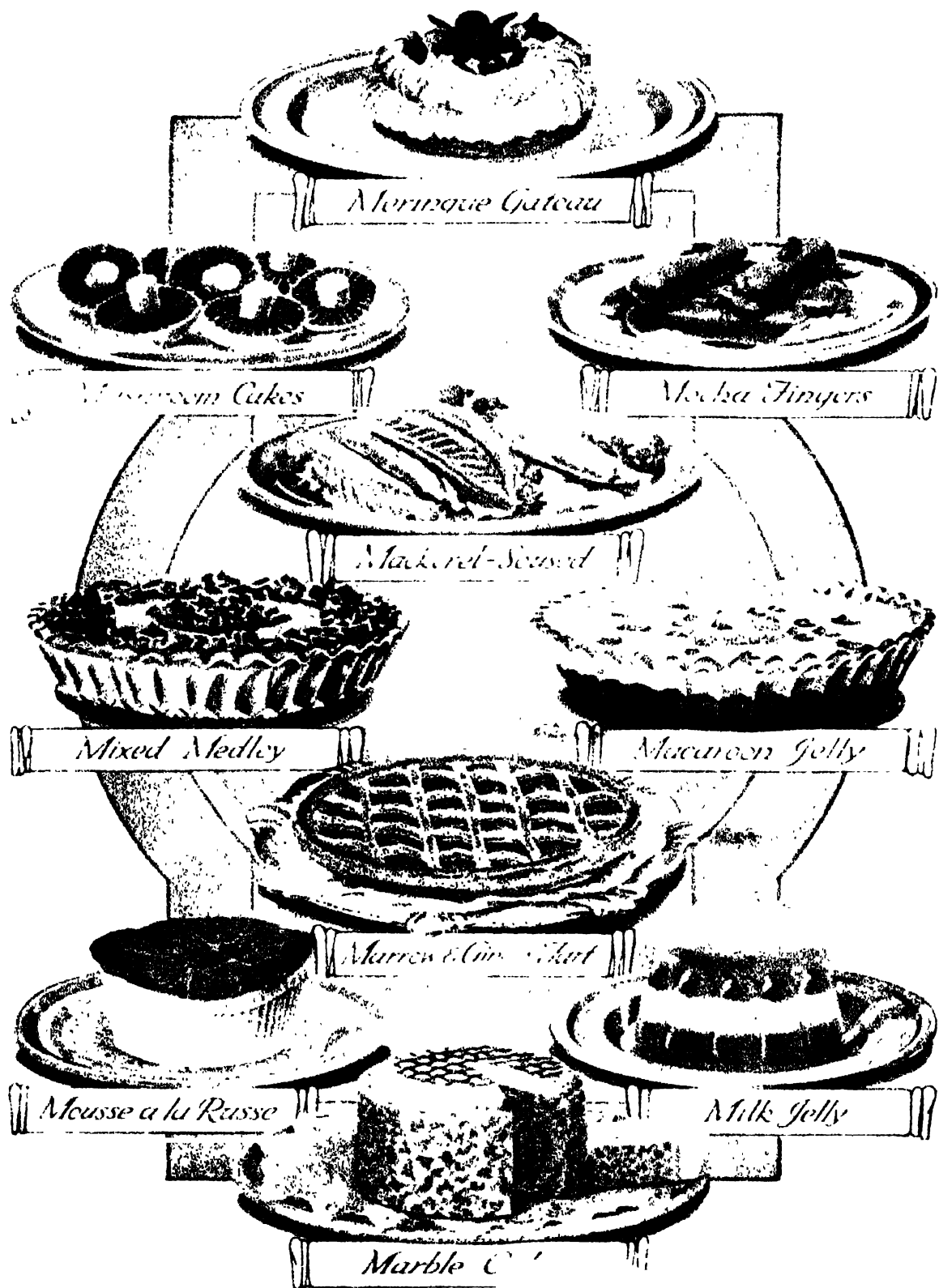


Majolica Ware. Pharmacy vase with portrait figures. Faenza c. 1640



MATH 10100: LINEAR ALGEBRA FOR THE COLLECTOR

[illegible]



* M = 100, $\beta = 10$ (1) SITUATION SHOWN IN FULL COLOUR

[illegible]

lashes must be treated with black grease cosmetic. A small quantity is rubbed over a candle in a metal spoon (Fig. 2) and with a fine camel-hair brush the liquid black is applied to the lashes, as shown in Fig. 3. For neck, arms and hands a theatrical wet-white may be applied with a sponge, rubbed in smoothly with the hand and afterwards powdered with white powder.

The effect of fragile age may be got by use of 1½, with 5½ predominating for the foundation, a little rose-pink grease-paint worked into the cheek-bones, pale colour on the lips, light blue liner blended with a touch of lake blue to obtain a delicate purple for the eyebrows.

Any faint indications of natural features must be followed, and a high light must be put above and below a line with the 1½, also shaded with the finger-tip. The cheeks should be shadowed with the blue and lake below the cheek-bone and also the hollow emphasized in the inner corner of the eye below the brow and under the eye, very little colour being used to avoid a patched appearance. The lashes should not be made up with grease cosmetic after powdering, but just brushed with water-black.

White or grey wigs for period costumes require a fair make-up such as the first one given, and the same applies to a blonde or red wig. Hair should be tightly smoothed, or plaited round the head if long and the wig drawn on from the back after the make-up is completed (Figs. 4, 5). For gipsy make-up, 5 with a little 9 (red-brown) worked into it for foundation and 9 with carmine 3 for the cheeks should be used. Bole, a red-brown powder, can be applied to neck and arms for dark or sunburnt effect.

Methods for Men. For a youthful make-up for men 5 and 3 (dark flesh pink) should be used for foundation, with a touch of carmine 3 for colour, a rather older effect is gained by the use of 5½ and 3 with 9 for colour. The shading round the eyes should be blended with dark blue and lake liners and the eye-brows touched up with brown or black. The lashes should be made up with water-black and not grease cosmetic, unless a very romantic costume is to be worn. Lines and shadows should be added for character make-ups. Fig. 6. Whiskers, moustache and beard can be bought ready-made at a wig-maker's. They should be adjusted to the face with spirit gum (Figs. 7, 8), and a hard effect of join is removed if crape hair of the same colour be used. A little of this should be pulled out and held near warmth to take out the crimp, and then put on with spirit gum to hide the edges. For a gipsy, Mexican, etc., make-up, 5½, 6 (greyish brown), 8 (brown) should be used, with a touch of 9 for colour, and bole for neck and hands.

Men for make-up with period white wigs should use 2½ with a little 5 for foundation,

carmine 2 for colour and a light shade of powder. The adjustment of a man's wig requires care, as the forehead piece must not show the join on the wearer's forehead.

A wig is put on after grease-paint has been applied to the face, but before powdering. The top of the forehead, which will be covered by the wig-band, should have any grease removed from it; and the wig, held by the side-springs, as seen in Fig. 9, is placed on the head with the edge in the correct place on the forehead. Placing one hand on the forehead piece to keep it steady, the back of the wig is gently drawn into position. Then the forehead band is carefully smoothed and made up to match the face, a thicker layer of paint being put along the join (Fig. 10), and worked smoothly into the forehead.

For small halls, drawing-room entertainments, open-air plays or concert work without footlights, a lighter make-up can be used. Women can either apply a day cream with a grease rouge and powder to suit their colouring or use a liquid powder with dry rouge. A slight shading of dark blue round the eyes enlarges them. The brows may be pencilled if necessary. Water-black cosmetic is usually sufficient for lashes, or the melted grease cosmetic may be used sparingly. Most men require little make-up for this class of entertainment unless the brows and lashes need emphasis with a touch of water-black, and a little bole may be used for colour. Lines may be carefully drawn with a paint-brush and water colour.

For amateur filming the necessary make-up is a level tint all over the face. Special foundation paints are used or 2 and 5 or 5½ grease-paint for women and 5 and 6 for men. Blue must not be used for shadings round eyes, as it photographs light; brown or black should be used slightly, and eyelashes may be touched up with water-black. Brown should be used instead of red on lips, as red photographs black.



Make-up for Men. Fig. 5. Character make-up; putting in the finishing touches to the wrinkles before powdering. Figs. 7 and 8. Moustache and beard fixed to the face with spirit gum. Fig. 9. Wig adjusted correctly on forehead and pulled on from sides. Fig. 10. Join of wig air being hidden by grease-paint

Successful theatrical make-up depends not on the amount of grease and paint put on the face and hands but in the skill with which colour and line are applied to the skin. The make-up should not be so heavy that the performer feels he or she is wearing a mask, and there should be complete freedom for facial movement and expression.

If a player's features are not suited to the character part for which he is cast, very little make-up is necessary, and this should be confined to the application of a foundation colour and a few touches here and there to emphasise the deficiencies of the features. If the natural features are of such adapting to the part, carefully applied make-up will give the required illusion.

Skillfully applied make-up helps to emphasise characteristics. Thus a man of make-up may be made to appear much fairer in contrast with dark hair, and the blonde female type can be made to appear even more blonde by a dark facial make-up.

MALACCA CANE. Although walking-out canes or sticks are not so popular as formerly, a malacca cane is sometimes seen. It has distinctive appearance, strength, and durability. The cane or rattan from which it is cut is imported in bundles from the F. Indies. See Walking Stick.

MALACHITE. A rich green stone in appearance very like marble, malachite usually has peculiar lines of light and dark shades of green. The stone is found mostly in Siberian and Australian copper mines. In Near Eastern countries it is frequently used for decorating furniture. It is laid into tables or employed for ornaments.

It is also used for making into cigarette boxes snuff boxes etc., with silver-gilt and gold mounts. Large blocks of the stone are sometimes found which command high prices when cut into vases or other ornaments. Malachite green is an aniline dye used for silk, wool, jute and leather.

MALAGA. One of the wines of Spain is malaga. It comes from the province of E. Andalusia, and is shipped from the port of Malaga. It is a blend of new and old liquor and is one of the best sweet wines which Spain produces. See Wine.

MALAISE. As used by doctors, this word refers to the condition of languor and feverishness common in severe colds, influenza, etc. It is one of the premonitory signs

of nearly all serious illnesses.

MALARIA: Its Treatment. The direct cause of malaria or malarial fever is the bite of the anopheles mosquito, by which minute animal parasites enter the red corpuscles of the blood.

There are three stages in malaria, known as the cold, the hot and the sweating stage. At the early stage diagnosis is often difficult and the condition is liable to be confused with pyæmia, typhoid, and other diseases. During the cold stage the patient is put to bed and kept thoroughly warm. In the hot stage the body should be sponged with tepid or cold water, an ice-bag is applied to the head and warm drinks given. In the sweating stage the patient must be guarded against draughts and chills.

Quinine may be given at any stage. It is best to begin with a dose of 10 to 15 gr. and follow this with 5 gr. thrice daily, but larger

doses are sometimes required. For children equinine, which is tasteless, can be given.

Swamps, marshy ground and stagnant pools favour the breeding of mosquitoes, and for the prevention of malaria such spots should be drained. The larvae may be destroyed by pouring paraffin oil on the water, using 1 pint to 200 sq. ft. The larvae should be destroyed in collections of water round a dwelling-house and all tubs and water barrels should be emptied every week. Open windows may be protected with mosquito net or fine wire netting, and beds surrounded with mosquito curtains. Rooms can be cleared of mosquitoes by burning pyrethrum powder therein.

Some protection from bites is obtained by rubbing the skin with oil of peppermint, eucalyptus, lavender, rosemary, pennyroyal, or a lotion composed of 1 oz. of magnesium sulphate in 10 oz. of water. Quinine taken daily may be a powerful prophylactic, the protective dose, in the case of adults, being 5 to 10 gr. daily.

MALCOLMIA. This is the botanical name of Virginian stock, a hardy annual which blooms in about six weeks from seed sowing. See Virginian Stock.



Male Fern, effective in a shady border

MALE FERN. This is a vigorous native fern (*Nephrodium* (*Lastrea*) *filix-mas*). Of it many beautiful named varieties have been raised, for instance, *oristata*, *furcata*, *grandiceps* and *crispata*, all of which have fronds of most graceful appearance. They will grow in any shady corner if planted in a prepared border of ordinary soil with which leaf-mould and thoroughly decayed manure have been mixed. They should be kept moist in dry weather. Autumn is the best time in which to plant the fern.

MALINES FOWL. Good alike for table and egg production, the Malines fowl possesses a long, deep, broad body and a well-developed breast, and when the cockerels are fattened they carry a wealth of white meat of very fine quality.

The Malines is bred in five colours: black, white, blue, cuckoo, and ermine. The black is solid and deep in colour, but does not carry quite so much green sheen as some other black fowls. The white is pure snowy white. The blue is somewhat like the slaty blue of the Andalusian, it is somewhat rare, and by some is much admired. The cuckoo is the most generally bred colour, and looks the most business-like member of the family. Its ground colour is blue-grey, the feathers being crossed by bars of a metallic blue-black shade, when exposed to the sun the colour takes on a brown-grey appearance due to sunburn.

The chicks when newly hatched are grey on the top and creamy on the under parts. The most beautiful of all the Malines is the ermine, which is marked like light Sussex fowls, the body colour being a pure snowy white with black in the tail, wings and

hackles. The male bird weighs from 9 lb. to 10 lb., and the females from 7 lb. to 8 lb. The hens are good sitters, and the chicks are hardy and mature quickly. It is a very useful and economical breed of fowl. See Chicken; Poultry.

MALINGERING. A hypochondriacal person may believe with too great readiness that he is suffering from some serious disease, and a craving for sympathy may be responsible for hysterical manifestations; but these conditions are quite different from malingering, which means feigning disease to secure some personal advantage, whether the avoidance of duty, the securing of a holiday, or the receipt of money as compensation for sickness. In most cases the application of appropriate tests provides evidence of malingering which is sufficiently convincing, at any rate for a medical man.

MALLET: Some Varieties. A mallet is a small hammer made of wood, such as is used for driving wooden pegs into the ground and similar purposes. The word is also used for the implement with which players strike the ball in croquet (q.v.).

The carpenter's mallet should be slightly rounded on all faces, and not square or flat, as in the case of a joiner's mallet. The handle should be about 13 in. long, and reduced in size at the neck. The head is generally grasped about two-thirds of its length from the head, and, roughly speaking, the angle of the striking faces should be such that if two battens were placed on the two striking faces of the mallet they would cross at some position near the elbow.

The tinman's mallet has a boxwood head about 2½ in. in diameter, and is used for



Malines fowl. Prize-winning white pullet of this useful breed

knocking tin-plate into any required shape. A raw hide mallet has a head made of pieces of hide, coiled round to a diameter of about 2 in. and about 4 in. in length. A hole is drilled in the raw hide, and a wooden handle inserted and pegged into place. The ends of the hide may be fastened, and in some cases are strengthened by a piece of metal. The mallet is used for sheet metal work. The carver's mallet is circular in section and somewhat conical in shape, as in Fig. 1. It is finished in this way so that the carving tools can readily be struck a blow in any desired direction and the striking face of the mallet will be at right angles to the centre line of the tool. If this were not the case the directional control of the carving tool would be difficult.

A metal-bound mallet comprises an iron head, into which two tapered blocks of wood or hide are fitted. A bossing mallet has a pear-shaped head and plain handle. The stretching mallet is very similar in general appearance, both are plumber's tools used in the shaping of sheet and tube lead. The mason's mallet is very similar to the carver's, but larger and heavier and a little shorter in the handle. A large circular, cast-iron mallet, known as a stob mallet, is sometimes handy for rough work.

The method of using a carpenter's mallet is illustrated in Fig. 2, showing how the tool is held. The worker should strive to strike a fair and square blow. When driving two pieces of work together, give the whole face of the mallet a share in the work, as if the blow is struck with only one corner of the head this is likely to be split, and the work is liable to be very badly bruised. See Amateur Carpentry; Mortise.

MALLOW. The name is applied indiscriminately to many plants and shrubs, for instance, Jew's mallow (*Kerria*), rose mallow (*lavatera*), and marsh mallow (*Malva*). See *Lavatera*, *Malope*, *Malva*, *Marsh Mallow*.

MALMAISON CARNATION. This type of carnation, which bears unusually large and handsome blooms in early summer is now very little grown. It has been ousted by the perpetual carnation, which has a much longer flowering period. Those who wish to grow malmaisons prefer the new perpetual flowering type, which needs the same treatment as the perpetual carnation (q.v.). Some of the best varieties are *Boadicea*, deep rose, *Hon. Charlotte*, *Knollys*, red; *Jessie Allwood*, yellow, and *Mrs. C. F. Raphael*, red.

MALMSEY. This strong, sweet liqueur wine is called by the Italians "manna to the mouth and balsam to the brain." It is made from grapes grown on the islands of the Aegean and the Levant. See Wine.

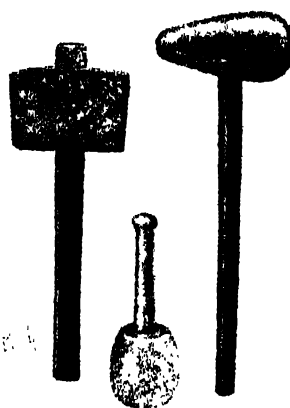
MALOPE. Of this flower the only kind grown in gardens is *Malope trifida*, a showy, hardly annual, 2 ft. high, which bears large crimson flowers in summer. Seeds are sown out of doors in April where the plants are to bloom; the seedlings must be well thinned out to give them room for development, they ought to be 9 or 10 in. apart.

MALT. By moistening barley and allowing it to germinate malt is obtained. In this process a ferment (diastase) in the grain converts some of the starch into malt-sugar and dextrin. The grain is then dried in a kiln and the germinating process stopped.

Malt is used in brewing and distilling, and in medicine. Powdered malt is mixed with



Fig. 1. From left to right, carpenter's, carver's, and plumber's mallets. Fig. 2. Carpenter's mallet in use, showing how it should strike the end of the chisel. Note angle at which tools are held.



wheaton flour to form infant foods. On the addition of hot water, or hot milk and water, the diastase acts on the starch in the flour and converts it into maltose.

In making certain kinds of bread malt is employed, extract of malt being added in the proportion of 1 oz. to 3½ lb. of wholemeal flour.

Malt Extract. Liquid extracts of malt are prepared by making an infusion of malted barley and evaporating it in a low temperature until a syrupy fluid is obtained. This contains a large amount of sugar, often more than half its own weight, and is a valuable and readily digestible food.

Ground malt or malt extract mixed with wheat flour makes malted bread, the starch of which is partly changed into sugar. Dried as well as liquid malt extracts are obtainable. Mixed with arrowroot, gruel, porridge, and any kind of starchy food, they pre-digest it to some extent. They are therefore valuable in convalescence, dyspepsia, neurasthenia, tuberculosis, and whenever the digestion needs help. It must not be forgotten that their digestive action is destroyed when added to food at a high temperature. Malt extract, either alone or combined with cod liver oil, often has a valuable tonic effect in wasting diseases. The dose of the liquid extract of malt is 1 to 4 drams.

MALTESE DOG. The snowy little Maltese dog is animated, intelligent, very affectionate and good-tempered, cleanly in habit, and an expert in engaging little tricks. His



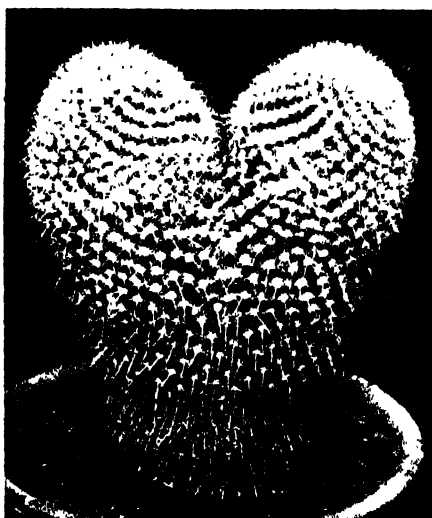
Maltese Dog. A champion of this pure white, silky-coated breed of pet dog

constitution is delicate, and great care is needed in guarding him from chills. His pure white coat requires constant washing, and the long silky hairs of which it is composed quickly get matted unless the comb is used frequently. Drying after washing must be thoroughly carried out.

Much care is needed in the matter of diet, an excess of animal food producing eruptions, a deficiency causing eczema. His head is much like that of the Skye terrier. The short legs are straight and well feathered, and the feet round with black pads. The longer the coat the better, and the only markings are slight patches of lemon tint. The weight varies from 4 lb. to 10 lb., but the less it is the more valuable is the dog. The Maltese is not a terrier, as commonly believed.

MALVA. The botanical name of mallow, a hardy flowering plant represented in gardens by the marsh mallow (*syvestris*) and the musk mallow (*moschata*). They will thrive in poor soil and are perhaps better suited to the wild garden than the flower border. The most valuable is the musk mallow, 2½ ft., which bears rose-coloured flowers in summer; the white variety, *alba*, is very attractive.

MAMMILLARIA. This is a cactus of quaint, even bizarre, appearance which is easily managed if provided with the conditions suited to the cultivation of these plants—namely a sunny, airy greenhouse and a well-

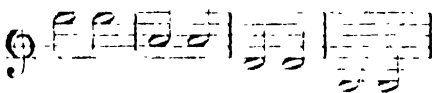


Mammillaria. Small greenhouse cactus, showing the great number of spines

drained compost of loam, sand and powdered brick. They need little water and a minimum temperature of about 45° in winter. Several species are in cultivation, a few of the best are: *barbata*, rose coloured flowers, bicolor, purple, and *dasyacantha*, red; all are but a few inches high. *Missonianus*, yellow, is the hardest and in mild districts is sometimes grown on a well-drained sunny rockery.

MANCHESTER TERRIER. Owing to its great popularity in Lancashire, the black and tan terrier (q.v.) is often referred to as the Manchester terrier. See Dog.

MANDOLINE: How to Play. There is more than one variety of mandoline, but the Neapolitan is most in favour and is here described. The mandoline consists of three main parts: a deeply convex body, having on the upper side a flat belly or sound board in which is a round sound hole, below which is the bridge; the neck, having a flat finger-board fitted with 17 frets, and the head, which is slightly bent back from the finger board and holds the 8 pegs for the strings. These are carried from the pegs across the nut, and over the bridge to the tail piece at the lower end of the instrument. The strings, 8 in number, are tuned in pairs, thus:



Thus, it will be seen, is identical with the tuning of the violin. The strings are usually of steel, the two lowest pairs (D and G) being wound round with fine wire. The compass is completely chromatic from the low G to the A three octaves and a note higher, though the highest five notes are not very useful. The 17 frets are necessary for the full compass, as

Open Strings																				
				F	F#	G	G#	A	Bb	B	C	C#	D	D#	E	F	F#	G	G#	A
1st																				
2nd				B	C	C#	D	D#	E	F	F#	G	Ab	A	Bb	B	C	C#	D	
3rd				Eb	E	F	F#	G	Ab	A	Bb	B	C	C#	D	Eb	E	F	F#	G
4th				Ab	A	Bb	B	C	C#	D	Eb	E	F	F#	G	Ab	A	Bb	B	C
				Frets 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th																

Mandoline. Table showing arrangement of notes on strings in relation to frets

the fretting proceeds by semitones. The table below will make this clear.

As the tuning is like that of the violin, so also is the fingering, that is on the 4th string both A flat (G sharp) and A natural will be produced by pressing the string behind the respective frets with the first finger, and B flat (A sharp) and B natural by similarly using the second finger. In order to get higher notes beyond the reach of the little finger, the hand must be shifted down the neck. If on the 4th string the B were played with the first finger, the hand is then said to be in the second position; if it played C, then it is in third position, and so on. The strings are plucked with a plectrum of horn, tortoise-shell, or some other material held in the fingers of the right hand.

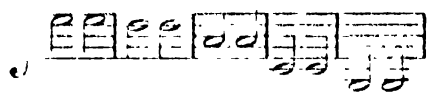
Before beginning to play, the strings must be tuned. The standard is the second pair, which must be made to agree either with an A tuning fork or with the A on the pianoforte. The latter course is necessary if the piano and the mandoline are to be played together. Having done this, tune the D strings from it, and then the G strings from the D, finally tuning the E strings from the A. It is preferable not to tune each string to the piano, as on that instrument fifths are made a shade flat, but to tune perfect fifths as violinists do. This needs a keen ear and a knowledge of the desired result, so it is well to listen to a properly tuned violin and try to memorize the sound of the perfect fifth between each adjacent pair of strings. An easy way of testing the correctness is to press the A strings behind the fifth fret, which will give D an octave above the third string. A further test is to use the seventh fret on the D strings. If the tuning is right, the result should then be in exact unison with the A strings.

The instrument should be held with the left hand round the neck, the fingers turned over the finger board. The performer holds it against him, the right forearm keeping it in position, while the right hand, holding the plectrum, plucks the strings just over the plate which is found on the sound board below the sound hole. The right wrist must be perfectly free in its action. Both down and up strokes are employed, indicated when necessary by A and V respectively.

Initial practice will be devoted to finding the open strings, using only the down stroke at first, but subsequently alternating up and down. When certainty has been attained in this, proceed to the study of fingering, for which the joints of the fingers must be squared and the tips firmly pressed upon the strings behind the proper fret. Early exercises should involve no shifting of the hand, which should be practised only when easy passages in the first, or normal, position can be played with fair facility.

As with all plucked instruments, the tone of the mandoline is evanescent; consequently, when the effect of sustained sound is wanted, it has to be suggested, rather than actually produced, by means of the tremolo, which

consists in keeping the strings in constant vibration by means of rapid alternate strokes. For this an absolutely lisson wrist is essential. From the frequency of its employment, the tremolo may be regarded as a characteristic of the mandoline, and therefore it must be carefully practised.



The tuning of the Milanese mandoline, or mandurina, is shown above.

The fingering differs entirely from that of the Neapolitan mandoline, but if the principles underlying the above explanation of the Neapolitan mandoline have been clearly comprehended, anyone with aptitude and industry will soon be able to play the Milanese variety of the instrument.

MANDRAKE. This is a perennial herb of the genus *Mandragora*, which flourishes in shady corners in loamy soil. The root is often forked, with a supposed resemblance to human limbs that formerly led to various superstitious beliefs being associated with the mandrake. *Officinalis* bears blue flowers in May; autumnalis, purple blooms in September.

The supposed resemblance of mandrake root to the human body has given rise to a perfectly groundless belief in its efficacy in furthering conception. The root has medicinal properties, however, and has been used as a narcotic and hypnotic. It contains an alkaloid, mandragorine, which acts similarly to atropine, and poisoning by the drug is like that due to belladonna, and should receive treatment on similar lines.

MANDREL. The steel spindle in the head stock of a lathe is a mandrel, and the name is also given to a bar of steel provided with conical holes at either end. These holes are provided to enable the bar to be mounted upon centres in the lathe or other device, so that when the bar is revolved it will turn perfectly truly about these centres.

The bar is used to support an object to be turned in the lathe, which must have a hole through it of such a size that it will fit tightly on to the mandrel. Work so held can be machined all over, and it can be removed and replaced in the machine many times without fear of its being out of truth.

The Verschoyle patent mandrel is an inexpensive lathe for light wood and metal turning, spinning, etc. It clamps on to the edge of a bench or table and is thus very handy for the home worker who has not a permanent workshop. This particular mandrel is described and illustrated in this work in the article Lathe.

MANGE. This skin disease can affect all domestic animals, including poultry. It is caused by a parasite so small as to be invisible to the naked eye. The mite that produces mange is propagated by eggs, consequently cleanliness is one of the best ways of combating it. Dirt certainly harbours mange, although it does not produce it, and if they are undisturbed the mites hatch and multiply with great rapidity. The different species of parasites each have their own particular hosts, and seldom thrive if transferred to an animal of another species. It is possible, however, for human beings to become infested with parasites, these giving rise to extensive inflammation and irritation of the skin if the condition is neglected.

There are two kinds of mange, follicular and sarcoptic. Follicular mange is almost incurable, the reason being that the parasite, by burrowing into the hair follicles and sebaceous glands, is almost inaccessible. The disease begins with a small circular pustular eruption from which the hair falls, and it probably

spreads all over the body, the skin becoming corrugated and of a bluish colour. There is little itching. To treat a dog or other animal suffering from this form of mange, bathe it with balsam of Peru and alcohol in equal parts, or creolin and alcohol in equal parts, or a 2 p.c. solution of formalin.

Sarcoptic, commonly called red mange, spreads rapidly, the parasites being on the surface, and the irritation is considerable. Small red spots are first seen, from which unpleasant matter is exuded. These soon spread into big patches. Powdered sulphur with 8 parts of vegetable oil is recommended,

applied very liberally for a week or 10 days at intervals of 3 or 4 days. If a dog is infested, its bedding should be burnt and the sleeping box, basket, etc., be disinfected before it is used again. See Dog.

MANGEL WURZEL. This root crop is an excellent food for pigs and other animals, one reason being the large amount of sugar it contains. Mangels should not be given to animals until they have been stored for some months. This should be done as early in the autumn as possible, and mangels will usually be found to keep in good condition, if required, until the following midsummer.

MANGLES: THEIR CARE & REPAIR

Advice on an Important Feature of Laundry Work

Other entries dealing with this essential branch of domestic work include Ironing, Laundry; Starch; Soap; Wringer.

A mangle is a machine for pressing clothes and linen. Large articles of a plain or coarse type, such as bed sheets and towels, are generally subjected to this treatment, which is in many cases merely a preliminary to or a substitute for ironing. The art of mangling consists mainly in laying out the clothes smoothly and arranging them so that those of equal substance shall come together. This will ensure an even, regular surface and an equally good pressing for all. Most articles are folded two or three times, and come out better than when arranged in single folds. This is because the thicker the substance the tighter is the pressure of the rollers. Care must be taken, however, to see that too thick a substance does not result, otherwise the rollers may be badly strained.

The ordinary mangle consists of two heavy rollers, usually of hardwood, and made to revolve by means of a cog-wheel attached to one end of the lower roller, which engages a cog attached to the spindle of a wheel turned by hand.

The rollers and cogs are fixed to an upright frame, and pressure is applied to the rollers by a tension screw which levers against the top of the frame.

A table mangle, suitable for use in small families and where space is limited, is made without a tall frame, but instead has clamps

to fix it to a table or bench. The rollers measure approximately 16 in. by 3½ in., those of the standard type 21 in. by 6 in. to 27 in. by 8 in. Another model is fitted with a turn over table; the back board is made much larger and without ledges, so that when the machine is not required for laundrywork the board rests flat on the machine and forms a useful wooden table 36 in. by 20 in. Where these table mangles are not in use, and a large mangle is considered unnecessary, wringing machines are often used as substitutes. These, however, do not press the clothes in the same way as a mangle.

Electric Machines. Special electric washing machines with mangle and wringer combined can be obtained. Their initial cost is rather high, but they afford a great economy of space and time. In some of these machines a wringer alone is found. These are intended to serve the purpose of a mangle and have gullers of the finest rubber.

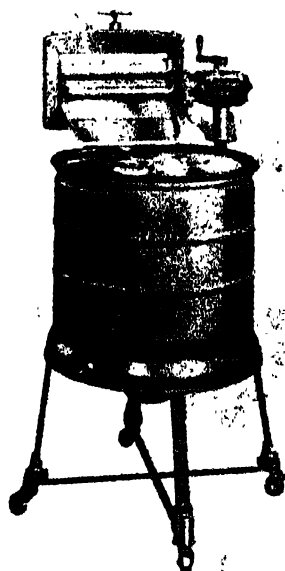
The illustration on the left shows an electrically-driven mangle and wringer combined and mounted on a washing-machine. The lever on the left of the roller-tension screw is for the immediate release of the tension between the rollers. A motor of about ½ h.p. does all the work in an hour, at the cost of ¼ unit of electricity.

Important Points. When selecting a mangle, the following points should be noted. The cog wheels or cham should be protected with a metal case, so that children cannot get their fingers caught. At least two whitewood shelves should be provided, the grooves for the lower one being in a sloping position, so that it can act as a drip board. The tension screw ought to produce even pressure along the length of the rollers.

The bottom roller gets greater wear, and for this reason is often made of lignum vitae. On no account must both lower and upper rollers be made of this or any other very hard wood, or the strain on the clothes would be too great, resulting in small holes, and, in extreme cases, when wet clothes have been passed through the machine unevenly, in straight cuts in the fabrics. When renewing rollers, care must be taken that the top roller is made of softer wood than the lower one.

Both rubber and wooden rollers are damaged, but chiefly the former, by wringing very hot clothes, for great heat perishes rubber. To clean rubber, washing is purely successful; a rug moistened with turpentine is necessary to remove any soap curd and dirt which collect on rubber rollers. When not in use, the tension screw should be loosened so that no strain remains on the rollers. It is tightened up according to the thickness of the material to be passed through the rollers.

The mangle should be oiled regularly with thin machine oil; thick oil collects dust and



Mangle. Combined mangle and wringer mounted on electric washing-machine. Note soft rubber rollers, to prevent injury to buttons, and quick release lever which instantly removes pressure.

Courtesy, General Electric Co., Ltd.

ologs the working parts. From time to time the working parts should be freed from all grease and dust. paraffin is a quick cleanser if applied on a soft cloth. The metal framework ought to be washed from time to time with warm soapy water, then rinsed in clean water. When the paint commences to chip or wear, the frame should be well rubbed down with fine glasspaper and two coats of enamel applied. The exposure of bare ironwork may result in ironmould on the clothes.

When not in use a mangle should be covered with a dust sheet to protect it from dust and grease. It should not be stored out of doors without some protection, and if a small wooden shed or lean-to is not available, an old tarpaulin will serve.

Repairing a Mangle. After being in use for some years a mangle shows signs of wear principally in the rollers and other wooden parts. Metal parts may be replaced without difficulty if the machine is one of standard make. Of the two rollers, the bottom one wears hollow before the other, and it will pay to have them trued up once or even twice, but there is a limit to the amount a roller can be reduced in diameter without fitting new star wheels to allow for the difference.

Unless the rollers have a stout cap or ferrule on the ends there is a tendency for the wood to crack and split. Rollers that have been kept in a dry place and not used for some time are very liable to crack, unless such openings are filled up the mangle will not give satisfactory results. Small cracks can be made good with a waterproof wood-filler, worked in with a fine blade and carefully smoothed on top. When the filler sets, the surface of the roller should be smoothed with glasspaper.

Newly turned surfaces should be protected with a varnish made by dissolving 2 oz. of white shellac and 2 oz. of benzoin in sufficient methylated spirit to form a paste, and then adding 1 oz. of beeswax which has been dissolved in a small quantity of turpentine. This should be applied while the roller is revolved.

The wheels are made of cast iron, and as replacements are not costly it is not worth while to have new teeth fitted. If one of the cogs should get broken off, the wheel should be removed, and coated with blacklead on one side so that a rubbing may be made on a piece of paper of the exact shape, including the centre hole. The maker or ironmonger will then be able to supply a new wheel from the pattern provided.

In the event of the wooden handle breaking or splitting, it may be renewed by hling round the end of the iron rod and removing the washer; the new handle should be slipped in place and the end of the iron riveted over with a hammer. The drip board as well as the table is liable to wear, and if the surface is good, the strengthening battens on the ends may be replaced with new pieces. In renewing the strips use beech or sycamore.

When renewing the paintwork, the handle, guard and wheels should be taken off and the ironwork scrubbed with soda and hot water to remove grease and dirt. The framework, spring bow, handle of pressure screw guard, bearing, fly-wheel and collar, with bolt heads, etc., should be painted in colour; the outside of wheels should be coated with Brunswick black and screws and cog surfaces coated with blacklead. In replacing the wheels, the keys should be driven in with a hammer and cold chisel.

MANHOLE. In building and other constructive work any aperture of sufficient size to permit of the passage of a man is known as a manhole. The term is also applied to smaller apertures, as, for example, those fitted to a kitchen boiler. The manholes used to cover the openings provided in the sanitary system for the cleaning out of the drains usually comprise a framework of rectangular or other shape that is built into the brickwork. The cover or lid is provided with a lip which fits into a slot or groove round the top edge of the frame. This groove should be filled with cast grease and sand, or some other composition, to render it airtight. In small work the covers are usually kept in place by their own weight and are lifted by means of grips. See Drains.

MANICURE. This name is given to the treatment of the hands, especially the finger nails. The set of implements and cosmetics used for this purpose can be bought separately from chemists, or complete in cases, differing in price according to size and quality. They include usually - nail polish, a polisher, a small bottle of liquid bleach, cuticle cream, orange sticks, emery board, some cotton wool, a file, and a pair of manicure scissors, which have frequently short curved blades. See Hand, Nails.

MANNA ASH.

The manna or flowering ash is *Fraxinus ornus*, a handsome small tree, which bears white blooms in early summer. The popular name of manna ash arises from the use of the exuded sap as manna. It is quite hardy and may be grown in London and other gardens.

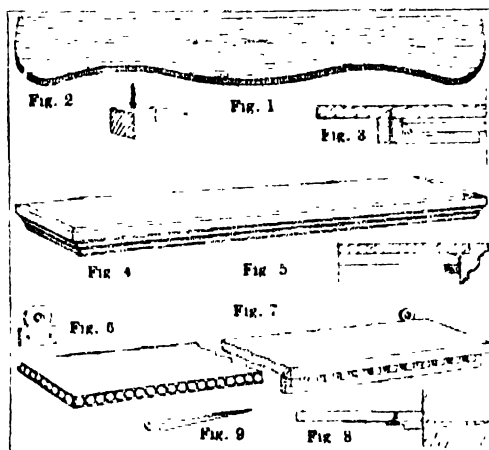
MANSARD ROOF. This is a style of roof construction in which the roof is formed of two sections inclined at different angles, or having two separate slopes. It is often undertaken on the score of economy, as the bulk of the roof space may be used for rooms, and what would have been the outer walls are built with roofing material. Another advantage is that it reduces the height required with the steeply-pitched roof. The proportion between the slope of the lower and upper portions is important; a good outline is generally obtained by making the lower slope 60° and the upper one 30°.

The example illustrated comprises a king post, roof truss,

properly framed up and strengthened with iron straps and cast-iron shoes. The tie beam is supported on a king post, which, in turn, bears upon the bottom tie beams. When modified this class of construction has many features of interest to the builder of small houses, as it is a cheap and efficient type of roof, and offers considerable scope from the architectural point of view. See Roof.

MANSERVANT. All men who are employed in and about the house - chauffeurs, gardeners, grooms, butlers, valets, footmen. All come within the National Health Act, and if employed for gain (e.g. in a hotel) within the Catering Trade Wages Act. Private gardeners, gamekeepers, and grooms, when not employed for gain, are covered by the National Health Act.

MANTELBOARD. Some mantelshelves are so narrow that it is necessary to fit on wide boards if they are to be used to hold clocks and ornaments. A shaped mantelboard, as shown in Fig. 1, is often used, the edge being covered with gimp. The best method



Mantelboard. Fig. 1. Shaped board. Figs. 2 and 3. Method of attaching board to shelf. Fig. 4. Straight mantelboard, finished with moulding. Fig. 5. Moulding attached by rebate. Fig. 6. Brass mirror plate for fixing board to wall. Fig. 7. Decorative dentil pattern. Figs. 8 and 9. Method of securing mantelboard by means of wall holdfast.

of attaching the board to the shelf is shown in Fig. 2, this is a block of wood, notched out to the thickness of the shelf and then screwed on. One of these clips should be used at each end, as shown in the end view at Fig. 3.

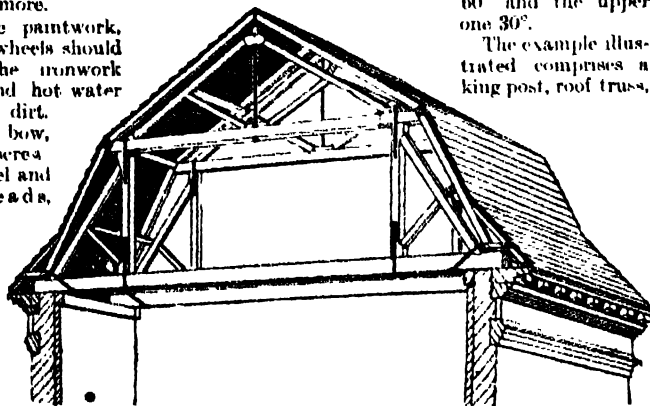
Another form of shelf is shown in Fig. 4. An oblong board is cut to the required length and width and the front and ends finished with cabinet moulding, either glued, screwed or nailed on direct, or rebated as suggested in the section at Fig. 5. A large variety of shapes may be obtained and picture frame mould-

ing may be utilized. Perfectly plain lengths of board may be edged with half round ball or Jacobean beading, and, instead of the under button or clip, a pair of brass mirror plates for nailing to the wall may be screwed on as in Fig. 6.

A good decorative effect may be obtained by a dentil pattern, as in Fig. 7, the dentils should be square in the front view and about half the front dimension in thickness. They should be glued on a strip about double the height of the dentils. A further method of securing mantelboards is shown in Fig. 8. An ordinary wall holdfast, as in Fig. 9, should be driven in the wall with the eye uppermost and a screw driven into the board.

MANTELPIECE. For almost all practical purposes the mantelpiece and the chimney piece are identical. Strictly speaking, however, the mantelpiece is only a portion of the chimney piece, for the latter embraces the whole protective structure around the fireplace from floor to ceiling, while the mantelpiece is only its lower part. Mantelpieces are made commonly of wood, marble or iron. Iron ones can be standardized and turned out in thousands. The wooden ones are often beautifully carved, and both kinds are sometimes inlaid. Stone and faience are also used for mantelpieces.

The mantelpiece which is not in itself satisfactory or decorative should be painted or stained with due regard to the general colour scheme of the room. The wooden variety calls for no



Mansard Roof, formed of two sections inclined at different angles

special treatment, beyond taking care to clean the work before beginning to paint, and stopping any little holes or cracks that may be visible with hard stopping.

The marble mantelpiece is very difficult to colour in a satisfactory manner. One method is to roughen the surface with sandpaper and use flat colours; another is to apply special transparent stains; but these are not very durable. Cast-iron mantelpieces are amenable to treatment if they are well sandpapered before applying the first undercoating, after which they may be painted in the same way as woodwork. See Chimney Piece, Fireplace, Gas, Grate.

MANTILLA. Spain's national head-dress may be white or black. The material is silk blonde lace, and though a great deal of this is machine-made, the best examples of the mantilla are bobbin-made, showing the heavy floral design with finer filling lace stitches on a delicate net ground.

A mantilla is partly shaped and folded so that when placed on the shoulders the straight piece may be drawn up and draped

over the high standing comb at the back of the head, and the shaped flounce forms a graceful cape. Mantillas are sometimes worn as evening wraps. See Lace.

MANTLE. In one of its senses a mantle is a form of cloak. In another sense a mantle is a piece of network, conical in shape, covered with some highly refractory material, that becomes luminous under a flame and is therefore used to add to the illuminating power of gas. See Gas Mantle.

MANTLING. All the cloths used for women's outer coats are included under this description. The variety ranges from soft, smooth woollen velours, blanket cloth, and showy tweeds to moiré silks, matchless and imitation furs. Mantle cloths are wind-proof in very different degrees, and for winter wear it is desirable not to choose too open a texture.

In buying mantling, regard should be paid to the back as well as the face, both as to its appearance and as to its suitability for an unlined garment. Thick, solid cloths are not easy to cut out, and require tailor's skill and heavy ironing to look well.

MANURES FOR THE GARDEN

Natural and Artificial Fertilizers and their Uses

Detailed information on the manuring of various plants will be found under the separate headings, e.g. Asparagus, Celery, Cucumber, Endive, Horradish, etc. See also Compost Heap, Fertilizer, Fruit Garden, Hotbed, Kitchen Garden, etc.

Food or stimulant for trees and plants grown in the garden consists either of the ordure of animals, farmyard manure as it is called, or of chemical or artificial fertilizers. The three chief plant foods are nitrogen, phosphates and potash. Natural or farmyard manure contains all three. A fourth substance, lime, is required, not so much, however, as a food for plants as on account of its chemical action on the soil.

Natural Manures. Natural manures and road sweepings found in or near towns are of little value, as they are usually impregnated with petrol and oil, and are therefore injurious. Spent hops, leaves and decayed green refuse are valuable manure substitutes. Among the best artificial manures, although it is really a natural product, is guano. Dried blood, bone manure and bone meal are also useful for various purposes.

A good chemical manure for general application consists of superphosphate of lime, 5 parts, and sulphate of ammonia, 2 parts; the mixture should be applied at 2 oz. per sq. yd., or diluted in water, 1 oz. per gallon.

Sulphate of ammonia and nitrate of soda are the two chief nitrogenous manures: they promote leaf growth and are used at the rate of 1-2 oz. per sq. yd. of ground. Superphosphate of lime, basic slag, and bonemeal are phosphatic manures which help in the building up of stems and the development of flowers and fruits. Basic slag should be applied in autumn, 4-6 oz. per sq. yd. of land, the others in spring at 2 oz. per sq. yd. Potash is present naturally in most soils, particularly in clayey ground, but it may be supplemented by the use of sulphate of potash, 1-2 oz. per sq. yard in spring and

early summer. In the case of heavy soils, manure is best dug in during the autumn and winter, but with light soils this should be done in the spring. An average dressing of manure for vegetables is about 2½ cwt. to the square rod, i.e. 30½ sq. yd. When manure has to lie for some time in a heap before it is used, it should be covered with about 6 in. of soil to preserve its essential constituents.

With the increasing use of the motor for transport and other purposes, both in town and country, farmyard and stable manure is available in less quantities than formerly. One of the most effective ways of replacing this shortage of natural manure is by growing and digging in a green crop, e.g. rape.

If sown broadcast at the rate of 1 oz. per rod on land which becomes vacant from July to the end of August, and raked into the surface soil, such crops will be ready for digging in from end of October to end of November, according to date of sowing.

Soot. One kind of manure, soot, is available for most gardens, and another, poultry manure, for many. Soot is chiefly valuable

on account of the nitrogen it contains, but it also improves the working qualities of the soil. If possible, it should always be stowed in a dry shed for some time before use. When used for manure lime and soot should never be mixed, or the lime will drive off the ammonia in the soot. Six cwt. of good soot is equivalent to a cwt. of sulphate of ammonia. Poultry manure should be stored in alternate layers with an equal bulk of dry soil in a convenient receptacle, or in a heap in a dry shed until it is needed. It may be turned twice or three times, and, after such treatment, should be applied to all crops at the rate of from 4 to 6 oz. per sq. yd.

Liquid Manure. Liquid manure can be made in the following ways: Take a peck of poultry manure, or a peck of sheep droppings, and place this in a 40 gallon cask. Fill this with water, and after standing 24 hours it should be ready for use. This makes an excellent manure for application to fruit, flower, and vegetable crops during the growing season, the rate being 2 gallons to the sq. yd.

Lime. Lime is most valuable on heavy clayey soils. It may be applied either in autumn or early spring, one bushel per three rods of ground, but it should not be put on at the same time as farmyard manure. It is best to do the digging and manuring in the autumn or early winter, and to apply the lime in the dry, shaked form about the beginning of March. Lime should be hoed or raked into the top 3 in. of soil; not be dug in or buried deeply.

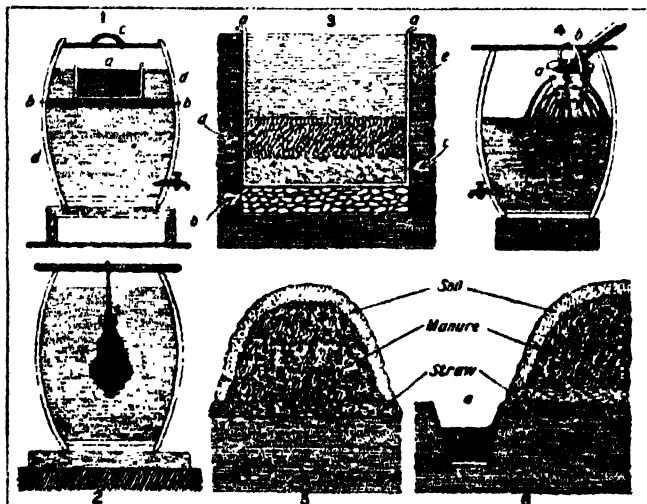
In Bulletin 36, from which much of this information is taken, the Ministry of Agriculture makes the following suggestions about manuring the various individual crops.

Manuring Potatoes and Cabbages. In the case of potatoes where the crop is grown on the flat, sulphate of ammonia should be applied on the surface just before the first earthing up at the rate of ½ oz. per sq. yd. or 1 lb. per rod. Where potatoes are planted in drills the sulphate of ammonia may be applied in the drills at the time of planting. Superphosphate of lime should be applied at the rate of 1½ oz. per sq. yd. (3 lb. per rod), and may be forked in lightly before planting on the flat, or applied in the drill at time of planting. Superphosphate and steamed bone flour may be mixed in equal proportions and applied, when planting, at the same rate.

All the members of the cabbage family respond to applications of nitrogenous manures. Sulphate of ammonia should be applied at the rate of ½-¾ oz. per sq. yd. (1-1½ lb. per rod) before the first earthing up, or as soon as growth starts. Superphosphate, or superphosphate and steamed bone flour in equal proportions, should be used at the rate of 1 oz. per sq. yd. (2 lb. per rod) at the time of planting, or before the first earthing up. In inland districts, where allotment crops on light and medium soils are liable to suffer from drought, salt is very helpful. It should be applied at the rate of 1 oz. per sq. yd.

Manuring Other Crops. Crops belonging to the pea and bean family can usually provide themselves with sufficient nitrogen. A mixture of superphosphate and steamed bone flour in equal proportions should be applied to the ground before or after sowing the seed, at the rate of 1 oz. to 4 yd. in length of drill. The manure should never be sown in the bottom of the drill in direct contact with the seed. Basic slag may replace the superphosphate and steamed bone flour, and be sown at the rate of ½ lb. to 4 yd. of drill.

For onions, leeks and celery, sulphate of ammonia should be applied at the rate of ½ oz. per sq. yd. (1 lb. per rod), with superphosphate and steamed bone flour, mixed in equal proportions, at the rate of 1 oz. per sq. yd. On light soils, liable to dry out, salt may be given with advantage (1 oz. per sq. yd.).



Manure. 1. Liquid manure: a, solid manure in box or bag; b, wooden rest; c, lid; d, water. 2. Soot water, bag of soot suspended from stick. 3. Open ground tank; a, sunk tank; b, brickbat; c, straw; d, manure; e, water. 4. Soot water manure; a, holed pall of manure; b, drainpipe from roof. 5. Manure stack. 6. Same with sunk pall to collect draining liquid

These crops should all be manured in the early stages of their growth.

For carrots, parsnips and beet, sulphate of ammonia should be applied at the rate of $\frac{1}{2}$ oz. per sq. yd. after sowing. Superphosphate and steamed bone flour, mixed at the rate of 1 oz. per sq. yd., should be applied before sowing the seed. On dry soils, 1 oz. of salt per sq. yd. may be applied before drilling. Lettuce, spinach, and radishes are greatly helped by applications of sulphate of ammonia, which should be applied at the rate of $\frac{1}{2}$ oz. per sq. yd. in the early stages of growth. Where radishes do not bulb readily, superphosphate, at the rate of 1 oz. per sq. yd., should be applied to the soil before sowing.

MANZANELLA. Made from a highly prized species of grape, manzanella is a shrubby vine with a fragrant floral bouquet and an aromatic flavour. It is said to take its name from its similarity to a wine produced at a place called Manzanella, which is situated some 25 miles from Seville. It is a good beverage wine and goes with most table dishes. See Sherry; Wine.

MAPLE. This is the common name of a large group of hardy trees and shrubs known botanically as acer. They thrive in ordinary well drained loamy soil. Of the trees the most familiar are the sycamore (*Acer pseudo-platanus*), Norway maple (*platanoides*), the common maple (*leampestre*) and the variegated box elder (*Negundo variegatum*). The last named is a most decorative small tree with green and white leaves.

There are many beautiful varieties of the Japanese maple shrubs which like a somewhat sheltered position: the young leaves are charmingly tinted in spring, and in some the autumn colouring is attractive. A few of the most beautiful of the Japanese maples are *roseo-marginatum*, *septemlobum elegans*, *Osakazuki* and *atropurpureum*, which are varieties of *Acer palmatum*, *aurum* and *laciniatum* are varieties of *acer japonicum*. These shrubs are slow growing. Maple sugar is made from the sap of the tree.

Uses of the Wood. The wood of the maple is light in colour, ranging from white to yellowish brown and grey. It is heavy, hard, tough, and fine-grained, with a lustrous surface, especially when cut radially through the centre of the trunk. This sometimes has a wavy or mottled appearance showing alternate light and shade across the surface. A variety called bird's eye maple has a speckled curly grain, and is used chiefly in the form of veneer.

Maple does not easily splinter, and is excellent for floorboards and other interior fittings. It takes stain well and is easily polished. It is used for furniture, plywood, firewood, turnery, musical instruments, dairy woodwork, wood spoons and platters, and rollers. A bog maple, out from peat, and pale blue in colour, is sometimes used for veneer and small articles. See Wood.

MARABOUT. The name is that of a bird, and the original marabout was a tuft or plume of soft or grey feathers from beneath the wings and tails of storks, herons, and adjutant birds, and used as a millinery trimming. The term has been extended to cover fluffy feather trimmings, ruffles, stoles, wraps, and valuable coats having no necessary connexion with marabout birds.

Prepared feathers are braided or corded together with their soft fronds projecting to make exceedingly light trimmings weighing much less than fur and giving similar warmth. They do not wear nearly so well as fur, but often look very becoming for dressing gowns and jackets. Marabout loses substance in wear by detachment of the feathers from the central binding cords, and the articles should be handled lightly and with care. Washing

is often detrimental, but marabout articles may be dipped in a warm soapy lather and dried by being shaken in front of the fire; they should not be crushed in storage.

MARASCHINO. A fine, delicately flavoured variety of cherry known as marasques is the source from which maraschino is distilled. It is a sweetish liqueur with a subtle taste, and is often used to flavour fruit salads and in some cocktails. A maraschino cherry is often placed in the half of a prepared grape-fruit, and in a cocktail glass containing a sweet liqueur. These cherries are bottled in maraschino.

MARBLE. There are many kinds of marble, some of the best of the English varieties being found in Dorset. Purbeck is a mottled grey, which takes a fine polish and is suitable for decorative work. A fine black marble, known as Mento, comes from Galway. Connemara, a blue green, and Churchtown, a red marble, are also quarried in Ireland.

Beautiful examples from Derbyshire, Staffordshire, and Devonshire are notable for their delicate colourings, and are employed for carved table ornaments and chimney pieces. Some of the most handsome varieties come from Greece. Pure white, from Carrara, in Italy, is used for sculpture and for expensive carving and ornamental work.

Decorative Uses. The purposes for which the various kinds of marble are employed depend largely on their weather-resisting qualities. Red Ozwell, which is a particularly soft type, will not retain its fine polish out of doors, and is consequently reserved for household use. It is made into mantelpieces, fenders and pedestals for marble or bronze figures. Dove marble, another soft variety, is of a pale grey colour, and, because of its high polish, is specially adaptable for paneling and wainscoting. Lake and Ozwell and other coloured marble, it never discolours.

Mottled marble, a variety of white Sicilian, is also used for paneling, because of its fine markings, the slabs being arranged so as to form diamonds and other patterns. Unlike the coloured marbles, this is a hard type, and can be used equally well out of doors in the form of flower vases for the garden or terrace steps. Veined white Sicilian marble varies from the mottled only in the markings, and is employed for very much the same purposes.

Among the choicest and most of the many articles executed in marble are pictures wrought by Italian craftsmen, in almost every variety and colour of marble, including bright emerald green, the supply of which is extremely limited and crimson, which is equally rare. As a rule, these pictures are portraits rather than landscapes or seascapes, and usually fetch high prices. They are generally framed in mahogany or oak.

Domestic Uses. As used in the home, marble takes the form of wash-basins, table tops, pantry shelves, mantelpieces, curbs, etc., its chief advantages being that it is sanitary, cool to the touch, and easily kept clean. Due, moreover, to its natural composition, which contains lime, it has the further property of being germ-destroying, and so is especially suitable for lavatories.

Its cooling properties are best revealed in the pantry, where, in the form of shelves and receptacles for butter, milk, etc., it is the most practical material. In the hottest weather it remains at a comparatively low temperature, and diffuses its coolness to such foods as would otherwise easily melt. For the same reason it is of essential value for storing meat. Slabs for the purpose are sold cheaply at most monumental works.

Plain marble curbs may be put together at home, parts for which may be cheaply obtained. Three blocks of the required measurements should be bought, two being

of short lengths for the sides, and the other as long as the hearth itself. These blocks may be polished or unpolished. Outside the house marble is used for door-steps and terrace ornaments.

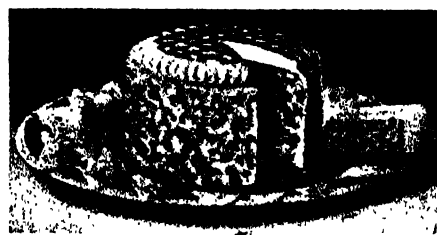
Cleaning Marble. When discoloration occurs a little crystallized oxalic acid should be dissolved in water, and the mixture applied. Meat or vegetable stains require other treatment; $\frac{1}{2}$ lb. each of stone putch and pipeclay should be mixed in water with a little oxalic acid added to form a paste. Cover the stain with this preparation and let it remain overnight. The application should be repeated until the stain vanishes. Mineral stains caused by rusty nails, etc., rarely yield to treatment, but may be subjected to the above application. Unpolished surfaces should be rubbed vigorously with pumice stone and water. A polished or glossy surface can be produced by a mixture consisting of four parts of oxalic acid to one part of sulphate of lead. This should be applied with a wet flannel cloth and a brilliancy that will last for years will then be obtained.

When marble has been exposed to the air for any length of time without attention the stains formed may be removed by just applying potash water and rubbing it down thoroughly, afterwards washing clean with hot clean water and then water with a few drops of hydrochloric acid in it, although care should be taken not to add too much hydrochloric acid.

Another method that is sometimes used is to apply equal quantities of soft soap and pearl ash with a soft rag, washing it off after a few minutes with warm water, and finishing with a soft dry flannel. If there are no stains a good plan is first to rub olive oil on to the marble and then rub down thoroughly with a soft rag, or a solution of 2 oz. soda carbonate in a quart of water should be well scrubbed down the marble, finishing with a soft rag.

Marble table tops, the tops of washstands and other articles when cracked or broken may be riveted as is described in the article on the repair of crockery. The rivet holes need only be drilled half way through from the back of the material. The rivets are fixed in the holes by filling them with plaster of Paris mixed with water. The joint should not be coated with the plaster, but if desired when the top is finished, and the marble top replaced, the crack, if at all visible, may be filled with plaster by working it in through the top and colouring with suitable pigments to match the existing work.

MARBLE CAKE. To make a marble cake, prepare and bake a cake according to directions given for Russian cake, cut this up into pieces of all shapes and sizes, and stir them



Marble Cake, a fancy cake with icing top

into a little sieved apricot jam melted in a pan over the fire. Line a tin with grease-proof paper, and pack in the cake mixture, blending the colours prettily. Put a lid with weights on it over the cake and leave it for an hour or two. Then turn it out carefully, putting the most level side uppermost. Pour over it some white glacé icing and decorate the top with wavy lines of chocolate glacé icing applied with a forcing bag and plain pipe. See Russian Cake.

Marbling. See Gramming; Lacquer Work.

MARCH

What to do in the Garden

Flowers

Sow hardy annuals if the soil is reasonably dry.
Plant the corns of gladiolus, Cape Hyacinth and montbretia.
Prune rose trees at the end of the month.
Sow ten-week stocks, asters and other half-hardy annuals in the greenhouse.
Plant border carnations and hardy herbaceous perennials.
Prepare the site for a new lawn.
Sow seeds of hardy perennials in boxes of soil in a frame.
Take cuttings of border chrysanthemums.

Plant the roots of the ground and bush fruit trees.
Sow melon seeds in pots.

Fruit

Finish pruning and planting fruit trees.
Graft fruit trees.
Weed strawberry beds and plant out last autumn's runners.
Disbud vines and peach trees grown under glass.
Spray fruit trees with lime-sulphur.
Strew fresh slaked lime on the surface of

Vegetables

Remove offsets from globe artichokes for propagation.
Make a first sowing of carrot at the end of the month.
Sow cauliflower in a frame or in the open.
Sow leeks and onions.
Get in early potatoes.
Sow mustard cress and radishes at weekly intervals.
Scatter coal ashes on young peas that are just coming up.

Food in Season

Fish

Barbel, bream, brill, carp, cod, dory, eel, flounder, gurnet, haddock, halibut, herring, ling, mackerel, mullet, perch, pike, salmon, skate, smelt, sole, sprats, tench, trout, turbot, whiting.

Shellfish

Crab, crayfish, lobster, mussels, oysters, prawns, sea bream, shrimps.

Meat

Beef, house lamb, mutton, pork, veal, venison.

Poultry & Game

Capon, capercaillie, chicken, ducks, fowls, geese, guinea fowl, hares, hinds, rabbits, pheasants, plovers, prairie hens, ptarmigan, pigeons, pullets, quail, rabbits, rooks and ravens, snipe, teal, turkey, widgeon, wild fowl, woodcock.

Vegetables

Artichoke, asparagus, brotroot, brussels, cabbages, cardoons, carrots, cauliflower,

celeriac, celery, chervil, chicory, cress, cucumber, endive, greens, horse-radish, leeks, lettuce, mushrooms, onions, parsnips, potatoes (new and old), radishes, salad, savoy, scotch kale, siskale, sorrel, spinach, tomatoes, turnips, watercress.

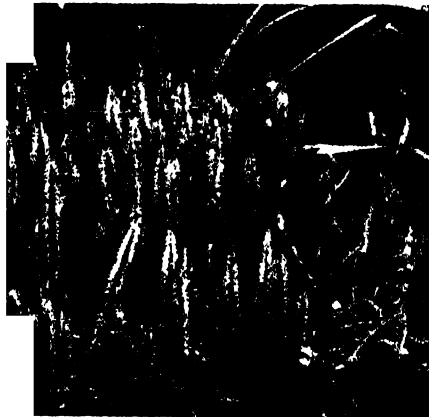
Fruit

Apples, bananas, figs, grapes, lemons, limes, medlars, nectarines, oranges, pears, peaches, plums, apple, rhubarb, various kinds of nuts.

Notes for the Month

MARCH 1 — St. David's Day
MARCH 17 — St. Patrick's Day
MARCH 25 — Lady Day, Quarter Day

MARCOBRUNNER. This famous brand of German hock of fragrant aroma and brilliant colour is the product of the vineyard of Marco-brunn, which stands among the hills some little distance from the Rhine. The output is small, and a great deal of wine which is not grown there is sold under the name of Marco-brunn. See Hock.



Mare's Tail. Hardy rush-like waterside plant.

MARE'S TAIL. This is the common name of a hardy perennial with rush-like stems. A few kinds are suitable for waterside planting, but others are weeds which thrive chiefly in boggy ground.

MARGARINE. Margarine is defined by the Butter and Margarine Act of 1907 as "any article of food whether mixed with butter or not, which resembles butter and is not milk-blended butter." Beef and mutton fat, lard,

water contained in the margarine, and dry sediment resulting from the milk content can be removed by careful straining.

Margarine can be used for making pastry, in conjunction with lard, in the proportion of half lard and half margarine; at a pinch, it can be used alone. See Cakes; Pastry.

The Law About Margarine. Any margarine or any margarine cheese that is imported into Great Britain must bear conspicuously on the ticket the words margarine, or margarine cheese, as the case may require. Margarine must not contain more than 10 per cent of water or more than 10 per cent of butter fats, nor must it contain any preservative prohibited by the regulations.

Any breach of the above provisions renders the offender, whether he be manufacturer, importer, consignee, commission agent or otherwise, liable to a penalty of £20 for the first offence, £50 for the second and £100 for any subsequent offence. The package, whether open or closed, must be printed, or durably marked, with the words margarine or margarine cheese on the top, bottom and sides in printed capital letters not less than 1/4 in. square, and this brand or mark must be on the package itself and not simply on a label.

Further, when these articles are exposed for sale by retail, a label must be on every parcel so exposed in such a manner as to be clearly

whale blubber, and coconut and ground nut oils are used in its manufacture. After refining, the ingredients are churned with milk, and coloured, and salt is added.

It is a wholesome and not too expensive article of food, but because of its milk content it does not keep in good condition indefinitely. It should be used as fresh as possible, and should not be bought in large quantities, unless it can be kept in a refrigerator.

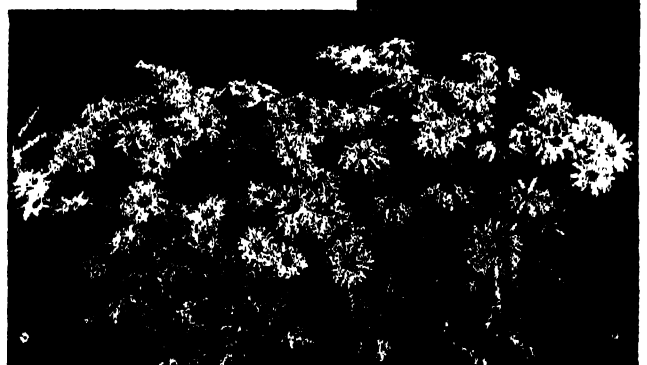
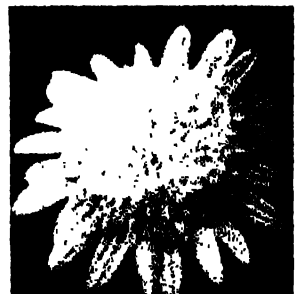
Although it is quite suitable for some cooking purposes, such as for making cakes and sauces, margarine is not so good, generally, as lard or dripping for frying, owing to the milk and salt which it contains. If occasion arises when margarine only is available for frying, the difficulty may be overcome to some extent by placing the margarine in a saucepan on top of the stove or in a basin in a warm oven and allowing it to remain for some time, stirring occasionally. The heat evaporates the milk, and dry sediment resulting from the milk content can be removed by careful straining.

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Marguerite. Flowers of the single variety grown as a pot plant. Above, two large blooms of the double white variety Mrs. Sander.

MARIGOLD. The common marigold is a showy dwarf plant with orange-coloured flowers. New brilliantly coloured varieties have been raised; they should be grown in preference to the old-fashioned kind. Orange King and Radio are especially fine. Once

clavatus, yellow; lilacinus, lilac; amoenus, rosy purple, and venustus, of which there are many varieties.

MARJORAM. The hardy aromatic herb marjoram is used in cookery for flavouring. The plants should be put in rich soil in spring in rows about 15 in. apart on a sunny border. They may be left undisturbed for 4 or 5 years, but the shoots should be gathered just when they are coming into flower, dried in a cool, shady place, and stored. Propagation is by seeds or cuttings of young shoots. Every March a top-dressing of well-decayed manure should be given.

MARKET DAY.

Most towns in Great Britain have markets, some once a week and some twice, the day varying. Such days are known as market days. There are no special market days in London, but in the

majority of the smaller towns they are still important. See Early Closing.

MARKING. Marking personal and household possessions with the name or initials of their owner is usually done by means of marking ink and a pen sold for the purpose. Some people use a stencil specially made to use with marking ink. When marked each article must be left until it is dry. Tablecloths, sheets, and other items of house linen are often marked in this way with the names of their owner, and many persons so mark their pocket handkerchiefs and other possessions. Another method of marking articles of clothing is to write or print the name on a strip of cotton, or other suitable material, and then to sew this on to the garment.

Clothing and house linen can be marked in another way. This is by means of initials, which are worked on to the garment in silk or cotton thread, either in white or colour.

To mark suitcases and other luggage the initials should first be outlined in a suitable size, and then the paint, white or black oil colour, as desired, can be laid between the lines with a brush. Careful measurements are necessary in order to make the letters



Marjoram. Aromatic flowering herb used in cookery

uniform in size and similar also in style. See Initial.

Marking Ink. For marking the name of the owner on clothing, a marking ink ought to be permanent in its effect, and not liable to become faint and illegible after repeated washing of the linen. The best ink for the purpose is one having

nitrate of silver for a basis, but if bleaching powder is used in washing fabrics marked with this ink there is a tendency for the linen to rot into holes at the places where the marking was done. Other bases used are coal tar and aniline.

The manufacture of marking inks is somewhat complicated, but a simple form can be made by grinding Chinese ink with a little water to a thick, smooth liquid, this is dried by placing it in a warm place, and is then reduced to powder. To the powder is added a mixture of coal tar 1 part, mineral naphtha 2 parts, until a thin cream is formed. The resulting ink marks are quite permanent.

MARKING GAUGE. One of the indispensable tools of the woodworker, the marking gauge is used for marking incised lines in the direction of the grain parallel to the edge. It is illustrated and described in the article Gauge (q.v.).

MARL. Largely consisting of decomposed limestone with a small percentage of clay, marl is natural soil which possesses the property of hardening very rapidly. Ordinary marl contains from 15 to 20 per cent of carbonate of lime. Being comparatively immune from the attacks of insect pests, it is much in request for grass courts, and it is sometimes applied to the surfaces of other garden soils as a top-dressing. Marl is used with other ingredients in the preparation of cement, concrete, and other building materials. Marl grass is a pasture grass which is sometimes used in garden mixtures to match existing turf. It belongs to the clover family. See Soil.

MARMALADE: ORANGE AND OTHER MAKES

Directions for Using the Ingredients to the Best Advantage

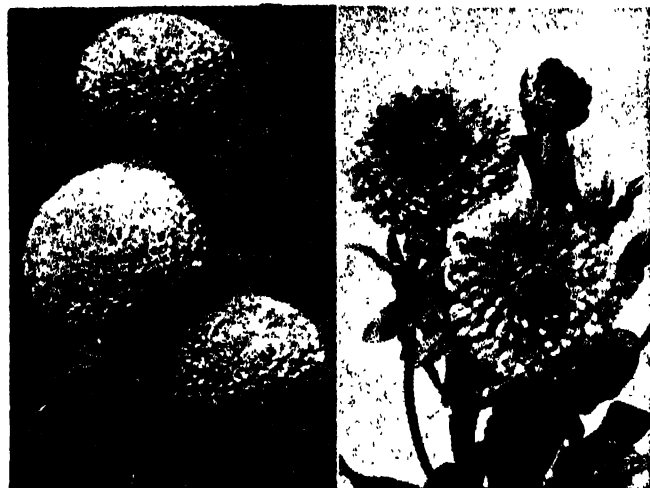
This article contains advice on the best fruit to choose, as well as simple and excellent recipes. See also Jam, Jelly.

Although marmalade is the name originally given to a preserve of Seville oranges, other fruit preserves are now included as marmalades. Sweet oranges and lemons are used in conjunction with Seville oranges; lemons and tangerines make delicious preserves, and grape fruit, melons, pineapples, and quinces are also made into marmalades.

The making of marmalade is rather a tedious process, as much depends on the preparation of the fruit, and this must not be done carelessly if a good preserve is to be made. All the rinds must be shredded finely, and all pips and pith removed. The cutting can be facilitated if a marmalade machine is available; these can be bought quite reasonably, or sometimes a machine can be hired for a shilling or two. Some people prefer the peel sliced coarsely, in short sections, after the manner of Oxford marmalade, in which case it is necessary to cut it with a knife by hand.

Success in marmalade making depends on sound fruit, good sugar, and careful preparation and boiling. Experts say that the earliest shipments of Seville oranges make the finest marmalade, February and March being the best months. Generally they are most plentiful and easily obtainable then. A good quality of fruit should always be used, and it should not be under-ripe or over-ripe. Over-ripe fruit is not worth preserving, as it will not keep, and the marmalade is sure to ferment and turn mouldy in a very short time. Under-ripe fruit is lacking in juice, and contains a large proportion of hard pith and skin, which has to be discarded. Also the under-ripe oranges do not contain enough pectin, the jellyifying quality in the fruit which is essential. No amount of boiling will make the preserve jelly if this quality is lacking.

The best preserving sugar is necessary for a good, well-flavoured marmalade, and in the



Marigold. Left, large, lemon-coloured, globular flowers of the African marigold. Right, orange blooms of the common marigold

introduced into the garden, it will sow itself, and come up the next year in profusion. It is a *Calendula*, while African and French marigolds belong to the genus *Tagetes*, producing brilliant flowers in great abundance.

African marigolds, with their large globular double flowers, are of lemon and orange; they thrive in almost any fertile, friable soil, being raised from seed under glass in February. They grow 2 to 3 ft. high.

Both single and double coloured and striped sorts of French marigolds are available, 1 to 2 ft. high, also miniature single kinds about 9 in. high. *Etoile d'Or*, *Legion of Honour*, *Meteor*, *Diadem*, *Silver King* and *Star of India* make gold edgings. See Fig Marigold; French Marigold; Marsh Marigold.

MARINADE. This is the name given to a brine used for souping or pickling fish and meat. A game or meat marinade is made as follows: In a large earthenware vessel put 2 onions and 2 carrots cut into thin slices, a small handful of salt, a bunch of herbs, including sprigs of thyme, basil and sage, a few bay leaves, peppercorns, mace and cloves. Pour over these 1 pint vinegar and 2 pints cold water, cover the vessel and keep it in a cool place. The meat or game is souped in this marinade before it is cooked.

A marinade for fish can be made thus. A gill of salad or olive oil is mixed with the same quantity of white vinegar, a finely chopped onion, a bunch of herbs, and a little salt and cayenne. The fish is put in this mixture to souge, and is then broiled, or it can be baked in the marinade in the oven. See Mackerel; Pickle, etc.

MARINE GLUE. A special type of glue, used in ship and boat building for making watertight joints, is known as marine glue. It is generally composed of shellac, or caoutchouc mixed with turpentine or naphtha. It can be used under any circumstances where a sound waterproof glue is required. See Glue.

MARIPOSA LILY. This is the common name of *Calochortus*, a group of rather tender flowering bulbs. They should be grown in a bed of well-drained sandy soil in a sunny, sheltered position, as at the foot of a wall. In winter it is wise to protect the bed with a frame "light" to keep off excessive rains. The bulbs should be planted 3 in. deep in early autumn. The flowers are of many charming colours. A few of the best are

long run is most economical, as it reduces skimming to a minimum. Sugar should not be added to the marmalade until the peel and pulp are tender; it is not the sugar that needs cooking, or that causes the marmalade to jelly. Its purpose is to sweeten only.

There are numerous recipes for orange marmalade, all varying a little in accordance with the experience and tastes of the makers. The proportion of water varies in each recipe, but for general guidance it is safe to say that weight for weight of fruit and water will make a solid marmalade, and for a thinner one the water may be increased to a pint and a half for every pound of fruit.

The proportion of sugar varies greatly, though pound for pound is usually advised for all Seville oranges; the length of time for boiling varies according to the quality of the fruit.

Orange Marmalade. A good general recipe for orange marmalade is to allow a pound of sugar to each orange, a pint of water to each orange, and one lemon to every four oranges. Thus to 12 Seville oranges allow 12 lb. sugar, 12 pints water, and 3 lemons. Wipe the oranges and lemons well, quarter them and remove peel from each quarter, and take as much pith as possible from fruit and peel. Cut up the pulp roughly with a knife or put through the marmalade machine. Remove all the pips into a separate basin. Shred the skins finely. Put fruit and peel into an earthenware pan, cover with 11 pints water and leave to soak for 24 hours or longer. Then put the pips with the remaining pint of water in a saucepan and simmer for an hour. Strain the liquid into the prepared fruit.

Put the soaked fruit and liquor into a preserving pan, bring to the boil and simmer for an hour. The marmalade must never boil rapidly, as this toughens the skins. Then add the sugar, stir well and simmer gently for another half hour, removing scum as it rises. Use a wooden spoon, as a metal one will taint the preserve.

Test the marmalade on a plate; if it jellies when cold it is finished, but longer boiling may be necessary. Too long boiling makes the marmalade dark and gummy, so do not leave it too long without testing.

When finished pour off into warmed, dry jars, leave until cold and cover securely, first with a piece of waxed paper on top of the preserve, and then with a thick gummed circle that comes well down the side of the jar to keep it airtight. Store in a cool, well ventilated place.

Jelly Marmalade. To 12 Seville oranges allow 3 sweet oranges and 2 lemons. Peel the fruit very thinly, cutting none of the white

part with it. Cut the peel into the thinnest possible strips and tie them in a muslin bag big enough to allow them to swell. Remove all the white inner rind from the fruit, and cut up the fruit coarsely, making about three pieces out of each. Leave the pips in. Put the bag of orange peel strips and the fruit into an earthenware pan, cover with 12 pints of cold water, and let it stand overnight.

Next day boil all together rather quickly for three hours, then remove the muslin bag and empty the strips into a basin. Strain the pulp twice, and add the strips to the strained liquor. Weigh it, and add an equal weight of sugar. Clean out the preserving pan, and put in the syrup and boil until it sets—about 25 or 30 minutes. Let it stand half an hour before pouring off into jars.

Lemon Marmalade. To every pound of fruit allow 3 pints of water. Slice the lemons very thinly, removing the pips. Let the fruit stand in the water for 24 hours, and let the pips soak in water to cover them. Then strain off the water from the pips and add to the rest, and boil the whole until the lemons are tender. Leave to get cool or pour off into an earthen vessel and leave until next day. Then weigh the pulp again, and to every pound allow 1½ lb. preserving sugar. Boil again until the strips of lemon become transparent and the pulp jellies.

Tangerine Marmalade. Tangerine marmalade is made by using 6 Seville oranges, 2 sweet, 6 tangerines, and 1 lemon. Pare the fruit finely and divide it. Put the pips to soak overnight in 1 pint water. Shred the rinds finely and weigh them, allowing 2 pints water to each lb. fruit. Let the rinds soak in this water overnight. Boil up next day, adding the water in which the pips were soaked, and continue boiling until the rinds are tender. Let the preparation stand for another day, then weigh the rinds and allow 1 lb. preserving sugar to each lb. fruit. Boil up until it reaches the jelly stage. This should take about ½ hour.

Grape Fruit Marmalade. Wipe the fruit, remove rinds and slice thinly. Remove the white inner tissue, pith and seeds. Cut the fruit in slices. Weigh the pulp, and allow pound for pound of sugar. Put pulp and rind in a preserving pan, just cover with water and boil till rinds are tender. If the marmalade seems too bitter, the water should be changed once. When rind is soft, add the sugar, and simmer until the marmalade sets when tested on a plate.

Melon Marmalade. Canteloupe, citron, or musk melons may be used for marmalade. Quarter the melons, but do not peel them.

Take out the seeds, weigh the fruit and allow a pound of sugar to every pound. Grate the melons on a suet grater, discarding the rinds. To every three pounds of pulp allow the grated rinds of two lemons and a teaspoonful of ground ginger. Put all (including sugar) into a preserving pan, and let it boil gently until it thickens and sets well. Stir steadily from time to time to make it smooth, and remove scum as it rises. When it is done pour into pots and cover while hot.

Ginger and Marrow. An excellent butterscotch marmalade of the same type as the one described is made by allowing

1 lb. sugar to each lb. vegetable marrow. To 6 lb. marrow should be added 6 lb. sugar, 6 lemons, 6 oz. green ginger, 2 oz. root ginger, and ½ teaspoonful cayenne. The marrow is pared, pips removed, and cut into square pieces of roughly 1 in. Peel lemons, shred the rinds, cut up the root ginger, and put the juice, shreds and marrow into a large pan with the ginger and sugar. Let them stand until the juice covers them. This takes about 24 hours. Boil until the marrow is quite transparent. No water is added.

Pineapple Marmalade. Remove the peel and eyes from the pineapple, pass the fruit through the mincer, weigh and allow ½ lb. sugar to every lb. fruit. Mix the sugar and fruit well and leave in a bowl overnight. Next day put into a preserving pan and simmer gently for an hour or until it sets. The large quantity of juice in pineapple makes it unnecessary to add water. Pour the marmalade off into warm jars and tie down while hot.

Quince Marmalade. Quince marmalade is prepared by peeling and quartering the fruit, removing the cores, and then putting the latter, together with the peelings, into a pan containing just enough cold water to cover them. Boil them over a slow fire until their flavour has been well extracted. Then strain the liquid through a fine sieve and let it cool. After weighing the quinces, put them into a pan, pour the strained liquid over them, and then cook them until they are a pulp, pounding them with a spoon if necessary. For every pound of fruit add ½ lb. preserving sugar, stirring carefully until the latter has dissolved. Boil up the marmalade and continue boiling until it sets, when it may be potted.

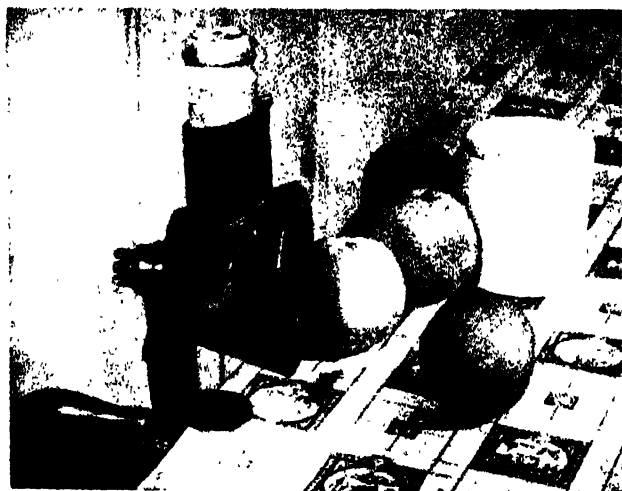
MARMALADE PUDDING. To make a bodied marmalade pudding, chop finely 5 oz. suet and put it into a basin with 5 oz. fine breadcrumbs, 2 oz. flour, the grated rind of a lemon, 3 oz. brown sugar, and a pinch of salt. Into a small basin put 5 oz. orange marmalade, a tablespoonful of golden syrup which has been warmed, and 2 eggs. Beat all well together, then add nearly 1 gill milk. Mix the dry ingredients, make a well in the centre, and work in the eggs and marmalade. It must then be turned into a well greased pudding-basin or mould and steamed for 2½ hours. It should be served with marmalade sauce.

MARMALADE SAUCE. Mix a small dessertspoonful of arrowroot into a thin paste with cold water, then add ½ pint boiling water, stirring it into the arrowroot by degrees. Turn all into a saucepan, and boil for 2 or 3 min., add the juice of ½ a lemon, 1 dessertspoonful white sugar, and 2 tablespoonfuls marmalade. Simmer for 2 min. before serving, but stir all the time.

MARMOT. A somewhat harsh fur, marmot is usually of a greyish black colour in the ground, becoming lighter and more yellowish-red at the top. The hair is reddish, stiff, and often speckled with black. It is usually dyed to imitate the more costly mink, and in this form is used for making wraps and coats.

MAROCAIN. A soft lustrous material of silk or mixture of silk and wool, or of all wool, marocain can be obtained in various qualities. This material, being heavier than crêpe de Chine, drapes well for dresses, and is also used for light weight wraps and coats. It is obtainable in plain colours or patterned.

MARQUEE. A large tent or marquee is constructed with two upright poles with the canvas formed in a ridge between them. It is generally oval in shape, or rounded at the ends with straight sides. A marquee is often erected on a lawn for refreshment service accommodation and for sheltering the guests at social functions or during sports. See Tent.



Marmalade Machine. Type requiring the fruit to be inserted from the top. There is also an attachment at the side for cutting French or runner beans.

MARQUETRY AND ITS PROCESSES

A Decorative Handicraft Explained and Illustrated

In addition to Veneer, readers are referred to the entries on the various woods used, e.g. Ebony, Satinwood, and to the articles that can be decorated with marquetry, such as Cabinet, Grandfather Clock, Knife Box, Screen. See also Louis Style.

Marquetry is a form of inlaying in which the effect is obtained by the use of veneers applied to a groundwork. The inlays and the background are cut at once, the process affording scope for many artistic and elaborate effects.

In Italy marquetry was used to decorate caskets during the 15th century. Ivory and natural woods were employed. The form known as intarsia was first executed there in the 16th century. Geometrical designs were used, but later floral and pictorial decoration was applied in this manner. By the end of the 17th century marquetry was lavishly employed on Continental furniture, and by the 18th the great English designers, with the exception of Chippendale, used it freely to decorate cabinets, bureaux and smaller pieces. The secretaire shown in the first illustration gives an idea of the delicate and beautiful design and workmanship of the best French marquetry in the 18th century.

Modern English marquetry work in the form of panels chiefly used for decorating sideboards, cabinets, screens, and mirrors, shows fine design and craftsmanship. The floral panel of the fire screen illustrated is beautifully executed in a delicate contrasting colours, and the panel which decorates the sectional mirror is suggestive of the charming work that can be carried out in a simpler design.

Fig. 1 illustrates the principle of marquetry work. Two sheets of veneer of different wood or colour are fastened together and a saw cut

made through the two, as in Fig. 1 A. They are then separated and the pieces interchanged, as in Fig. 1 B, thus obtaining the required inlay. The remaining parts (Fig. 1 C) would form another inlay though it is seldom possible to use them for the same job as the background usually has to match the wood of which the piece is made. In commercial work the cutting is done with a power or treadle saw, but an ordinary fretsaw frame with a very fine blade will serve the purpose quite well.

Fig. 2 shows the type of donkey used by the trade when the marquetry is still cut by hand, and is quite a simple structure to make. The worker sits astride the form and places the work between the two thicknesses of wood at the head. A firm grip is obtained by placing the foot on the treadle, which being connected to the outer thickness of wood by a rope, draws it inward toward the other. The advantage of the donkey is that the work is easily removed or altered to another position, leaving both hands free, and is fixed at an easy height.

A similar type is shown in Fig. 3, and is fixed in an ordinary bench vice, the two thicknesses being gripped with a thumb screw. The front and main thickness should be of 1 in. stuff and the back $\frac{1}{2}$ in.

The wide range of material for inlaying is not confined to wood. Tortoiseshell, ivory, brass, and other metals have all been used, besides stained wood. The direction of the grain in the inlay plays a great part. Where the inlay occupies a small space in a large panel, it is only necessary to put a small portion of veneer sufficient for the inlay in the required position, but in a panel such as is seen in Fig. 4, where the inlays are distributed fairly evenly over the whole panel, the inlay

A background veneers should be of the same size. In this case two different woods are used for the inlays, so that three thicknesses of veneer will be used. If two panels are required six thicknesses are cut, two of each kind of wood. The cross-banded edge and the inlaid line would not be cut in the marquetry, but would be applied after it had been laid.

Either knife or saw cut veneers may be used, though if only a few thicknesses are to be cut it is advisable to use saw-cut, being thicker, it is not so liable to split during the cutting process. If knife cut is used, even though only one panel is required, it is generally a better plan to cut an extra panel and so get extra thickness to cut, as the firmer the substance the easier the cutting will be. All the veneers for a single panel must be either knife or saw cut, as it is impossible successfully to lay marquetry out from veneers of different thicknesses.

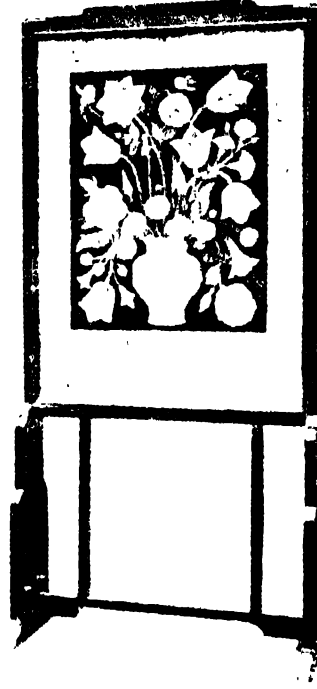
A Simple Pattern. Fig. 5 is an example of marquetry using only two woods, oak and ebony, the right-hand side showing the

finished panel with oak background and the left vice versa. As the design fairly covers the whole background, both sheets of veneer will be of the same size. First prepare a careful drawing of the design on paper, with the woods to be used marked (though where only one inlay is used this is hardly necessary), and make a tracing of it.

Prepare the two sheets of veneer and glue them together with thin glue, and with a sheet of paper between, so that they can be separated later. If two panels are to be cut, place the oak and ebony sheets alternately, and when they are cut and separated, interchange the adjacent sheets. It is of vital importance that the thicknesses should be as close together

as possible, otherwise they will be apt to split during cutting. When gluing they should be placed between two flat boards and cramped together. Paper should be put between the veneer and the boards, to prevent them from sticking one to the other.

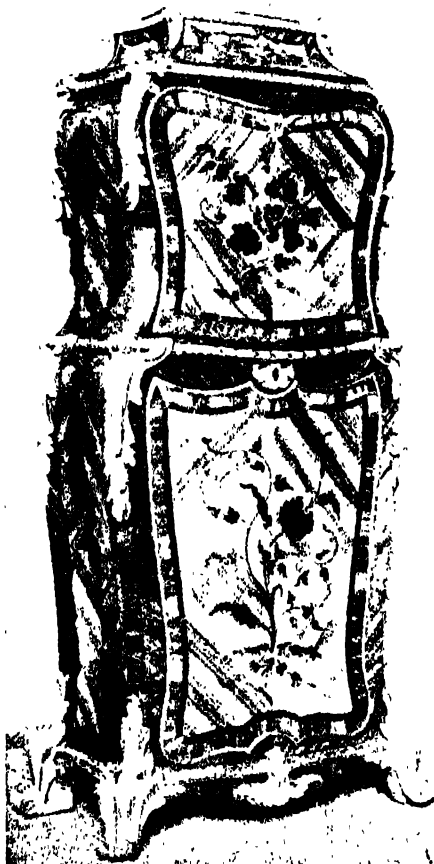
When dry, paste the tracing on one side, and, fastening the work in the vice, cut round the design carefully right on the line with a very fine fretsaw. It is necessary to bore holes in which to start the saw, and these should be as fine as possible and in such a position as not to be noticeable, this is usually where two curves meet. The saw must be held quite square to the work, so that the parts will interchange perfectly, and should be proceeded with in such a way that the panel is not unduly weakened. Do not cut away the entire portion first, as



Marquetry. Above, fire screen in modern marquetry, the panel being in woods of contrasting colours. Below, mirror with pictorial panel in marquetry. Courtesy of A. J. Rowley, Kensington.

this would render the veneer liable to split, especially when afterwards cutting the outer shape across the grain at the top and bottom. When any part is cut completely out, like the small pieces in each corner and the centre, mark on it the part from which it was cut and its position, so that it can be replaced afterwards.

Having cut the complete design, the next step is to separate the thicknesses. This is done by easing the parts away with the thin blade of a knife, so that the paper splits. If any difficulty is found from the glue having been too thick it is advisable to weaken it by



Marquetry. Secretaire in marquetry with inlay of flowers, marble top, ormolu mounts. The upper part has a falling front enclosing two drawers, the lower is a cupboard. French; period of Louis XV. By permission of the Director, Victoria & Albert Museum, South Kensington.

placing the veneers between two sheets of damp blotting paper and laying a weight on top. The moisture will then percolate through the wood, when the pieces may be separated easily. The various portions of the adjacent sheets are interchanged and the whole glued on to a sheet of paper, using thin glue. Apply the glue sparingly, or the veneers may buckle. See that the various parts lie together flat; it may be necessary to put them under a weighted board for this purpose, though gluing down on to the paper is usually sufficient. When the veneer may be laid on to the ground-

Using Two Inlays. Fig. 6 is another example of marquetry, embodying the use of two inlays (satinwood and a green stained wood) on a mahogany background. In this case the inlays occupy a relatively small space in the panel; the flower and the base only being in satinwood and the stalk and leaves in green wood, so that it will be necessary only to cut pieces sufficiently large to cover the local inlays. The dotted lines show the position in which these are placed, the green piece being put on the mahogany background first and the two pieces of satinwood on the green wood afterwards. The tracing is pasted to the flat mahogany side, care being taken to see that the various parts of the design come opposite to their corresponding veneers. The cutting is then proceeded with in the usual way.

The lines forming the divisions to the petals in the flower are formed by saw cuts. As the whole of the flower is intended to be in satinwood only, it is advisable not to let the division lines run quite down to the juncture with the stalk, so that the flower will remain in one piece, thus saving the unnecessary labour of putting them together again. The lines are shown running right through in the sketch, since it might be desired as an alternative to form the flower with petals of alternate satin and green wood, instead of all satin, in which case the cuts will run right through.

The necessity for good workmanship in marquetry is seen when cutting small panels. The practised fretworker will find little difficulty in cutting out the shapes, but the beginner should have some preliminary practice in making even saw cuts before attempting any elaborate work. It is a good plan to glue odd pieces of thin fretwood of contrasting colours together with a sheet of paper between them. A suitable but simple design should be drawn on one piece, and then cut out.

The use of colour in marquetry is a valuable help in working out suitable designs. White woods, especially sycamore, can be stained by aniline dyes to almost any required shade, and brightly stained woods contrasted with dark woods will give some fine effects.

The groundwork must be of a suitable wood to hold the glue well, free from knots, and able to stand well without shrinking or twisting. It must be prepared perfectly true and flat, and must be toothed. Honduras mahogany is the ideal wood to use for a ground, though

yellow pine is also good. This latter should be given a coating of size after toothed to fill in the grain, and left to dry, as otherwise when the marquetry is applied the pine would soak up more than its fair share of the glue and leave the marquetry liable to peel off.

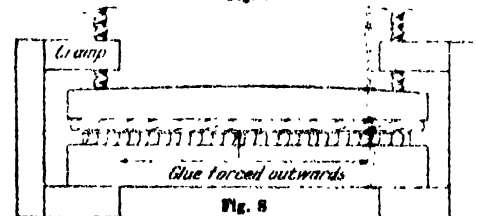
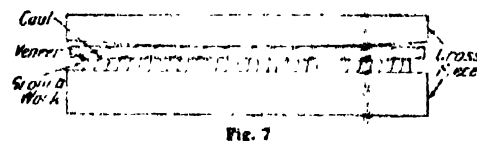
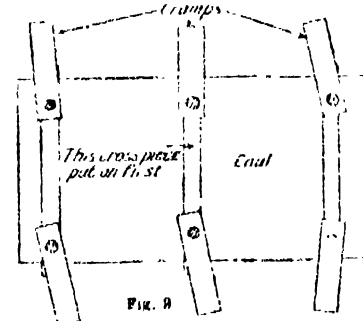
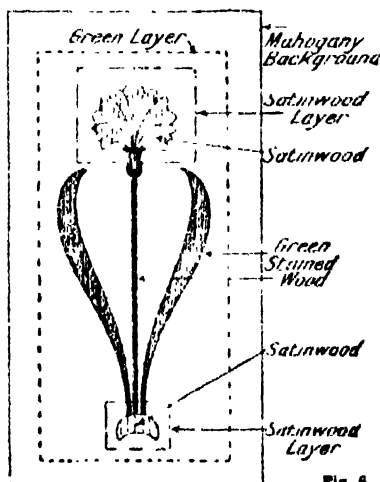
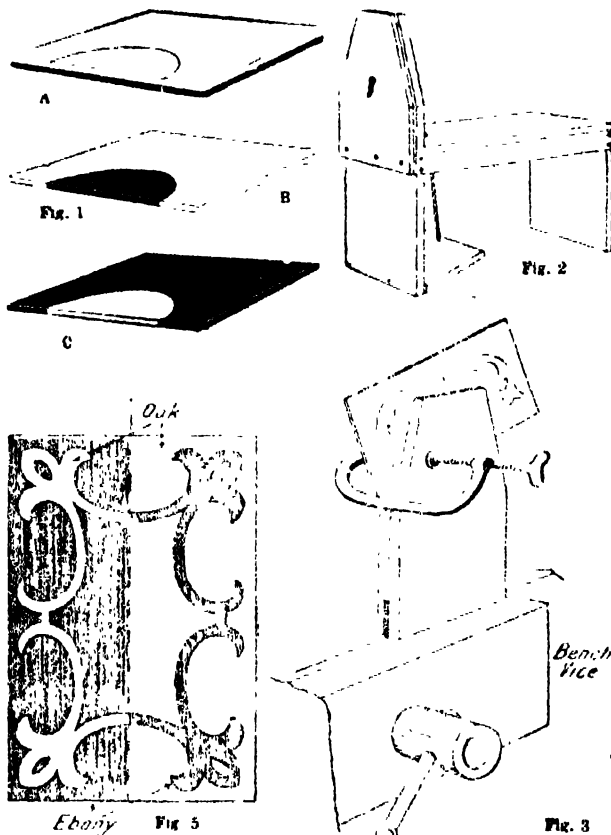
Laying the Marquetry. It is not possible to lay marquetry with a hammer, as is done with some kinds of plain veneer, so what is termed the caul method is used. Figs. 7, 8, and 9

give an idea of the kind of apparatus which is wanted. The caul is a piece of wood slightly larger than the ground and about 1 in. thick, and quite flat; this is to lay on the veneer and press it equally all over. The crosspieces are slightly longer than the width of the ground, those for the bottom being square. The top pieces are straight on the top edge but are curved slightly on the underside (Fig. 7), so that when pressure is applied to the ends the glue will be forced from the centre outward (Fig. 8). The shaping is rather exaggerated in the diagram, but about 1 in. will be sufficient in a length of 2 ft. The lower crosspieces must be wider than the top ones, so that the pressure bends the top pieces straight. Two cramps or handcrews are required to each crosspiece.

The ground being ready, mark centre lines in the length and breadth of both the marquetry and the ground; this will give the exact position for it to be fixed. The lines should be marked on the paper covered side of the marquetry. Glue both the ground and the marquetry, place the latter in position and drive in two line veneer pins to fix it temporarily. The marquetry should be paper side upward, so that the glue grips the wood. Now lay a sheet of paper over the whole.

Heat the caul thoroughly on one side, place it on the paper and apply the centre crosspiece, tightening each cramp a little at a time so that pressure is applied gradually from the centre outward. Fix on the other crosspieces and give all the cramps an extra screw, and leave it to set. The whole process of applying the caul should be gone through as quickly as possible, because if the glue once chills it will be impossible to squeeze it out, and a repetition of the process will be required.

Cleaning Up. To clean up the work when set, a steel scraper is used, and care must be taken to work thus so that it does not mar the grain up, especially where the grain of an inlay runs counter to that of the background. The job is finished off with fine glasspaper, and the two pins used temporarily to secure the veneer should be removed before cleaning.



Marquetry. Fig. 1. Three stages showing principle of the work. Fig. 2. Donkey with treads. Fig. 3. Donkey which can be fixed in an ordinary bench vice. Fig. 4. Panel with evenly distributed inlay. Fig. 5. Example showing use of two woods only. Fig. 6. Two inlays, satinwood and green stained wood, in a mahogany background. Fig. 7. Laying marquetry by caul method; top cross piece curved on underside. Fig. 8. Pressure applied, forcing glue outward. Fig. 9. Plan of apparatus used in this process.

MARRIAGE IN ITS LEGAL ASPECT

The Responsibilities of Husband and Wife Outlined

For the ceremony of marriage our readers are referred to the articles *Wedding* and *Its subsidiary entries*, e.g. *Bride*; *Trouseau*. See also *Divorce*. Husband

Marriage was defined according to the law of England to mean the union for life of one man and one woman to the exclusion of all others, or the union of two people who promised to go through life alone with one another. Consequently English law does not recognize polygamous marriages. In order that a marriage may be legal the following requisites must be complied with:

Husband and wife must be of marriageable age, i.e. 16 years of age or over, and of such a mental condition as enables both of them to know and appreciate the fact of the marriage. If it can be proved that one of the parties to a marriage ceremony was incapable of knowing or appreciating what he or she was doing the ceremony is null and void.

The parties must consent to the marriage, and this involves the proposition that each of them knows what the ceremony means. Instances have occurred where both boys and girls have been entrapped into marriage being told it was something else, particularly in out-of-the-way colonies and other countries where people can go before a magistrate or other person and by signing a paper are declared to be married. Any such marriages can be nullified.

There must be no legal impediment. A table containing the list of marriages prohibited will be found in the *Prayer Book*. To-day a man may, however, marry (1) his deceased wife's sister; (2) his deceased brother's widow; (3) his deceased wife's brother's (or sister's) daughter; (4) the widow of the brother of his father or mother; (5) his deceased wife's father's (or mother's) sister; (6) the widow of the son of his brother or sister. A marriage according to Church of England rites may be by special licence from the Archbishop of Canterbury, by common licence from a bishop or his surrogate, after banns, or after notice to a registrar.

The Archbishop of Canterbury's licences can be given entirely at his Grace's discretion, and can authorise the marriage in any place and at any hour, in a church or chapel in which banns might have been lawfully published.

Application for a special licence is made to the Faculty Office, and the reason why it is required must meet with the archbishop's approval. The fee for the licence is £25.

Publishing the Banns. Where the parties live in different parishes the incumbent of one parish shall not solemnize a marriage by common licence without a certificate from the incumbent of the other parish that the banns have been called there also. The parties must be married within three months after publication of banns, which are to be published in an audible manner during three succeeding morning services, or, if there is no morning service, during the evening service, and it must be on a Sunday. People who do not desire banns to be called can be married according to the rites of the Church of England after having given notice to the superintendent registrar, who publishes the notice in the proper manner for at least three weeks. In all marriages in the Church of England the ceremony must be performed by a clerk in holy orders. It is doubtful whether a deacon can perform the ceremony, though it has once been decided that he may.

Marriages may be solemnized according to the rites of other religious bodies in certain registered buildings and by registered persons, or in the presence of the civil registrar. A marriage in a register office can take place before the superintendent registrar of the

district. This official is not allowed to perform a religious ceremony.

The Marriage Licence. In England and Wales marriage licences are of two kinds: those issued by the officials of the Church of England and Wales for marriage in a building belonging to that form of faith, and those issued by a registrar for marriage in a church or chapel belonging to Nonconformists and registered for marriages, or for marriage in a district register office.

As regards the Church of England marriage licences can be obtained in London by application at the faculty office at the vicar-general's office, and at the bishop of London's registry, by one of the parties about to be married. Elsewhere they may be obtained at the offices of the bishops' registrars, but licences obtained at a diocesan registry only enable the parties to be married in the diocese in which they are issued. Those procured at the faculty office, 23, Knight-riding Street, Doctors' Commons, London E.C.4, are available for London and all England and Wales; those procured at the vicar-general's office, 1, The Sanctuary, Westminster, London S.W.1, are available for London and all England and Wales except the province of York.

No instructions, either verbal or in writing, can be received except from one of the parties. Affidavits are prepared from the personal instructions of one of the parties about to be married, and the licence is delivered to the party upon payment of fees amounting to 30s. in addition to the cost of stamp 10s. No previous notice is required, and the licence is available as soon as it is issued. The cost of licences in the country varies, according to the diocese, from £1 15s. to £2 12s. 6d.

To secure a licence for a marriage in a Nonconformist place of worship or a register office, notice must be given personally to the superintendent registrar of births, deaths, and marriages, or the deputy of such officer. One notice only is necessary, whether the parties live in the same or in different registration districts, and either party may give the notice. If both live in the same district, one of them must have lived there for 15 days before notice can be given.

If the parties are living in different districts, and both have fulfilled the necessary residential qualification, notice may be given in either district. If one only had fulfilled the qualification, the notice must be given in the district in which the residence has been fulfilled, and the other party must be resident in England or Wales when the notice is given. The office contains particulars as to names, ages, residence, length of residence, and the building in which the marriage is to take place.

After the lapse of one weekday, not Christmas Day or Good Friday, from the date of the entry of the notice, the superintendent registrar may, provided no impediment is shown, issue his certificate and licence for the marriage which can then take place on any day within three months from the date of the entry of the notice. For a marriage by licence of this kind the total fees are £2 10s. 6d. There are special provisions where one party is resident in England and the other is resident in Scotland or at some place in the commonwealth outside England.

Consent of Parents. The consent of parents is only necessary where one of the parties is under the age of 21. If, however, a young person under age makes a runaway match and marries without the parents' consent, and even in spite of the parents' prohibition, the marriage is lawful. Any minister or registrar, however,

who marries an infant after having been prohibited to do so by the parents or guardians and also the infant himself is liable to severe penalties.

Marriages with Foreigners. In the case of marriage with a man who is a foreigner an Englishwoman may find herself awkwardly situated unless she takes care to find out how far he is at liberty to marry her, and whether or not any consents are required according to the law of his domicile. For instance, some foreign laws are very strict, and even though a man may be an adult require that before he can be lawfully married he shall obtain the consent of his parents.

An Englishwoman who marries in this country a person domiciled abroad who has not obtained the proper consents is recognized as married by the English courts, but abroad her marriage is not valid. It is wise, therefore, for an Englishwoman who intends to marry a foreigner in England to make previous inquiries at the office of the consul for that country, so as to ascertain whether or not it is essential to procure anybody's consent.

Under the *Marriage With Foreigners Act, 1906*, arrangements may be made with foreign states for the issue by the proper officer of those states of a certificate that due notices have been given. The foreigner may be required to give notice to the persons by or in whose presence the marriage is to be solemnized of the fact that he is subject to the marriage law of the country. He must get his government to offend to issue a certificate that the notice required has been given, and that no impediment exists or that proper consents have been given. British women marrying foreigners should also appreciate that the marriage laws of their husband's country may not recognize divorce. British women who married foreigners during and after the Second Great War may in many cases be divorced or obtain a divorce in the U.K.

Valid and Invalid Unions. In England it is an offence punishable by fine and imprisonment to give wilfully a false name on being married but the marriage is not rendered void. A marriage is apparently void where it is celebrated according to the rites of the Church of England after publication of banns of false names are given and both parties know that the names that have been given are false.

An Anglican marriage is void unless it is celebrated by a person in holy orders. It is also void if not celebrated in a lawful place, i.e. a church or chapel of the Church of England, a registered place of worship of any other denomination, a place authorized by the archbishop by a special licence, or a register office. As to marriages which take place abroad, the foreign law applies, save that the marriage must be of such a kind that it comes within the English definition of marriage, i.e. it must not be a polygamous union.

Sometimes foreigners living in England attempt to celebrate marriages in places of their own which are not registered for the purpose. Such alleged marriages are void according to English law except, it may be, where both parties are subjects of a foreign state and they go through the ceremony of marriage within the precincts of the embassy of that particular state.

Another point to be noticed is that, although as to the form of a marriage celebrated abroad the courts in England will recognize that form, they will not recognize the validity of a marriage between English people who could not have married in Great Britain. Thus, before the passing of the *Deceased Wife's Sister Act*, the English courts did not recognize a marriage abroad between an Englishman and his deceased wife's sister.

Marriage at sea on a British ship is a marriage in Britain and can be celebrated by an

episcopally ordained clergyman or minister. There is authority for saying that a marriage celebrated by a ship's master is not valid.

The law as to what constitutes a valid marriage between British subjects abroad is not altogether clear. A marriage celebrated anywhere according to the law of that country in the presence of an Anglican, Roman Catholic, or Greek clergyman is valid, but cases arise where no clergyman can be found, as, for example, in remote parts of India or Australia. It has been held in some cases that where the parties intending to go through a ceremony of marriage bound themselves by words representing the fact that they are taking each other in marriage, the marriage is lawful. On the other hand, it has been held that where two people went to the British consulate in Smyrna and were married without the presence of a clergyman it was void.

A marriage solemnised abroad by a naval, military or air force chaplain or by a person authorised by the officer commanding the forces in that area is valid provided one at least of the parties is a member of the forces serving in the area or is employed there in some specified capacity. These provisions do not apply normally to territory that is part of His Majesty's dominions.

The Medical Side. A medical man is rarely consulted by persons about to marry, and in the vast majority of cases there is no need for medical advice; but, on the other hand, there are many cases where marriage should be delayed, and more than a few where it ought to be avoided altogether.

A very early marriage is usually undesirable, though there are exceptions to this rule, because the development of the body does not always correspond with age. So far as the wife is concerned a late marriage has also its risks. From the age of 30 to 35 onward the pelvis (or bony cavity at the lower part of the body) grows more solid and rigid. When a child is born, the bone-enclosed outlet through which it passes does not yield so readily as it does in a younger woman, and hence labour may be slow and painful. Apart from rickets or other disease, this is not the case in a woman who marries earlier in life, has her first child before she is 30, and continues to bear children thereafter.

Probably the best time for a woman to marry is between the ages of 23 and 27. But in most cases there is no reason why she should not marry a year or two earlier or three or four years later. A woman with very narrow hips would, therefore, do well to consult a doctor before marrying, or at any rate some time before the birth of her first child is due. Sometimes the pelvis is not alone small, but misshapen, perhaps as a consequence of rickets. This, again, is a case for medical advice. Whether such a woman should marry at all is a question that will depend on the nature of the deformity.

There are certain diseases which should prevent the marriage of prudent people. Thus, serious heart disease (either in a man or a woman), Bright's disease, consumption, epilepsy, or any mental affection, makes marriage very undesirable. It is often a difficult question to answer whether an apparently normal-minded person in whose family insanity has appeared should marry. A good deal depends on the cause and type of the insanity, but medical advice should always be sought.

A woman should never marry a man who is a confirmed drunkard. Very many women make the great mistake of believing that they can reform such a man. If a man habitually drinks to excess before marriage, he will almost inevitably continue his bad habit after it. And not only will the wife suffer, but the children may possibly turn to drink, or suffer from some nervous disease.

As to the marriage of cousins, it may be said that in the children of such parents any peculiarity of constitution common to both father and mother is very likely to be intensified. Cousins may, therefore, marry with safety if both are healthy and if there is no such disease as epilepsy, insanity, pronounced hysteria, etc., in their families. The danger of cousin marriages is that both may have the same kind of constitution, and, if any family disease exists, both may combine to transmit a tendency to the development of this disease in an intensified form to their children.

It was said above that both very early and late marriages are inadvisable. The same applies to the marriage of a young woman to an elderly man, or vice versa. Precisely what disparity of age is allowable it is impossible to say. Many young women can be happy with husbands considerably older than themselves, while to others life will be a continuous round of discontent. As a general rule, it is best that the wife should not be much older than the husband, and that the husband should not be more than 10 or at the most 15 years older than the wife.

The Marriage Settlement. When people of means are about to marry, it is usual for them to set aside a certain amount of property to make provision both for themselves and for the offspring of the marriage. This specially applies to people with landed property which has been in a family for some time.

The form of such settlements is as follows. Two or more trustees are appointed, one by the intended wife and one by the intended husband. A deed is drawn up to which the intended husband and wife and the trustees are parties. The intended husband conveys to the trustees or transfers to them whatever property he intends to put in settlement, and the intended wife does the like. The deed directs the trustees to hold this property, until the marriage has been celebrated, for the intended husband and wife respectively, and, after the marriage, to pay the income as directed.

A Typical Example. Where the major part of the property is settled by the husband, it is usual for the income of it to be paid to him during his life, and, after his death, should he die before the wife, to pay part of the income to the wife. As to the capital, the husband is generally given a power to appoint it amongst the children of the marriage in such proportions as he thinks fit, and if he does not do so, then his wife may, if she survives him, and if neither of them does so, then the children of the marriage are to take equally. The wife's property is settled on her in the same way, herself for life, then her husband for life, and then the children as appointed.

The above describes an ordinary settlement of stocks, shares, and other invested money. In the case of land, however, it is different. The family estate is settled to be held by the trustees in trust for the husband for life, with an allowance to the wife; and, after the husband's death, a certain income or portion is to be paid to the wife, a certain sum is to be paid to younger sons and to daughters when they attain the age of 21 or marry, and the land is to be held by the trustees in trust for the eldest son of the marriage in tail. This deed is called a family settlement.

A genuine marriage settlement, i.e. one made before and in contemplation of marriage, is a contract and conveyance for valuable consideration, because marriage is the most valuable of all considerations. Consequently, it cannot be attacked as fraudulent, i.e. as putting property out of the reach of creditors, unless the marriage itself was part of a scheme to defeat creditors.

If the husband who has made the marriage settlement should go bankrupt, his trustee in

bankruptcy can seize for the creditors his life interest in the settled lands or funds, but he cannot seize the land itself or upset the settlement on the ground that when the husband made it he was heavily in debt. To this rule there is an exception. If a man and a woman get married on purpose so that the man can make a settlement of his property on the woman so as to put it out of their creditors' reach, the settlement can be upset as a fraudulent conveyance. But this can only happen if both the man and the woman were parties to the fraud.

The person who is to receive the rents and profits of the land through the trustees for his life is called the tenant for life, and has very extensive powers of management of the estate. Put briefly, he has power to deal with the estate almost as if he were the absolute owner of it. He can grant leases of the property, he can sell it, all except the principal manor house and any heirlooms, and even these he can sell by leave of the Court; but any capital moneys received must always be paid over to the trustees, who will invest them and only pay the income derived from them to the tenant for life.

MARRIAGE: The Card Game. This card game is suitable for two players. It is played with the piquet pack of 32 cards, i.e. all from the seven upwards, and is won by a game of 60 points. The values of the cards are as follows: The ace counts 11 points, the 6 and 10 points, the king 4 points, the queen 3, and the knave 2, the other three have no scoring value. Trumps are played in this game.

As in piquet and similar games, coming is from cards in hand and from cards played. The scores for cards in hand are, for a marriage, i.e. king and queen of an ordinary suit, 20 points; and for a love, i.e. ace and ten of an ordinary suit, 30 points. For marriage and love in the trump suit these scores are doubled, i.e. 40 points and 60 points. In the outplay the counting cards played and taken give the score. Sixteen points are added for the first trick taken, and 20 points if the last six tricks have been won by one hand alone.

The players cut for deal and the lower cut deals. He gives 6 cards to each player and turns up the 13th card to show the trump suit. The remaining cards form a stock from which the players draw. The play begins by the non-dealer leading. The dealer can then, if he so wishes, play a card of another suit, as he need neither follow suit nor trump. These two cards form a trick, and the winner of this trick leads in the following one.

The winner of a trick can now declare any marriage or love he may hold; if it is good it is scored at once. Each love and marriage must always be shown before scoring for them, and one card of the proved love or marriage cannot be played at once. The winner of the trick next draws the top card from the stock and the loser draws the one below it. This occurs after every trick until the stock is exhausted, so that during the earlier part of the outplay each player has six cards in hand.

Marriages and loves can be made whenever convenient, but only by the winner of the trick immediately preceding. A declaration cannot be made after the stock is closed, nor after the first card of the eleventh trick is played. That is to say, during the last six tricks no declarations are valid. With equal loves or marriages the non-dealer or elder hand scores on declaration; the other player does not.

A player holding the seven of trumps may exchange it for the turned-up card when it is his turn to draw, and as long as the stock remains unclosed or unexhausted. When a seven or the last card from the stock is drawn, it cannot be exchanged. After drawing either player may declare the stock closed, and after that no player can draw a card from it. The one who closes it must thus win the game in

the outplay by completing 66 points; if he fails to do so his opponent becomes the winner, even if he has not reached 66 points and has a score lower than that of the closer.

MARRON GLACÉ. This sweetmeat consists of chestnuts preserved in sugar. To make them, procure some large chestnuts and remove the shells. Boil the chestnuts, putting them into boiling water, for about 15 min.

Drain them and remove the skins. Boil up again and continue to boil until the nuts are tender, but do not break them. Put them aside to cool, and make a syrup of 1 lb sugar to $\frac{1}{2}$ pint water and boil to the temperature of 200° F. Take up the chestnuts with a pair of sweetmeat tongs and plunge them in the syrup, one at a time. Place the chestnuts on an oiled slab to dry, not touching one another.

MARROW IN GARDEN AND KITCHEN

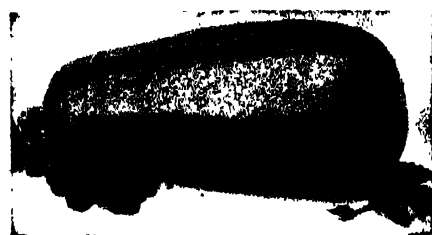
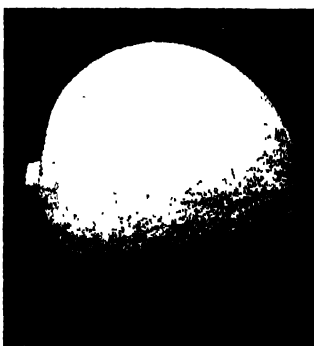
Its Cultivation and Some Attractive Recipes

After describing the growing of the marrow, our article goes on to deal with various ways of cooking it. See also the article on Ma malade. For further information see Frame, Greenhouse, Hotbed, Kitchen Garden, Manure, Pumpkin.

The vegetable marrow, although regarded as a vegetable in cookery, is a fruit, like the tomato and the cucumber. It is a half-hardy annual trailing plant, with edible fruit.

There are numerous varieties of the vegetable marrow. Of those with large fruits Long Green and Long White are favourites. Moore's Cream, Penny hyd, Rothschild Orange, and Table Dainty are excellent small marrows. The bush and custard marrows are less vigorous in growth than the trailing varieties.

How to Cultivate. To grow good early marrows, the seeds should be sown under glass early in April in pots of light soil, in a greenhouse in which a temperature of 55° to 56° may be safely maintained. As soon as the plants are large enough to handle, they should be shifted into 6 in. pots. Before being planted out of doors in May they should be hardened off. Marrows may be grown on turf heaps, even on a heap of garden rubbish, or on the



Marrow. Well-grown specimen of a green marrow. Top, right, a round marrow.

ground level in manured soil. Three or four successive plantings may be made at intervals of a fortnight until the end of June, or seeds can be sown out of doors in May.

As soon as the leading shoots reach a length of 18 in. to 2 ft. they should be pinched out, and care should be taken that the runners are trained evenly over the ground.

Fertilization should be carried out when the first of the female blooms make their appearance. This is done by stripping male flowers of their petals and applying the pollen to the centre of the female flowers.

If the marrows are wanted for preserving, they should be cut before they are ripe, and hung up in a dry room & the bases of their stems. Marrows should always be cut before they are fully ripe, for they are then of superior flavour. The young shoots of marrow plants, when thinning is desirable, form an excellent substitute for spinach.

How to Cook. When prepared as a vegetable for table the marrow should be cut in halves or quartered, pared, and the seeds and pulp removed; but if intended for a made dish it is sometimes boiled whole, and after it is cold it is pared and sliced, as it remains firmer when treated in this manner. To

serve vegetable marrow plain: Prepare it, put in boiling salted water to cover it, and boil from 20-25 min. Serve on pieces of toast with melted butter sauce poured over or handed round in a sauce boat.

Marrows can also be baked. Prepare a good-sized marrow and cut it in two lengthwise, remove the seeds and parboil it for about 10 min. It should now be stuffed with a good veal forcemeat, floured and the two halves fastened together round the stuffing with white tape. Bake in a moderate oven about 20 min., basting it with plenty of good dripping and letting the marrow brown at the last. Just before it is done strew brown crumbs over the top and baste them well. Serve with a good thick brown gravy poured round the base. Minced meat or ham may be added to the forcemeat.

Marrow can be added to fruit in pies and puddings or mixed with various ingredients and made into sweet dishes. In addition,

marrows also make excellent preserve.

Cold cooked or parboiled marrow can be fried in butter or bacon fat and makes a good breakfast dish served with bacon.

Marrow au Gratin. Marrow au gratin is prepared by peeling a marrow, splitting it into four, then removing the seeds and washing it. Put it into a saucepan of boiling water to which a little salt and soda have been added, and boil it gently for about 15 min., or until it is tender. Mix $1\frac{1}{2}$ oz. flour to a smooth paste with $\frac{1}{2}$ gill cold water, and put 2½ gills milk to heat

in a pan with $1\frac{1}{2}$ oz. butter, and pepper and salt to taste. When the latter are hot, pour on the flour and water, bring the whole to the boil, and the simmer it for 6 min., keeping it well stirred in the meantime. Add 1 oz. grated cheese, pile the marrow on a slice of toast placed in a gratin dish and pour the sauce over it. Sprinkle another ounce of grated cheese on top, then put the whole under the grill and brown it slightly.

Steamed Marrow.

Steamed marrow is served on toast and covered with egg sauce. Put the prepared pieces in a

steamer, add salt to taste, and cook them over boiling water until they are tender. Serve with the sieved yolk of a hard-boiled egg sprinkled over the top of the egg sauce.

Marrow Pickle. To pickle marrow chop 8 lb into small chunks, lay them on a dish and sprinkle them with salt. Leave them thus for 12 hours, then put them into 3 quarts vinegar with a few cloves and peppercorns and 2 oz. root ginger, and boil all for 15 min. Next, mix together thoroughly 2 tablespoonfuls mustard, 1 oz. turmeric, a small piece of chopped cauliflower and 2 or 3 small chopped onions, a teaspoonful of sugar, and 1 quart vinegar. Pour these over the marrow, etc., bring all to boiling point, and add salt to taste. The pickle can be bottled when it is cold.

Marrow Pie. Equal quantities of marrow and apple are required for this pie. The

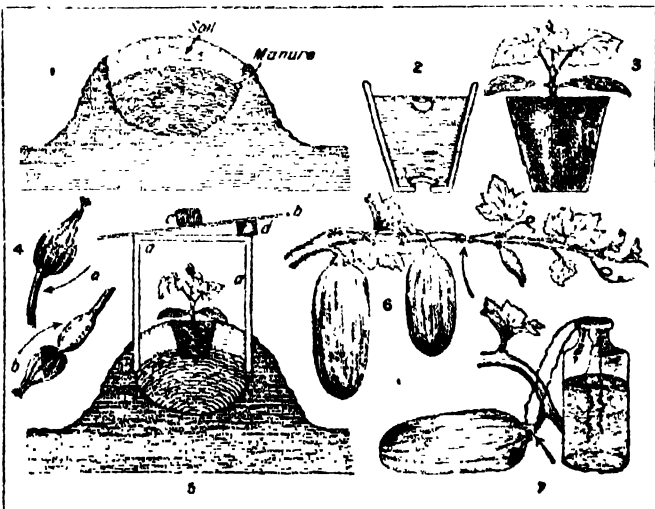


Marrow au Gratin. Savoury and appetizing dish which can be prepared in half an hour.

marrow must be prepared and cut into fingers and the apples pared, cored, and divided as for apple pie. Fill the pie-dish with alternate layers of marrow and apple, strewing granulated sugar between each layer, also a little grated lemon rind. Cover the fruit with a good short crust and bake the pie in a moderate oven. The time for cooking depends on the variety of apple which is used.

MARROW: In Bones. The fatty substance in the interior of bones, which is known as the marrow is the chief manufactory of the red corpuscles of the blood. Bone marrow is often given to people suffering from pernicious anaemia and other blood diseases. It can be used in the form of a glycerin extract, or spread like butter on bread or toast, and flavoured with a little pepper and salt.

MARSALA. The Italian wine made in the vineyards of Marsala is of the nature of



Marrow Culture. 1. How to prepare a mound. 2. Seed sown in pot. 3. Seedling potted-on and ready for planting out. 4. Fruiting and non-fruiting blooms: a, male; b, female. 5. Plant in position: a, shelter; b, glass; c, weight; d, ventilating block. 6. When and where to stop in order to swell fruits. 7. Artificial feeding: worsted taken through stem with ends in water.

sherry and Madeira, and is pale amber in colour with an attractive bouquet. It is served with soup or fish in place of sherry, and as a dessert wine. See Wine.

MARSH MALLOW: The Plant. This hardy biennial plant (*Malva sylvestris*), which grows wild in Britain, reaches a height of about 2 ft. and bears reddish flowers in summer. The roots are thick, long and tapering. They bend easily, are whitish-yellow outside, white and fibrous inside and abound in mucilaginous juice. They are sometimes used medicinally. The leaves of the herb should be picked and dried in August. See Hollyhock, *Malva*.

MARSH MALLOW: The Sweet. To make this, dissolve 2 oz. gum arabic in a ½ pint water, then strain it. Put it into a small saucepan and add 4 oz. loaf sugar; stir till melted, then boil until a firm ball is obtained from the syrup. To test it drop a little into cold water, rub it between the fingers, and if it forms a ball it is ready.

Remove it from the fire, flavour it with orange flower water, and work in the stiffly beaten whites of 1 large or 2 small eggs. Spread this mixture out in a layer on a thick bed of confectioner's starch, which can be purchased at any large store. Cover it over with another layer of starch and leave it till next day. It should then be ready to cut into squares. Well dust the pieces with starch and pack them away in airtight boxes.

MARSH MARIGOLD. This decorative, water-loving plant grows about 1 ft. high, and bears yellow flowers in spring. The marsh marigolds are useful plants for the sides of lakes, streams, and pools. Water may be allowed to flow on the roots, or may simply permeate the surrounding soil. The best month in which to plant them is October. *Caltha palustris*, 12 in., is the common yellow marsh marigold, of which there are several



Marsh Marigold. Clump of the golden water plant which will grow in a damp corner of the garden.

varieties. The finest of all is *Caltha polypetal*, 18 in., with rich yellow blooms. Marsh marigolds have creeping root stocks and are increased by division in spring. See Marigold.

MARTEN: The Fur. Of the various kinds of fur obtained from the marten tribe, baum marten and stone marten are the best known. The finest of the baum marten skins are obtained from Norway, and are dark brown in colour. The tails, which are sometimes made to resemble sable tails, wear well, but in texture they are coarser than sable.

Stone marten wears and looks almost as well as baum marten, but the tails are not so good, and the skins have to be arranged in a special manner to obviate the marks caused by joints.

Fisher fur is obtained from another species of marten and, like baum and stone marten, is employed for making stoles, wraps, mufflers, etc. See Fisher Fur; Fur; Sable.

MARVEL OF PERU. This is the common name of *Mirabilis jalapa*. This herbaceous perennial is hardly only in well-drained soil in



Marvel of Peru, a showy perennial for a sunny, sheltered border.

moor districts; in cold places, or heavy soil, the roots should be lifted in autumn and stored in boxes of soil under glass for the winter. It forms a bush about 2 ft. high and bears flowers of different colours on the same plant. If seeds are sown in a heated greenhouse in spring the seedlings will bloom in the summer of the same year.

MARZIPAN: The Sweetmeat. Marzipan is made from almond paste, coloured, shaped, and flavoured in a variety of ways. Marzipan potatoes are made by forming the almond paste, slightly flavoured, if liked, with vanilla, into the shape of very small new potatoes. Mark a few eyes on each, and roll them in a little powdered chocolate.

To make cherries, colour the paste with cochineal and roll it in the hands into little balls. Very thin strips of angelica will make the stalks. With careful shaping, half open pods of peas can be made with almond paste coloured with spinach green; apricots, with saffron-coloured paste. Pastes coloured with cochineal and with saffron are joined to make an apple.

To make fruit marzipan, add, when making the almond paste, a tablespoonful of thick pulped fruit or jam to every lb. of sugar. Colour and flavour it as desired. When the paste is cool, roll it out to a thickness of about ¼ in., and ice it very thinly with royal icing. Cut it into any small shapes before the icing has quite set, and decorate each sweet with a tiny silver ball, scrap of angelica, or small piece of blanched nut.

Dried French plums or good prunes and good quality dates can be split in half and stuffed with coloured, flavoured marzipan.

Attractive sweets are also made by moulding a ball of coloured marzipan, and pressing on to each side of it a blanched almond, or half a walnut that has been toasted for a minute or two in a moderately hot oven. See Almond Paste, Chocolate; Icing.

MASCALON. Also known as a marmaron, this is the name of a raised ornament found on Venetian

glass and glass made in that style. It is a little blob of glass on which the impression of a mask or face is stamped while hot. The term is sometimes used when the design is a floral or other ornament.

In furniture the mascarons are the figure of a face, either of man or animal, used as a centre feature in decoration. It is found in pieces of the time of William and Mary, and frequently on those made in the Louis XIV style. See Venetian Glass.

MASCOT. Anything given or acquired as a supposed luck-bringer or warder off of ill fortune can be included under this heading, and it can range in size from a tiny charm to a bold effigy or model on the front of a motor car or on an aeroplane's fuselage.

Commonest perhaps are small models, in various materials, of animals, such as a black cat, a dog, or a pig; the sign of the zodiac; a special setting of a gemstone for the wearer's birth month; the numbers 7, 9, and 13; Egyptian scarabs, and various charms in New Zealand greenstone.

Jacinth and amethyst are considered by the superstitious to be particularly lucky gems. A black opal is said to attract fortune to an artist if bought or found personally but not if received as a gift. A mounted hare's foot, or monkey's paw, a coin with a hole in it, a sprig of white heather or a spray of four-leaved shamrock, is sometimes treasured as a talisman. A horseshoe when nailed up as a mascot (the superstitious tell us) should be ends upward or the luck will run out. Grotesque dolls come and go as fashionable mascots.

Mascots for motor cars are made of glass, metal, plastic, or rubber, and many of the models are symbolic of speed. Those of glass can be illuminated from within, by means of a bulb and an electric switch. Car mascots are usually fitted to the bonnet, sometimes to the radiator filler cap. In the eyes of the law it is an offence to have a mascot so mounted that it projects beyond the front of the bonnet.

MASDEVALLIA. This orchid is suitable for cultivation in a glasshouse having a minimum temperature of 55 degrees. The plants must be potted in a compost of peat, orchid fibre and sphagnum moss, with sand and crushed charcoal added. The compost must be kept reasonably moist throughout the year. When repotting becomes necessary it should be done in February. A few of the best kinds are Veitchiana, vermilion; ignea, reddish; and tovarensis, white. There are many hybrids raised by cross breeding between these and other species.

MASK. Any covering disguise for the face, or upper part of the face, with openings for the eyes and, if necessary, for the mouth, is called a mask. These have been used from the earliest times of the theatre on the stage.

Silk or satin half masks are worn at a masked ball, while the men and animal faces sold for the 5th of November and at Christmas time are bought by children for disguise and for fairy plays. Beautiful or grotesque masks are



Mascaron. Left, cup with blue and white stripes, and gilt bosses of lions' heads. Right, bowl with spiral threads, gilt mask, and small bosses.

Reproduction of the Director, Victoria & Albert Museum, S. Kensington

executed in a great variety of materials for wall decoration by oriental and other artists. The mask used in fencing is of iron netting with a padded frame fitting over the head and round the face to protect it from foil thrusts. See *Fancy Dress*.

MASK FLOWER. These half-hardy perennials (Alonsoa) bear small, snapdragon-like flowers in the summer time. They may be grown in pots under glass or be planted out for the summer. Propagation is by cuttings in a frame in August. The rose-red Alonsoa Warscewiczii is one of the showiest. The plants must be kept in a slightly heated greenhouse in winter.

MASONRY. The whole art and craft of working in stone, from the rough shaping of the block to the completion of the finished product, is known as masonry. The term is also used to describe those parts of a structure which are built in stone. Stone being expensive material to build with, only the facing stones are generally squared up and worked to a fair face. The interior of the wall is made up with rough material, and the inner face lined with the faced stone, or with brickwork.

Masonry differs from brickwork in that generally the stones vary greatly in dimensions, and call for greater skill on the part of the operatives to get a perfect bond. Walls made of stone have to be considerably thicker than those of a similar height in brickwork. Exceptions are when the walls are built with coursed stones properly squared and pointed, in which case the walls may be thinner than in brickwork.

MASSAGE. Method of curing various muscular, nervous, and vascular maladies by rubbing, stroking, kneading, and otherwise treating the muscles with the hand. The four principal actions in massage are termed *pétrissage*, *effleurage*, *friction*, and *tapotement*. *Pétrissage* or kneading is done by pressing the palm of the hand into the muscles, and grasping, kneading, rolling, and squeezing them by the thumb and finger. *Effleurage*, or stroking, should be done with the palm of the hand, which at the end of a stroke should glide back to the starting point. *Friction* is a circular movement done with the finger tips or palm of the hand. *Tapotement* is done by the hands swinging from the wrists, and this movement should be light, sharp, springy, and very rapid.

Another division of the movements in massage is associated with the Swede, Peter Henry Ling. He divided them into three: active, passive, and resistive. Passive movements are done by the operator, active movements are done by the patient himself. Resistive movements are done while the patient resists, or by the patient while resistance is supplied by the operator. These movements increase circulation.

The National Hospital, Queen's Square, London, W.C., gives a recognized certificate. Students from other hospitals and schools must satisfy the examiners of the Chartered Society of Physiotherapy, at Tavistock House (North), Tavistock Square, London, W.C.1, which grants certificates of proficiency.

MASTER: His Duties. The relation of master and servant is entered into by agreement. This need not be in writing unless the agreement is to be for more than a year from the day on which it is made. An agreement of service which does not state how long the service is to continue is supposed in English law to be for a year, but subject in practically every case to reasonable or customary notice.

In very many occupations there has grown up a customary period of notice. Thus, a domestic servant is entitled to give or receive a month's notice. The editor of a newspaper by custom is entitled to six months' notice. But most cases depend not on custom, but on

what is reasonable. And what is reasonable depends upon the kind of service and the kind of engagement.

Length of Notice. It may be stated, as a general principle, that the higher the class of service the longer notice has to be given on either side, and this is because it is always more difficult for a man in a higher grade of employment to get a job than it is for a man in a lower grade, and it is also more difficult for the employer to procure a new servant of a higher grade than of a lower grade. Thus, an office boy would be entitled to a week; a managing clerk to at least a month. But as judges and juries may take different views of what is reasonable, it is always wise in a contract of service to stipulate for a particular length of notice.

It is the servant's duty to serve faithfully. This implies an obligation not to disclose his master's secrets. A servant who does this may be restrained by injunction from continuing to disclose such secrets, and is also liable for damages. It is also a servant's duty to obey orders, so long as those orders are not unreasonable. It is the master's duty to pay his servant's wages punctually and without deduction; though in a few cases, by special agreement, a master will be allowed to deduct penalties in the nature of fines for spoiled work, etc. A servant must be punctual; he must also be diligent, that is to say, he must work his best and not be guilty of slackness. If a servant, in carrying out his master's orders, incurs any liability, the master is bound to indemnify the servant against such liability.

A master is liable to outsiders for any act done by his servant within the scope of the employment. This is a very wide phrase. It does not mean that the servant must have been acting in obedience to express orders; in fact, the master may be liable under this doctrine although the servant was acting contrary to orders. Suppose, for example, a tradesman employs a motor lorry in his business, and he tells the driver that whenever he is driving down the High Street he is not to exceed a speed of 8 miles an hour because of the traffic. In disregard of these orders, the man drives at twice that speed and negligently damages another vehicle. The employer is, nevertheless, liable.

Liability for Wrong-doing. A master may even be liable for his servant's fraud. This was held in a case where the manager of a bank stated in answer to an inquiry that X Y was a person of good substance to whom credit might be allowed, although at the time he knew that X Y was in very low water and could not meet his obligations. The bank was held liable for the fraud, because the statement was made by their servant acting within the scope of his employment.

In the same way, a servant who is employed to make contracts binds his master within the scope of his employment. For instance, if A has a shop and he employs a man to manage it, and to do those things which managers generally do, and he makes a contract such as a manager in the ordinary way would be entitled to make, A must carry out that contract or pay damages if it is broken, although he expressly told his manager not to make contracts of that particular kind.

But if the person with whom the manager was dealing had notice that the manager was not entitled to make that particular kind of contract, then A will not be liable. It is for this reason that some firms print upon their letter paper and other business documents, such as invoices, a warning that no orders are to be accepted on behalf of the firm unless countersigned by one of the directors, or something of that sort. Others give warning that no verbal orders for goods are recognized.

The servant who is guilty of a wrongful act may himself be liable as well as his master.

And where the servant, acting on his master's behalf, makes a contract in his own name or without disclosing that he is a servant, the person with whom he contracts may, on discovering that he made the contract as a servant, sue the master, or may elect to sue the servant personally. If so, then the servant has a right to be indemnified by the master.

A master is not liable for any criminal offence committed by his servant unless he expressly authorized it or was in some way a party to it, in which case he can be convicted, sometimes as a principal and sometimes as aiding and abetting or as being an accessory before or after the fact. If the driver of a horse, being a servant, is guilty of cruelty to the horse, he alone is liable; but if the cruelty consists in driving a horse which was unfit to be out on the road or unfit to be employed to pull a load of such a weight, the master will also be liable if the horse was sent out with his knowledge or approval.

There are some statutes which make a master liable for offences committed by his servant, e.g. under the Licensing Acts. There are others which make the master liable in the first place, but with liberty to him to prove that the servant was really responsible and acted against orders, as, for example, certain adulteration of food prosecutions.

The Right to Dismiss. A servant who is dismissed without due notice may bring an action. The only answer to such an action is that the servant has been guilty of misconduct. Disobedience to proper orders is good ground; in the case of domestic service, immorality is a good ground; dishonesty is sufficient; so is impudent behaviour, so is persistent and gross neglect and inattention to work which is likely to cause serious loss to the employer; so is systematic unpunctuality.

A slight breach of contract will not entitle the master to dismiss a servant without notice. The misconduct must be something which amounts to a repudiation by the servant of the proper relationship between them; that is to say, something like a fundamental breach of contract. Unless the contract of service says so, a servant cannot be dismissed merely for being ill; but if the illness is of such a protracted nature or of such a kind as to render the servant permanently unfit or unfit for a long period to carry out his duties, the master may dismiss him.

If a servant has been guilty of an offence which entitles the master to dismiss him instantly, the master must either do so or forfeit his right. For example, if the servant is guilty of impudence to his master on Wednesday, and the master says nothing about it until Saturday, which is pay-day, and then on paying the wages tells the servant to go without notice because of the impudence of Wednesday, the master is wrong. He ought on the Wednesday to say, "You are dismissed now, but if you like to remain to complete your week I will allow you to do so."

It sometimes happens that a master dismisses a servant summarily without justification, and after he had dismissed him discovers that the servant has been guilty of something which would have justified dismissal. If the servant brings an action for wrongful dismissal the master is entitled to rely for his defence upon the second ground, of which he was not aware when he dismissed the servant. See *Accident; Character; Employers' Liability; Insurance*.

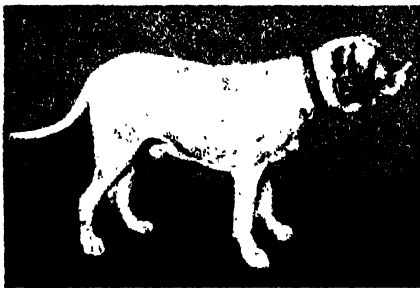
MASTICATION. Unless food is thoroughly masticated, unnecessarily hard work is thrown on the digestive organs, and sooner or later indigestion results. Each mouthful should be chewed until it is fluid and free from lumps. Eating solid food dry ensures more thorough mastication. Starchy foods, such as bread and potatoes, should be well chewed. These

are partly digested by the saliva in the mouth, and the more thoroughly the saliva is mixed with them the more easily will their digestion be completed in the intestine. Particular care should be taken with fat, cheese, hard-boiled eggs, nuts, and other substances.

Children should be taught to masticate their food thoroughly. Old people whose teeth are decayed should get artificial teeth, or, as an alternative, they should have all food cut up very finely with a mastic machine; otherwise digestive troubles, headaches, etc., will result. See Diet; Food; Indigestion; Teeth.

MASTIC CEMENT. Brick, burnt clay, or limestone powdered and mixed with litharge, oil, or some similar substance make what is known as mastic cement. It is used in constructional work for such details as bedding an iron casing into masonry, or the laying of a floor on a concrete or similar foundation. In making this cement care must be taken thoroughly to pulverize or grind the materials. If good results are required on fine work, the crushed material should be thoroughly sifted through a fine sieve. See Cement.

MASTIFF. Almost the oldest of British breeds is the mastiff, which is a most faithful custodian of home or person, and so powerful



Mastiff A prizewinner of this formidable English breed of house dog

that no one dares to risk a fall with him. When carefully trained, he is not savage, but he should not be chained. Mastiffs of two colours are bred, brindle and fawn.

The body is massive, broad, and deep, with strong legs set wide apart, giving the dog a square appearance. He should be of great size and weight, yet active when properly proportioned. The legs, both front and back, should be straight, that is to say, the hind legs should be parallel, but the hocks fairly well bent back. Back and ribs should be wide and muscular. The head is broad between the ears, the muzzle short and broad under the eyes, and nearly parallel in width to the end of the nose. The mastiff is somewhat expensive to keep, needing plenty of meat and ample room. See Dog; Kennel.

MASTINE. This is a mixture used for staining wood. It is made to imitate mahogany, rosewood, light oak, weathered oak, fumed oak, and antique oak. Of the nature of an oil stain, it may, if required, be thinned with turpentine. It can be obtained in tins (1 lb., 2 lb., or 7 lb.) through any colourman. See Stain; Turpentine.

MASTITIS. Inflammation of the breast, or mastitis, is usually due to the entrance of a microbe through an abrasion of the nipple. The nipples should be kept scrupulously clean with soap and water, and may then be daubed

with the following: Compound tincture of lavender, 1½ oz.; glycerin, 1 dram. If the nipple becomes fissured or abraded it should be washed with boracic acid lotion after nursing and then anointed with a paste consisting of equal parts of bismuth carbonate and castor oil.

If the breast becomes painful, hot, and swollen, the child should be withdrawn. Hot fomentations are applied, and the breast and the arm on the affected side should be supported.

MASTODYNIA. The painful neuralgia of the breast known as mastodynia sometimes gives rise to a lumpy condition which may be mistaken for commencing cancer. A timely consultation with a doctor will save a lot of worry. Commonly it is an affection of pregnancy or of the period of suckling when the breast is overtaxed.

MAT: For the Floor. Hall door mats should be of good quality fibre or they quickly wear down in use. Another important point is that they should fit the doorway or the sunk space often provided for them inside the front door. Fibre centre mats are obtainable with wool borders in various colours.

For use on landings and in the hall outside the doors of various rooms if mats are required they should either match the stair carpet or be of a plain colour that tones with it, or of skin.

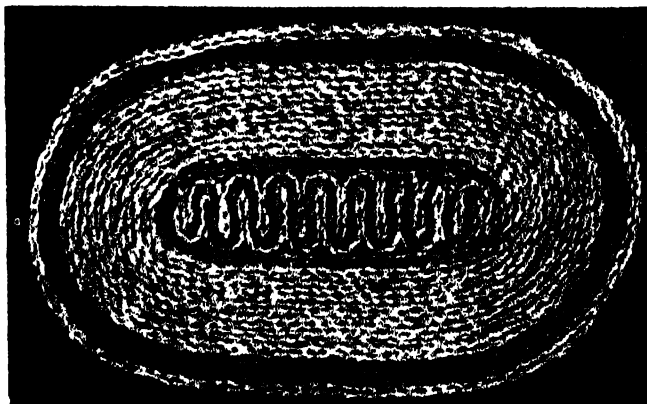
Mats for the bathroom may be of non-slip rubber in a wide range of colours, of course towelling, or of cork. In terry cloth they are patterned in good designs and all colours. Cork mats wear better if framed narrowly in wood.

For country cottage or bungalow use rush mats, or those in dyed coco fibre are suitable.

Wool mats can very easily be made at home in the same way as rugs. The necessary implements and materials are a gauge, a patent crochet hook, a pair of scissors, a piece of canvas and the wools. Charts in colour, giving suitable patterns for these mats, can be bought, or a pattern can be evolved or copied by the worker. Directions for making are given in the article on Rugs.

Making Rush Mats. Rush mats, suitable for bedrooms, kitchens, informal or bungalow living-rooms, loggias and bathrooms, can easily be made at home. The necessary rushes are sold in bundles, and all that is required besides is a packing needle and some string. Before they are used the rushes should be soaked in water for 8 or 10 hours. They can be dyed to any shade required. Most mats, however, can be made chiefly of natural coloured rushes, coloured ones being only used for forming a pattern in the centre and for making the border.

The rushes should be plaited in strands, each strand consisting of three or more rushes, according to their size and the thickness of the mat. A mat such as is here illustrated is made by stitching the plaits together round



Mat. Oval-shaped mat made of rushes, suitable for kitchen or bathroom

and round until they form an oval. The plaits may either be sewn flat or edgewise, whichever is preferred.

To work the centre of the mat, take three small plaits, one green, one natural, and one brown. Stitch them closely together to form a zigzag pattern and, when a sufficient length has been made, bind the edges with a plait of rush in order to give the oval effect. The rest of the mat, save the border, is of plain rushes, with the plait sewn edgewise. To join the rushes, put the butt end of the new rush to the thin end of the other one, and plait it in about 4 in. from the end of the last rush. Such mats will wear better if the ends are plaited in and made neat. Any discoloured portions should be cut off. When colour is introduced care should be taken to have an even number of rows. A break in the middle of a row should be avoided.

Useful Hints. To prevent mats from curling up at the corners, as they are apt to do after a few weeks' wear, turn them occasionally and use them upside down. In the case of plain rope or hemp mats this can be done without any obvious change of effect, for the two sides are usually alike; but if they are decorative mats with coloured patterns some other method must be adopted. Weighting the corners is usually effective, but if this is done with coloured mats an oddment of material which harmonizes with the predominant shade is necessary. Cut the material into four small squares, turn them in neatly all round, then fold them into triangles and sew them on to the four corners of the mat, first inserting a tailor's lead weight in each corner. Take stitches right through the mat with a long darning needle, and sew firmly so that the weight will not strain the stitches.

Where mats are placed on linoleum the floor immediately beneath them should not be polished, otherwise they will slip when stepped on and may cause accidents. On carpeted floors, in particular, dust quickly accumulates underneath mats, and for this reason the latter should always be removed when the carpet is swept.

Coloured mats which have faded may be restored to brightness by washing them with warm, salted water, or with water to which a little vinegar has been added. If made of Indian matting they may also be scrubbed, rinsed well, and left in the open air or in a draughty place to dry. Stains which will not yield to ordinary treatment should be rubbed with benzine or washed with a solution of water and ammonia. Information about table mats may be found in the entries on Duchesse Cover, Luncheon Set, Table Mat. See also Embroidery; Ruffa; Rug.

MATCHBOARD. One of the most useful materials for the woodworker consists of narrow, thin boards planed smooth on one side, grooved on one edge and tongued on the other. When a number of them are fitted together they form a fairly solid, firm structure, and the interlocking effect of the tongued joint makes it draughtproof.

There are several varieties of this matchboard; the ordinary kind is known as tongued, grooved, and beaded, as there is an ornamental bead worked on one side next to the tongue, thus breaking up the surface and offering scope for decorative effect. A plain matching is made without this beading, and when available is useful when a large, smooth surface of timber is required. Another type is known as tongued, grooved, and V-jointed, as the edges are bevelled, and when the boards are put together they exhibit a V-shaped groove at each joint.

Sizes vary from 3½ in. to 6 in. wide, 4½ in. being common. Thickness ranges from ½ in. to 1 in., the sizes commonly used being the ½ in. and ¾ in. These sizes are nominal and actually measure slightly less, so that when



Matchboard. Showing how to use an odd piece of matchboard to drive other lengths up tightly

reckoning by the square—that is, sufficient lumber normally to cover an area of 100 sq. ft.—it will be found necessary to add about 10 per cent.

Matchboard is applied by nailing it to the wall or to thin battens fixed firmly to the walls and packed up where necessary, so that the faces of all these strips are in line. The strips should run at right angles to the direction of the joints between the boards, and should be spaced not more than 2 ft. apart for the $\frac{1}{2}$ in. matchboard.

When erecting matchboard care should be taken to get the first piece fixed right and true, as all the others will be affected. The second piece is driven home into the groove, as shown in the illustration, by means of a mallet and an odd bit of the matchboard, this being inserted into the groove or over the tongue to prevent the edge being spoiled by hammer marks. The tongue and groove is rather tender and should not be strained, nor should the boards be allowed to lie about, as the edges are easily broken. See Board.

MATELOTTE. This is a dish of fresh water fish stewed in a savoury manner and accompanied by a matelotte sauce. Occasionally birds are cooked in the same way. The fish should be all of one kind, and must be stewed gently in wine or stock well flavoured with wine, also one or two carrots and onions are added to the stew, as well as some spice.

After the fish is cooked strain the liquor and add to it $\frac{1}{2}$ pint rich brown sauce and 6 mushrooms, prepared and cut in pieces. Let all boil up together, and then simmer very gently about 20 min., removing the scum as it rises. Strain this sauce and add 1 oz. butter beaten with a few drops of anchovy essence and a grate of nutmeg. Mix it well over the fire and sprinkle in a pinch of sugar. Serve the sauce poured over the fish.

MATERNITY BENEFITS. In Great Britain a cash grant of £4 is payable to a woman on confinement by virtue of her own insurance or of her husband's. To qualify for the benefit 3 ft., 3 ft. 6 in., 4 ft., 4 ft. 6 in., and 5 ft. the father or mother must have paid not less than 26 National Health Insurance contributions since entry into insurance, and not less than 26 contributions must have been credited with in the previous year. A woman confined of dependable overlays are stuffed with the best twins or a greater number of children is entitled to a grant of £1 for each. See Insurance.

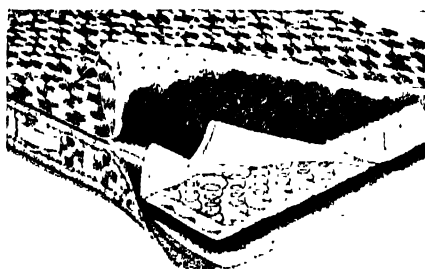
MATTING. Woven rope, hemp, coconut fibre, etc., are used for making matting, which differs from the ordinary doormat only in that the latter is cut to a certain size, while the former can be bought by the yard. Narrow lengths of it are sometimes used to cover the floor of a hall or passage, while it is also frequently laid down during furniture removals to protect a polished floor from scratches, etc. In certain illnesses where

absolute quiet is essential to the patient's recovery, matting is sometimes laid down on any tiled or uncovered floors near his room so that the sound of walking may be deadened, and in severe cases it may even have to be used on the pavement outside the house.

MATTOCK. The mattock is a tool similar to a pickaxe, but having two broad blades set in different planes. Generally the blades take the form of an axe-like edge on one end and a chisel edge on the other. They are made of cast steel, the handle being inserted in a hole near the centre of the tool.

The mattock is used to loosen earth, grub out roots, and the like, the earth being turned up with the chisel end of the tool; any roots, such as would be found in grubbing operations can be cut with the axe end. The chisel end curves slightly inward to facilitate turning up the earth, while the axe end is formed practically at right angles to the helve, as in this position the tool can be used more effectively for cutting through obstructions.

MATTRESS. Mattresses are divided into two principal types, top mattresses or overlays and under mattresses or mattress supports. The first type are of two kinds, stuffed



Mattress. Fig. 1. Overlay mattress with part cut away to show construction of spring centre encased in a luxurious stuffing of hair

Courtesy of Heal & Son

overlays of hair, wool and hair, or wool only and inner spring mattresses. Mattress supports are of four kinds—ordinary woven wire springs, spiral springs in a wooden frame, box springs and flange supports. Both types and

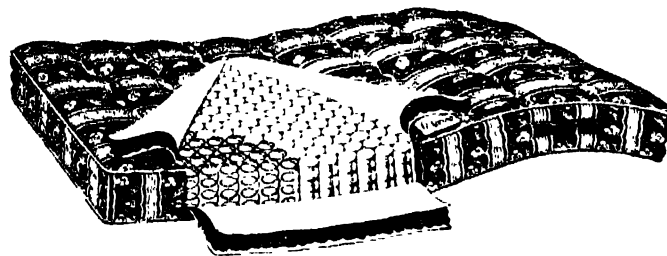


Fig. 2. Overlay mattress with pocketed springs ensuring resilience and comfort. The layer of hair stuffing is encased in an envelope of material before being sewn on to the mattress

Courtesy of Le Seur & Partners, Ltd.

most makes, are made in widths of 2 ft. 6 in., 3 ft., 3 ft. 6 in., 4 ft., 4 ft. 6 in., and 5 ft. Luxurious overlays are stuffed with pure horsehair of the best quality. Excellent mattresses are obtainable made of white wool while in the centre, while the overlays are stuffed with the best coloured wool. These last are heavier and less resilient than the first and second kinds. Such overlays require periodical cleaning and remaking to keep them hygienic and free from lumps. The process of cleaning and picking up the hair and wool stuffing is done by a purifying machine and the overlays are afterwards sewn into the cleaned or into new cotton tick and rebuttoned.

Inner spring mattresses are the more comfortable form of top bedding. Such a mattress may have a spring centre and thick outer padding of horsehair as seen in Fig. 1,

or pocketed springs as shown in Fig. 2. There is a thin layer of hair in a separate envelope of material between the outer and inner casings of this mattress, and it is supplied with ventilators at either end, which render it hygienic. These mattresses do not, by reason of their construction, require remaking.

Mattress Supports. A most important adjunct to the overlay is the supporting mattress. Some overlays are deep and resilient in themselves and are therefore perfectly comfortable to sleep on when merely supported by the ordinary woven wire mattress. Added comfort may be obtained by using a protector consisting of a tick pad reinforced with a number of thin flexible strips encased in pockets sewn across the width of the pad. A flock mattress may be used as an extra support under a feather bed.

Spiral spring mattresses in good quantities are practically free from all sagging. In this form of mattress the finest make of springs should be used, otherwise they will press down in wear and the mattress ceases to provide an even surface of support. The best kinds are noiseless and rustless, and the open top of the spiral construction as seen in Fig. 3, renders the springs accessible for dusting so that they can be kept clean. Such a mattress can be fitted on to any existing bedstead and used in conjunction with a hair or hair and wool, or inner spring overlay. To get the fullest benefit from the springs the overlay should not be too thick. More expensive qualities than the one illustrated are obtainable.

The box spring mattress, in conjunction with a good overlay, makes a most comfortable bed. Such mattresses are now made to fold in three parts or in half, so that they are easier to handle. Some makes have flexible sides and the interiors consist of a multitude of small spiral springs clipped together with steel clips. There are no cord fastenings to become broken or woven wire to sag or stretch. The whole bed of springs is secured on a substantial and well-finished wood base, upholstered and covered with ticking.

The flange mattress support has an elastic top edge and is similar to the box spring mattress, with the exception of the flange frame, which is narrower at the lower part of the mattress and enables it to slip into position inside the bed frame and reduces the height without lessening the total depth of the support. Such a mattress is suitable for the lower beds designed by modern makers.

The older kind of wire spring mattress is difficult to keep clean. Every week it should be brushed with a stiff, dry nailbrush, and the

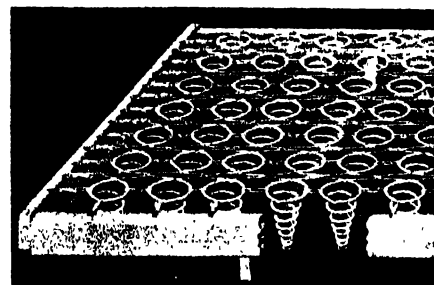


Fig. 3. Support mattress on wood frame for use on an existing bedstead with overlay mattress

Courtesy of Staples & Co., Ltd.

woodwork wiped with a damp cloth. In warm weather the cloth should be moistened with disinfectant. Once a year the wire mattress should be taken apart by having all its bolts and screws unfastened. It should then be taken out of doors and pure carbolic poured round the holes where the bolts have been. This should be followed by an application of boiling water over the carbolic. The wire springs and the woodwork should then be scrubbed with a stiff hard brush dipped into carbolic and water. The mattress should be left outside for some hours to become thoroughly dry.

A wire mattress that has become rusty can be restored thus: Paint it all over with aluminum paint, using a small, pointed brush that will get inside the mesh. See Bedding: Bedstead. Box Mattress. Cot; Divan.

Maxillaria. The culture of maxillaria, a family of hothouse orchids, is the same as that for masdevallia (q.v.). See Orchid.

MAXINA. A sequence dance in common time, the maxina is composed of five parts. The partners stand side by side facing the line of dance, the man's shoulder just behind the girl's her left hand in his left her right hand passing above her shoulder to take his right.

In the first part both glide the left foot forward and count 1. Then the right foot forward and count 2 the left again, counting 3, and the right, counting 4. The partners chase to the left, commencing with the left foot and counting 1 and 2, then to the right starting with the right foot and counting 3 and 4. The next step is to glide the left foot forward and count 1, then the right and count 2. Both pivot round on the right foot the girl turning under the hands, cross the left foot over the right and count 3, then point the right foot in front and count 4. The last

bar is repeated, beginning with the right foot.

The second part is simpler. Placing the left heel to the floor, both partners turning to the left count 1, then hop on the right foot and count 2. This is repeated 8 times until a complete circle has been made.

The movements in the third part are as follows: Glide the left foot forward and count 1 then the right, and at the same time dip bending the knee, and count 2. Bring the left foot forward with the heel to the ground in front of the right foot and count 3. Close the right foot up to the left and count "and". Move the left to the rear with the toe to the floor and count 4. Repeat the movement.

Right and left glides are a feature of the fourth part. Glide the left foot forward, count 1 the right, count 2, then the left, count 3. The man closes right to left while the girl pivots round to face him, counting 4. In the fifth part both hold as for the fox trot (q.v.), and two-step or waltz for 4 bars.

MAXIXE. Like most of the dances introduced from South America, the maxixe is danced in such a way that it can be done in the long grass. Thus, the feet point straight, the knees are kept a little bent and the legs wherever possible, are kicked forward, raising the feet a little at the back to free them from the grass. The steps, on the whole, are kept small, the movement being taken from the knees and not from the hips, as in other dances, keeping the upper parts of the legs comparatively still. The foot is kept almost flat, with a slight drop on to each step occupying more than one beat.

The figures may be done in almost any position. The dance usually starts in the waltz position, after which the couple may pass into an open position in which they face the same way. The arms need not be altered, but the man may take the girl's left in his right hand and either stretch it straight out or turn it at her back, as in his original position. See Waltz.

MAY: The Tree.

This is the popular name of hawthorn (*Crataegus oxyacantha*). There are varieties with white and red, single and double flowers. Under the name of white-thorn or quick it is largely used for hedge planting. See Hawthorn: Hedge.

MAY BUG. The may bug, also known as the cockchafer, is a rather bulky looking brown beetle, about 1 in long and $\frac{1}{2}$ in wide coated with delicate down, the hind body tapering to a point beyond the wing covers. Towards the end of May or early in June the beetle may damage the foliage of trees; but it is in the larval stage that it is most harmful. The female deposits her whitish eggs in a batch of nearly 100, a little below the surface of

the soil, and the grubs for more than three years feed on the roots of grass and herbaceous plants.

The visits of rooks and starlings to the lawn should be encouraged, as they hunt systematically for the grubs, and their powerful bills enable them to reach their prey. Failing this natural remedy infested ground should be dressed with a mixture of nitrate of soda and soot, in the proportion of $\frac{1}{2}$ owt. of nitrate to 7 bushels of soot for $\frac{1}{2}$ acre of ground. See Insecticide.

MAY FLOWER. This is a hardy and evergreen creeping shrub (*Epigaea repens*), which grows well in sandy peat if planted in a shady position, and bears fragrant white flowers in May. Planting may be done during spring or autumn; propagation is by division of roots in October.

MAYONNAISE. This name is given to a sauce or salad dressing. The ingredients are:

1 yolk of egg 1 gill salad oil, 1 teaspoonful dry mustard, 1 tablespoonful cream, $\frac{1}{2}$ tea-spoonful castor sugar, 2 tea-spoonfuls tarragon vinegar, 2 tea-spoonfuls white vinegar, salt and pepper. Mix together the dry ingredients and the egg yolk. Whisk in, drop by drop, the salad oil, then the vinegars. Add the cream last, and very gradually. Beat all the time with a slow regular motion, always working in one direction. At the end add a dessert-spoonful of boiling water.

It is essential for the success of the mayonnaise that the oil be added drop by drop and each drop mixed in thoroughly.

Mayonnaise sauce is used as a dressing for salads, with lobster, crab, chicken, salmon, etc., which are then known as lobster, crab, chicken, or salmon mayonnaise respectively.

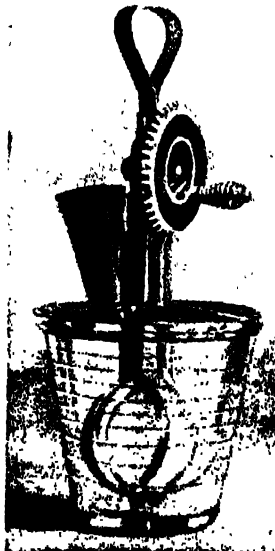
Mayonnaise Mixer. This is the name given to a contrivance which assists in preparing mayonnaise dressing for salads, etc. The ingredients are placed in a bowl, and a small funnel, which is attached, filled with olive oil. The oil then can be mixed in drop by drop. The mixer is worked by means of a handle. See Salad: Salmon.

MAZUS. This hardy herbaceous perennial of creeping growth is suitable for planting in gritty soil in the rock garden. Mazus pumilio and reptans with purplish mauve flowers, are the species in cultivation. Propagation is by division in spring.

MEAD: How to Make. Mead is a drink made with honey, flavoured with hops. To make it, add to each gallon of water 4 lb. honey. Boil together for $\frac{1}{2}$ hour, and skim it



May Bug or cockchafer



Mayonnaise mixer used with funnel from which olive oil can be mixed in drop by drop

MAY

What to do in the Garden

Flowers	Fruit	Vegetables
Harden off summer bedding plants. Plant half-hardy annuals raised under glass. Plant scabiosa and border chrysanthemums. Prepare stakes for dahlias. Stake and tie hardy border plants. Thin out the seedlings of hardy annuals. Lift spring bulbs from flower beds and plant on a reserve border. Divide polyanthus, double daisy, and anemones and replant the pieces. Sow seeds of Chinese primula and chrysanthemum under glass.	Spray fruit trees with the poisonous arsenate of lead or an insecticide to kill caterpillars. Pinch off the ends of vine shoots leaving only two leaves above the bunch of grapes. Disbud peach trees by gradually removing most of the young shoots. Leave one shoot at the base and another at the top of each old branch. Mulch the soil round newly-planted fruit trees with manure. Lay straw between strawberry plants. Water fruit trees on walls in dry weather.	Sow runner and French beans and late peas. Sow the main crop of beetroot. Earth up early potatoes. Prepare trenches for celery. Sow lettuce at fortnightly intervals. Sow the rosette (cabbage), an autumn cabbage. Plant cucumbers in a frame. Sow vegetable marrow out of doors. Thin out superfluous seedlings of onion, carrot and other vegetables.

Food in Season

Fish	Poultry & Game	Vegetables	Fruit
Bass, bream, brill, cod, dory, eel, flounders, gurnard, hake, halibut, herring, ling, mackerel, mullet, plaice, salmon, skate, snail, sole, trout, turbot, whitebait, whiting.	Capons, chickens, ducks and ducklings, fowls, geese, guinea fowls, hares, ortolans, pigeons, prairie hens, pheasants, pullets, quail, rabbits, ruffs and reserves.	Artichokes, asparagus, beans, beetroot, cabbage, cardoons, carrots, cauliflower, chervil, cress, cucumber, endive.	Apples, bananas, cherries, figs, gooseberries, grapes, lemon, oranges, melons, nuts (various), pears, pineapple, rhubarb, strawberries (hot-house).

Notes for the Month

MAY 1.—May Day. Stock Exchanges closed.
MAY 12.—Anniversary of Coronation of George VI, 1937.
MAY 24.—Empire Day.
MAY 26.—Queen Mary's Birthday.
MAY 31.—Union Day S. Africa.

well. Measure the liquid and allow 1 oz. hops to each gallon, then boil it up again for $\frac{1}{2}$ hour. turn it into a wooden vessel, and stand it till the next day. It must now be put into a cask and to each 4 gallons of mead add $\frac{1}{2}$ bottle of brandy. Let it ferment, and when it has finished close the cask tightly and leave it to stand. In about eight months it will be ready to bottle.

MEADOW RUE. This is an attractive hardy herbaceous perennial with ornamental leaves and flowers of various colours in summer. They flourish in ordinary soil. The chief kinds are *Thalictrum aquilegifolium*, 3 ft., purple; *Delavayi*, 2 $\frac{1}{2}$ ft., mauve; *dipterocephalum*, 5 ft., lavender rose; and *glaucom* 5 ft., grey leaves and yellow flowers. *Adiantifolium* 9 in., with fern-like leaves, is suitable for the rock garden. Propagation is by division of the plants in early autumn or spring or by sowing seeds under glass in autumn or spring.

MEADOW SAFFRON. These beautiful hardy bulbs bear crocus-like blooms in autumn. The leaves, which are very large do not appear until spring. They should be planted in grass or among low growing evergreen plants so that the flowers are not spoilt by soil splashed up in rainy weather. The bulbs ought to be set 3 in. deep in July-August. they thrive best in well-drained loamy soil.

Colchicum autumnale the common meadow saffron, has purple blossoms. The finest is *speciosum* with large rose-purple flowers. Propagation is by offsets which may be taken off the bulbs when the leaves have died down, or by seeds.

high are sown as soon as they are ripe.

MEADOW SWEET. This is the popular name of a wild plant. *Spiraea ulmaria*. It bears cream-white fragrant flowers in early summer. See *Spiraea*.

MEAL. Meal, in one sense, means grain ground to powder. There are thus various kinds of meal, e.g. barley meal, maize meal, oatmeal, and wheatmeal, although sometimes the word meal is dropped when referring to them. See Barley; Diet; Flour; Food; Oatmeal; Wheat.

Mealies. This is another name for maize meal or Indian corn. See Maize.

MEALY BUG. One of the most troublesome of the pests that damage fruit and plants cultivated under glass is the mealy bug. Its body is covered with a substance like meal, and is furnished with a number of waxy thread-like filaments, those at the tail end being the longest. The larvae are hatched from a constant succession of eggs, and soon settle down to suck the sap.

An effective remedy is thorough cleansing of leaves and shoots with an insecticide, using a small brush or a sponge. Isolated bugs are best dealt with by means of a brush dipped in methylated spirit or paraffin oil. See Insecticide.

MEASLES: How to Treat. Measles is an acute contagious disease which mostly attacks children, but sometimes occurs in later life. One attack is usually preventive of others. It is very infectious and generally spreads in epidemics in spring or autumn. The cause is



Meadow Rue. Hardy herbaceous perennial valued for its flowers and decorative leaves

most probably a microbe which has not yet been identified.

Infection is conveyed in the breath and saliva, from the skin if touched, and probably also by clothing and toys. About 10 days after infection the disease begins suddenly, resembling a severe cold with sneezing, running at the nose and eyes, and temperature up to 102° or 103°. Three or four days later red spots appear on the neck, face and body and tiny rose-pink spots may be seen inside the mouth. The rash begins to fade after two or three days, there follows a desquamation of fine scales and convalescence is rapid.

The chief danger with measles is to the lungs and respiratory passages. Bronchitis often leads to broncho-pneumonia. Catarrhal laryngitis may occur before the eruption, as it may be due to concurrent diphtheria, the doctor should be told if a child suffering from measles becomes croupy. Inflammation of the ear may also occur.

Measles is intensely infectious before the eruption appears, and when there is reason to think a child has become infected he should be isolated at once. A large, airy top room is best. It should have a fireplace and should be kept at a moderate uniform temperature of about 65°, and the air should be moistened by means of a bronchitis kettle sending steam into the room. Moist air is necessary to soothe the irritable mucous membrane of the bronchial tubes. Screens should be placed round the bed. The healthy children should be kept as far as possible from the sickroom, or sent to another house. The diet is that for fever. The child should be sponged all over with warm water every day. Broncho-pneumonia is the most serious complication and requires constant medical attention.

The patient should not leave bed until the temperature has been normal for seven days. A week later he may go out of doors if the weather be fine, but in cold weather not for two or three weeks. The diet must be nutritious and digestible during convalescence. Cream is a valuable food at this time, and it

is advisable to give cod liver oil for 8 or 10 weeks, with iron if there is anaemia; chemical food would be a suitable form.

The safeguarding of young and delicate children from infection is of great importance. Greater care in recognizing early stages of the disease in older children and prompt isolation will be helpful. The things to watch for are a rise of temperature in the evening and swelling of the lining of the lower eyelid. If spots have appeared in the mouth it is too late, infection has probably been transmitted.

MEASUREMENT. This means the act and result of measuring. Correct measurements are necessary in order to make the various articles described in this work, and for many of these diagrams with measurements are given. With most of the woodworking articles a cutting list is supplied giving dimensions of the various pieces of wood required.

To measure the height of anything there is a simple method which most persons can put into operation. Take, for example, a flagstaff. A certain distance, say 40 ft., must be marked in a straight line from the base, and a stick of a certain convenient length placed in the ground at the spot. The next step is for the measurer to go still farther away from the tree, still in a straight line, until, with his head on the ground, which must be level, he can see the top of the stick and the top of the flagstaff in the same straight line.

This spot should then be noted and carefully measured. In the present case we will assume that it is 6 ft., making the line from the flagstaff 46 ft. in all. These lines should give two imaginary triangles, as shown in the diagram.

All that now remains is to work out a sum in simple proportion. As the line C E is to the line D C, so is the line B E to the line A B, which is wanted. In the example here taken it can be assumed that the length of the stick above the ground is 4 ft. The actual sum is: As 6 is to 4, so is 46 to the answer.

$$\frac{4 \times 46}{6} = \frac{184}{6} = 30\frac{2}{3}$$

Thus, the height of the flagstaff is 30 $\frac{2}{3}$ ft.

In actual practice calculations will usually be less simple than the one given, but the principles are exactly the same. See Centre to Centre; Drawing, etc.

MEAT: Food Value.

Short fibred meat, such as the breast of chicken and game, is more digestible than long fibred varieties. In eating the latter—beef, mutton and veal—it is well to cut them in thin pieces across the fibres. Beef is probably best when the animals are about four or five years old. They are then more nourishing, bulk for bulk, than the flesh of younger animals. Veal is less digestible than beef. The fatter the meat, the less water it contains, hence the more economical it is for people with whom it agrees. But it is also less digestible.

The amount of water in meat is very large; 1 lb. of average beef contains $\frac{3}{4}$ lb. of water and only $\frac{1}{4}$ lb. of nutritive matter. The same applies to lean mutton, lamb, veal, venison, fowl, hare, and pigeon. Pork is $\frac{1}{2}$ water and goose $\frac{2}{3}$. But very fat beef or mutton may be only $\frac{1}{3}$ water. Bacon contains very little water, only about $\frac{1}{3}$ of its weight. The caloric, or heat-giving, value of meat is very high. Too much meat eaten in summer is inclined to overheat the blood.

Beef and mutton are more digestible when under-cooked, but lamb, veal, and pork are unpalatable and unwholesome unless well cooked. Roasted meat is less digestible than boiled. The roasting or baking of meat leads, however, to the development of appetizing substances which are included under the name of *sauzone*. These stimulate the flow of

gastric juice. The plan of stewing meat in an inner vessel within that in which the water is boiling has everything to recommend it. Casserole cooking is perhaps the best and most economical method of cooking meat, as the meat is cooked in its own juices, which are served up with it. Thus nothing is lost. On account of the high temperature at which meat is cooked in frying it is less digestible than when cooked by other methods. All meat becomes more tender by hanging for some time, but it is not desirable to let it hang too long and allow putrefactive changes to develop. Freshly killed meat requires more time to cook than meat that has been well hung.

Hints on the choosing of meat are given under the headings for the various kinds—beef, mutton, veal, pork, etc.—in this work.

It is most essential that meat directly it comes from the butcher should be thoroughly examined and at once put away in a cool, well-ventilated larder, also that in summertime careful observation should be made that no blow fly has had access to it.

Poisoning by Meat. The symptoms of meat poisoning come on about three or four hours after taking food and are usually due to eating pick pies, sausages, or cold pork which has begun to putrefy, or which has been kept in a badly ventilated and unclean larder. In rare instances it takes the form of botulism.

It is generally well to give an emetic of a tablespoonful of mustard in half a pint of warm water if vomiting has not yet occurred. This should be followed by a full dose of Epsom salts, according to the patient's age. For faintness or collapse brandy or other stimulant may be given, and hot water bottles should be placed about the patient. For severe cases put a hot linseed poultice to the abdomen. A doctor should be sent for at once.

Meat Extract. Extracts of different meats may be bought in bottles of varying sizes, and are used as stimulants or in the preparation of soups and gravies.

Meat Jelly. Jelly is extracted from the bones, gristle, and sinews of meat. To produce a jelly of any strength the bones are chopped in pieces and must not have been previously cooked. The boiling must be gentle and continuous for from 8 to 12 hours, and the foam must be carefully removed.

Knuckle of veal or mutton, also the feet, make excellent jelly, and one which, having little flavour in itself, can be readily adapted either for a sweet dish or a savoury jelly. Ox feet produce a very strong jelly, but not so delicate as calf's feet. Cow heel is obtained usually from the tripe dressers, and has already been boiled; but a good jelly for mixing with milk or other ingredients is obtained from it.

Although meat jellies have little actual food value in themselves, it is possible to mix with the meat which has been cooked, pounded, and pressed through a sieve, and either introduce it in the form of small shapes set in the jelly, or let it mingle with it and give a marbled appearance. Pieces of chicken or other delicate meat can be set in meat jelly, and the moulds may be decorated with leaves of asparagus jelly and butter put through a forcet.

Meat Pie. There are two kinds of meat pies, those which are baked in pie-dishes where the meat is covered over the top with pastry, and raised pies, where the meat is entirely enclosed in paste.

For the pie made in a pie-dish almost any kind of meat, poultry or game will serve, pork excepted. The pastry covering consists of puff, rough puff, or flaky paste, but it is made with a larger proportion of fat than is considered necessary for most fruit pies. Meat pies are baked from $1\frac{1}{2}$ to $2\frac{1}{2}$ hours, according to size, therefore the crust must be rich with

fat or it will become dry during the process of cooking.

The best meat to use for pies is that in which the fat is not superabundant, and all skin and gristle must be left out when cutting it up. In the case of poultry or game whole joints are laid in the pie-dish, but when butcher's meat is used strips or slices are cut and no bone left.

To enrich the gravy of poultry or game pies, a layer of steak pieces is laid at the bottom of the dish. Flavours are used in accordance with the character of the meat. They may consist of shallots, parsley, herbs, mushrooms, oysters, foremeat balls or hard-boiled eggs. Slices or dice of ham or bacon may be added with advantage.

The raised pie is made with hot-water crust. This crust, being very short, must be kept only warm enough to mould, and is always better for lying covered up with a thick cloth for some hours before it is made up. For raised pies generally pork or veal is required. Instructions for making these will be found under the headings *Pork and Veal*. See also *Bacon*, *Botulism*, *Beef Diet*, *Food*, *Game*, *Lamb*, *Mutton*, *Poultry*, etc.

MEAT SAFE. Whether the housewife possesses a refrigerator or not the meat safe is an important item of furniture in the kitchen. This is particularly the case where larder accommodation is limited. No hot food should be placed in the refrigerator, so that a zinc-lined meat safe, with ventilation regulator, in which food may be put to cool, is a great asset. In a small larder it is also often desirable to keep meat separate from other dishes and foods.

The newer models have table tops of white porcelain enamel, or in some cases of chromium plate. These have all the advantages of a safe and table combined and are constructed on hygienic principles with washable galvanized interiors. In some of these safes sliding, galvanized steel lined trays for smaller articles of perishable foods are provided. The finish of the safe is in enamel to match the woodwork of the kitchen, or in oak, and it is mounted on pivot-bearing castors, so that when in use as a table it can be easily moved to a convenient position for pastry making or other culinary preparation.

Meat safes form a part of some kitchen cabinets which are provided with a cupboard lined with galvanized steel for this purpose and properly ventilated. Small enamelled tin meat safes with panels of perforated zinc or iron wire gauze in the door and sides are also useful in the small kitchen as they take up little space and can be fixed to the wall. See *Kitchen*; *Larder*.

MECONOPSIS. This is a biennial and perennial herbaceous plant of great beauty. It comes chiefly from China and other far Eastern countries, and some of them have flowers of most exquisite blue colouring. The Welsh poppy (*Meconopsis cambrica*) with orange or yellow flowers is an excellent plant for a shady wall or for shady crevices in the rock garden and often sows itself freely, but the exotic kinds require rather special treatment. They need shade and well drained though deep moist soil of peat and loam.

Aculeata, blue; *integrifolia*, yellow;



Meconopsis. Flower spike of the Himalayan poppy

Wallichii, blue; and *Baileyi*, blue, have flowers of exquisite beauty. These are biennials, raised each year from seeds sown in boxes of fine soil in a frame in May. If the seedlings are planted out in autumn they should be protected from excessive rains in winter by pieces of glass raised a few inches above them. *Meconopsis regia*, from Nepal, which bears large pum-pose-coloured flowers, is the latest novelty in this group.

MEDICAGO. Of the large family of creeping plants bearing the name of medicago only one is worthy of cultivation in ordinary gardens. This is the tatar clover (*Medicago chinensis*), an annual raised from seeds sown under glass in April. Its yellow flowers are borne in summer, and are succeeded by quaintly twisted legumes. It is generally grown as a pot plant in a sunny window in a mixture of loam, leaf-mould, and some old mortar.

MEDICINE: How to Give. The following are important rules to be observed carefully in administering all medicines:

Read the label every time before pouring out, and again after pouring out, the medicine. Never give medicine in the dark. Shake the bottle, even if not so directed.

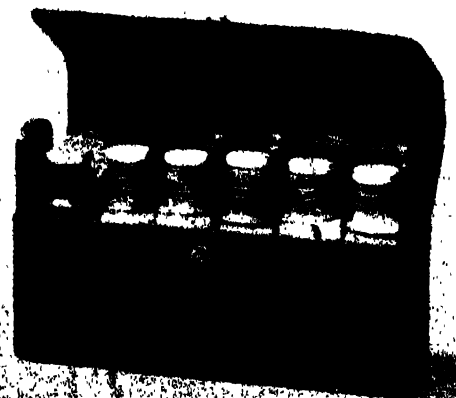
Use a graduated measure always; spoons and wineglasses vary. If minims are ordered, measure them in a minim-glass; drops of some liquids are twice as large as drops of others. Never guess at a dose.

When pouring out, keep the labelled side upward. When dropping a medicine, first wet the lip of the bottle with water. Give medicines, especially cod liver oil, out of perfectly clean spoons, glasses, etc.

If ordered to take medicine before or after meals, take it 20 to 30 min. before or after, unless otherwise directed. To dull the sense of taste when taking nauseous medicine, put a little ice or peppermint in the mouth, or chew a piece of orange-peel. Castor oil is most easily taken in coffee, orange juice, grape juice, or effervescent lemonade. Unpleasant powders should be given in water papers, purchasable at the chemist's. A pill is most easily swallowed if the head be bent forward.

In giving medicine to a resisting child, first try firm persuasion, then bribery. If these fail, hold the nose and put the spoon far back into the mouth. The child's arms can be held to the body with a towel. (See *Dosage*).

Medicine Case. A small medicine case holding some of the most useful of ordinary medicines is carried by many travellers. The one illustrated can easily be carried in the pocket. The case is of leather, and inside are



Medicine Case that can be carried in the pocket, an article of value to travellers

six small bottles containing medicines that are useful to ward off a cold, or in case of sudden illness. The medicines usually carried in cases of this kind include quinine, aspirin, and sal volatile. See First Aid.

MEDLAR. This summer leafing tree, *Pyrus (mespilus) germanica*, is valued for the sake of its white flowers in spring and for its curious fruits in autumn, though these are liked by few. Medlars must be left on the tree as late as possible and then stored until they are "blotted" or have become slightly soft. The tree thrives best in rather moist but well drained loamy soil and should be planted in autumn. It is propagated by grafting on stocks of pear, quince or white thorn and makes an attractive lawn tree. The Dutch and Nottingham are the best varieties.

Uses in Cookery. When gathered, medlars should be stored in a cool place until the early stages of decay are manifest. They are some-

times employed as dessert fruit, but are more often used for making jams and jellies.

MÉDOC. No Bordeaux wine is entitled to the name Médoc except that made from grape-grown in the Médoc, a strip of land on the left bank of the Gironde. Some of the famous wines of the Médoc are St. Julien, St. Estephe, Pauillac, St. Laurent, Cantenac and Margaux. See Bordeaux. Wine.

MELANCHOLIA. In the form of insanity known as melancholia there is extreme mental depression, the low state of the feelings being associated with mental pain or distress. Delusions tend to develop. There is a grave risk of suicidal attempts in melancholia and in the depressed states which border on it. Such cases, therefore, require most careful supervision, and this usually means that the patient ought to be in an asylum. See Insanity. Lunatic.

MELIANTHUS. This is a half-hardy bushy plant, 1 ft. or so high, which has graceful decorative leaves and reddish-brown flowers. The two kinds grown are major and minor, the former being the more valuable. In a border and at the foot of a sunny wall melanthus is hardly in mild districts, but in other places the roots should be protected in autumn. Propagation is by cuttings in August, or by seeds sown in early spring under glass.

MELOCACTUS. The melocactus is a species of cactus known by various popular names including melon cactus, pope's head, Turk's cap, and melon thistle. It has spiny, ribbed stems, topped by a sort of cylindrical cap, which gives the plant a curious appearance. Being a succulent greenhouse perennial, it requires a sunny position under glass, and a minimum winter temperature of about 45°. The plants need little water between autumn and spring.

MELON. Unlike other popular fruits, the melon can be raised from seed, but it is not hardy, and with one or two exceptions the varieties require heated houses and a temperature of 65° or 75°. The season is generally from May to October.

How to Grow. As melons love heat and moisture it is customary to grow them in pits, which are half sunk structures with low walls, sometimes lean-to's, sometimes span-roofs with brick-emased beds, not as a rule more than 2 ft. below the glass in the front.

When a plant is carrying several fruits, it is desirable to support them with netting.

For melons in hotbed frames less atmosphere moisture is desirable, because there is greater danger of stem canker. Syringing once a day suffices. Ventilation should be practised in fine weather. A piece of tile or slate should be placed under each fruit so as to keep it off the soil. Seeds should be sown singly



Melon cut open and seeds removed in order to show the depth of the flesh.

in small pots of loamy soil in spring, and when the seedlings are well rooted they should be planted in mounds of loamy (turfy) soil set about 3 ft. apart on a hotbed made up in a frame or glasshouse. When the plants reach the trellis fixed beneath the roof of the latter, their tops should be pinched off to cause them to form side shoots on which male and female flowers will be borne.

An important detail of cultivation is to pollinate several blooms at the same time by transferring the pollen from the male or staminate blooms to the female or pistillate blooms: if pollination is carried out on different days the early fruits will develop fully but the others will be small. As the roots push through the mounds of soil fresh loam must be added. To prevent the trellis becoming overcrowded with leaves the ends of the shoots must be pinched off at two or three leaves beyond the fruits.

Some of the best varieties for the glasshouse are Superlative, Eastnor Castle, Emerald, Gem and King George. For cultivation in a frame Hero of Lockinge and Little Heath are suitable varieties.

Table Uses. In addition to its uses as dessert, melon is also frequently served as *hors d'œuvres*. For this purpose it should be very cold, and is best placed on ice for some little time before it is served, together with sugar, pepper, and salt. Melon is also served as a cocktail made by peeling it when just ripe, removing the pips, and cutting the fruit into dice about $\frac{1}{2}$ in. square. Have ready 6 or 8



Medlar, showing the curious shape of the brown fruit.

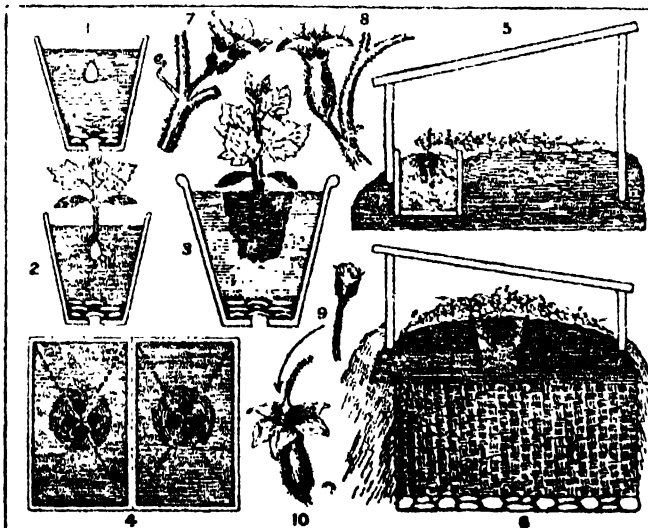
times employed as dessert fruit, but are more often used for making jams and jellies.

Medlar cheese is made by cooking some medlars until they are tender in a covered jar placed in a saucepan of water, then rubbing them through a fine sieve and adding $\frac{1}{4}$ lb. lump sugar and a teaspoonful of allspice to every lb. of pulp. When the sugar has dissolved boil the whole steadily until it sets firmly.

Medlar Jam. Medlars must be quite ripe and soft before they are used for jam. Wipe them with a cloth and put them in a preserving pan, just covering them with water. Stir them frequently while they simmer beside the fire for 30-35 min., or until they split. Pass the pulp through a rather coarse sieve, but fine enough to retain the seeds, and put it back in the pan with the grated rind and juice of a lemon and just under 1 lb. sugar to every lb. of fruit. The fruit should be weighed for this purpose before it is put into the preserving pan.

Boil the jam fast for 30-45 min., stirring and skimming constantly. When a little sets when dropped on a cold plate pour the jam into dry warmed jars and tie down at once.

Medlar Jelly. To make this preserve, put the ripe fruit in a stewpan and just cover it with water, adding to every 40 medlars the rind and juice of a lemon. When this has simmered for about 40 min., and all the fruit



Melon Culture. 1. How to sow seed. 2. Seedling ready for repotting. 3. Plant repotted. 4. Position on mounds in frames. 5 and 6. Other methods of planting. 7. Male flower. 8. Female flower. 9. Male prepared for fertilizing. 10. Pollination of female bloom.

sundae or custard glasses, partly fill them with the diced melon, and then add a sprinkling of castor sugar and a little kirsch and maraschino mixed. Only a few drops of liqueur must be used, otherwise the delicacy of the dish will be lost. Stand the glasses on ice before serving them on small plates.

Melon Pickle. To make melon pickle, pare off the outer rind of a melon before it is quite ripe, remove the seeds and pith, and cut into cubes. Put them in an earthen vessel, cover with good vinegar, and let them remain for 10 days, then pour all into a saucepan and simmer gently until they are tender. Drain them, lay them on a hair sieve, and when

cold insert a clove in each. Place the cubes once more in an earthen vessel, and pour over them a cold syrup made with sugar and water. Let it run off them a little, then put them into pickle-jars cover them with vinegar which has been boiled and allowed to go cold; cover the jars securely. This pickle is good with roast meat. See Greenhouse.

MELTON: The Cloth. An old-fashioned woollen cloth excellent for overcoatings, melton is impervious to wind pressure. Usually plain in colour, it can be recognized by its rather sharp touch. In course of finishing the cloth a nap is teased out of it, and this is cut short, leaving upright ends of wool fibre.

MENDING: A DOMESTIC NECESSITY

How to Cope with Wear and Tear in the Home

Further information about this important feature of good housekeeping will be found under such headings as Darning, Invisible Mending, Lace, Linen, Patching, etc.

A well equipped mending basket is essential for economy in the household. A good selection of needles, cottons, silk threads and darning materials should be stocked, with various widths of elastic in black and white, tapes and bias bindings. Besides the usual cards of linen and pearl buttons an asset for the mender is a glass bottle with a wide neck into which odd buttons are dropped. It can be seen at once whether buttons required are in stock. A large safety-pin should be kept, and on this are strung loose hooks and eyes. Reels of cotton can be strung on a cord or ribbon. A small magnet on a long length of tape is useful to pick up needles which are dropped on the floor. Pieces of material left over after making garments or other articles should be tied up and kept in a muslin bag for mending purposes.

Nothing that requires mending ought to go to the laundry. If there is not time to mend the holes neatly, then the torn edges can be drawn together with coloured cotton temporarily. Before clean articles are put away they should be gone over, and any that require buttons, tapes, or other mending put on one side.

Linen tablecloths or sheets should be darned with linen

floss, and an embroidery ring or hoop is a help in darning large articles. It is also possible to darn household linen and towels on the sewing machine. The foot of the machine should be removed, and the worn piece slipped into an embroidery hoop and this placed underneath the needle. The machine is worked so that lines of stitching are made backwards and forwards over the worn part. The hoop is then turned round and sewing continued in the other direction till the darn is completed.

When sheets become worn in the centre, they can be cut down the middle and the raw edges hemmed. The sides should be seamed together so that the little worn parts are in the middle and the worn portion is at the outside. When this process has been carried out and the sheet again becomes worn, the unworn parts can be made into slips for underneath the pillow cases, or into bolster cases. Old linen sheets are excellent for polishing dusters when cut up and hemmed, or for bandages when torn into strips.

A tablecloth that is becoming worn along the creases can have its period of service extended if a strip 2 or 3 in. wide is cut off one side and one end. When the cloth is folded the creases will fall on different lines, thus preventing further wear on the worn lines. Tablecloths that are worn too much to mend

can be made into table napkins or into centres for round table mats by cutting them to the desired size and neatly trimming the edges with suitable crochet or lace. Larger pieces may be used as tray cloths or side-board runners and trimmed in the same way. Towels that cannot be mended again make useful face cloths, dish cloths, or polishing cloths.

Patching and Darning. Darning a damask cloth or napkin requires patience if, instead of the usual lattice work, the design is copied. Fig. 1 illustrates how a simple pattern can be copied. The lengthway threads are made in the same way as those of an ordinary darn, but the cross threads are interlaced to form a pattern. The number of threads lifted or missed depends upon the web to be imitated. A cross cut on damask can be darned by commencing, as also shown in Fig. 1, on the wrong side of the material and the needle and cotton passed alternately over and under the edges of the cut till they meet. These stitches must not be removed when this preliminary darning is finished, but are darned across in the usual way on the lines of the thread of the damask, using a finer thread than that of the material and extending the darn well beyond the cut.

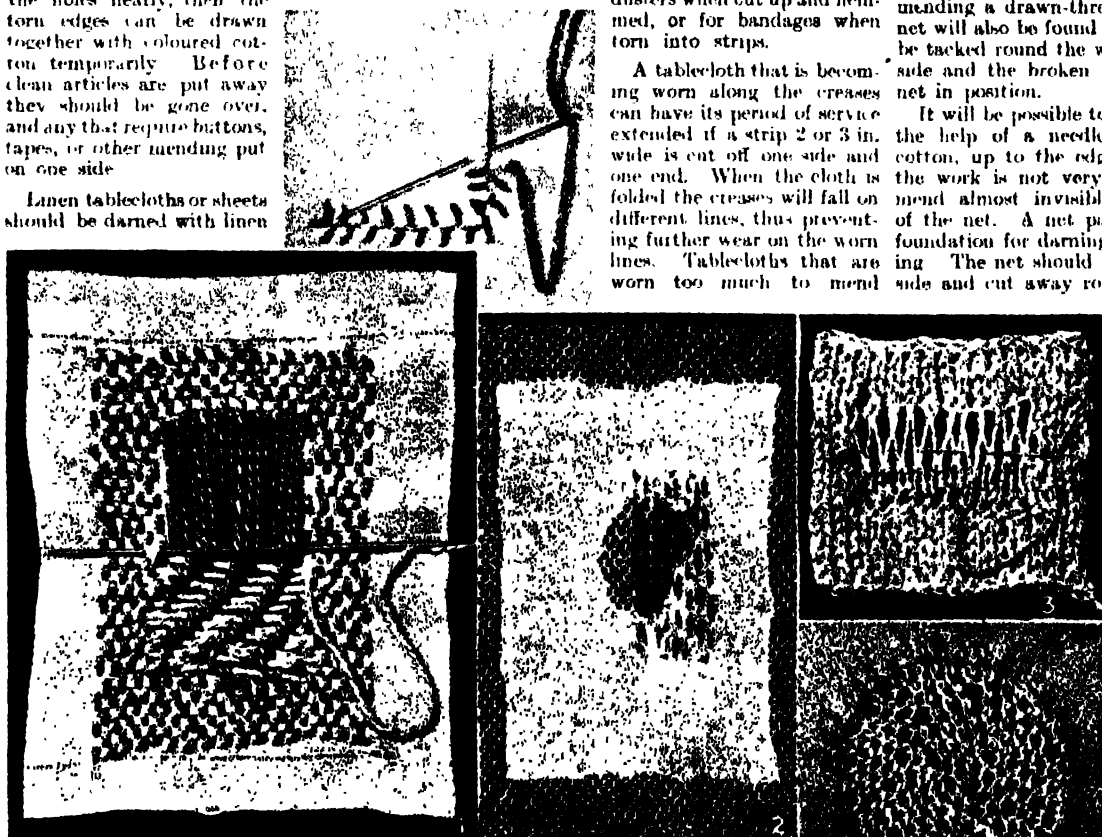
Men's underwear can be strengthened by saving portions of similar worn out garments and making a double thickness on the new garment where it is most likely to get worn. In patching garments it will be found a help if a thick pad of newspaper is placed under the part to be patched, as this aids in keeping the material in position.

In mending a worn place on fine underwear a piece of net should be placed on the wrong side under the worn place and the darn carried out over this foundation, as shown in Fig. 2. This method is useful when a blouse of fine lace or georgette is to be mended. In mending a drawn-thread tea cloth a piece of net will also be found a help. The net should be tacked round the worn place on the wrong side and the broken threads sewn on to the net in position.

It will be possible to draw the threads, with the help of a needle threaded with strong cotton, up to the edges of the cloth, and if the work is not very worn it is possible to mend almost invisibly over the foundation of the net. A net patch also makes a good foundation for darning a cotton or silk stocking. The net should be tacked on the wrong side and cut away round the darn when the

task is finished. For very fine silk stockings old veiling is excellent as a foundation material for a darn. To restore stocking web the material can be counterfeited by remailage, as shown in Fig. 3. Note setting of warp threads and the working of the web with the needle. The stitch is brought up through the loop and between two strands and passed under two strands, as shown in Fig. 3.

To mend a tear in a tweed or woollen suit, strands of the wool should be unravelled from the seams on the wrong side. The garment should then be stretched over a pad of white



Mending. Fig. 1. How a darn can be made in damask by imitating the design; above, right, preliminary stage in darning a cross cut in damask. Fig. 2. Mending a hole in fine woven material by placing a piece of net beneath it and darning over it. Fig. 3. Restoring stocking web by counterfeiting the material; this is known as remailage. Fig. 4. Repairing a hole in a kid glove with buttonhole stitch in silk of the same colour.

paper and tacked loosely into position, the wrong side being uppermost. If the tear is jagged or three-cornered, it should be drawn into position with a coloured thread. Now darn the torn edges closely together with the strand of wool, and continue taking fresh lengths of wool as they are required until the darn is completed. This is called invisible mending.

To mend a jagged tear, buttonhole round the torn edges with silk as nearly as possible the same colour as the material. On the wrong side draw the silk threads of the buttonholing together firmly, and press with a warm iron over a damp cloth.

Mending Gloves. Kid gloves that have become worn at the tips or at the bottom of the seams can be mended by buttonholing round the worn parts with silk twist of the same colour. Turn the glove inside out and cut away the kid that is worn. Do a row of buttonholing all round the edges, then a second row of buttonholing, slipping the needle into the first row. Continue this, drawing up the hole until it is filled. Turn the glove right side out. When suede or chamois gloves wear into holes they are more successfully mended by patching. Old gloves should be kept for this purpose. The patch should be neatly sewn in with silk on the wrong side.

A jagged tear in a mackintosh can be repaired by placing the tack flat down on a table, wrong side out, and pressing the edges together under strips of sticking plaster. A rubber mackintosh can be patched if a suitable piece of patching material can be procured by using rubber solution that is sold for mending bicycle punctures.

Carpet Mending. To mend a carpet, turn it on the wrong side and lay the torn pieces in position. Buttonhole each edge with carpet flax, then draw the two edges together by means of the double row of buttonholing. If there is a considerable worn area around the tear, the carpet should be slit down and a strip, taking in the worn part, cut away. The pattern should then be carefully matched, the carpet reversed, and the join carried out as directed above, by means of buttonholing. If a carpet is worn in the centre, it can have its period of usefulness considerably extended by cutting it down and placing sides to middle. To mend linoleum, first mark out in chalk the worn part. Cut it out with a sharp knife, then lay this pattern on the new piece that is to be used for mending, and cut it out. If the linoleum is patterned, care must be taken that the patch exactly corresponds in pattern to that which it is required to replace. Glue round the edges and underneath the new piece and fit this exactly into the space in the linoleum. Press it down into position and leave it to dry. Further information about mending articles in common household use will be found under the headings Boot Repairing, Chair, Crockery, Glass, Soldering.

MENINGITIS. Inflammation of the meninges or membranes covering the brain and the spinal cord is known as meningitis, and there are several kinds.

Tubercular meningitis is most common in children between 2 and 7 years of age. It accompanies tuberculosis of other parts, and sometimes follows measles, whooping cough, or a fall. The most marked symptoms at first are intense headache, sickness, chills and the child often utters a short, piercing cry. In all varieties of the disease treatment must be in the hands of the doctor.

Menopause. See Change of Life.

MENSTRUATION. The monthly flow of blood mixed with other fluids which is known as menstruation or courses begins with girls at puberty, and only ceases with the change of life. Usually the age at which it commences is from 13 to 15. At first there may be irregu-

larity, but as a rule this is of no consequence. The discharge continues for 3 to 5 days and should recur every 28 days. If it is excessive or there is much pain a doctor should be consulted immediately.

When menstruation first occurs a girl should be careful to guard against chills and avoid fatigue or any games that involve violent exercise. She will also be advised to keep away from dances and theatres, or any place where the air is likely to be hot and impure, and she must not touch alcohol. By attention to these points the length and the amount of the discharge will probably be lessened on future occasions. Baths, provided they are not cold, can be taken with impunity.

A great deal of ill-health in after-life results from neglect of proper precautions at the time when menstruation commences. Girls are seldom warned beforehand of what they are to expect, with the consequence that many suffer from serious nervous shock. This is particularly the case when children are away from home in a boarding-school, and are too shy to speak of the occurrence. In these circumstances, and very often even in their homes, they may receive no special care.

It is therefore of the greatest importance that mothers should understand how this function affects the health of young girls, and should see that proper precautions are taken.

Most healthy women are able to perform their domestic duties as usual during the period, but they should be careful to avoid any strain as, for instance in running upstairs or moving furniture.

MENTHOL: Medical Uses. By cooling oil of peppermint a crystalline substance is obtained which is known as menthol or mint camphor. In medicine menthol is often used externally as a local anaesthetic, particularly in neuralgic conditions, because of the sensation of numbness and coolness it imparts when applied to the skin. For this purpose an alcoholic menthol solution may be applied by a brush or the official plaster of menthol may be used, or the menthol in the solid form may be rubbed lightly on the skin.

The application of menthol may also be of great use in itching skin complaints. It is often used to relieve some forms of nasal obstruction and in deafness due to catarrh of the Eustachian tubes. For this purpose a small quantity of an ointment consisting of 5 grains or more of menthol in 1 oz. of vaseline may be put into each nostril. This ointment should not be put into the nose of an infant.

MENU. The French phrase *menu d'un repas* means the particulars or details of a meal or entertainment. A menu, therefore, is the whole of the dishes served at a meal, and the menu card is the card that contains particulars of each dish.

Many of the dishes that find a place on a menu retain their French names, and a knowledge of French cookery terms is necessary in order to make a selection from among them. The main groups into which the foods fall are as follows:

Desert = dessert
Legume = vegetable
Pâtisserie = pastry
Potage, Purée, or Consommé = thick or clear soups
Viande = meat
Volaille = poultry

Hors d'oeuvres is the name given to dishes served in small quantities at the beginning of a meal as appetizers. Grape fruit and melons are often used. Entrées are served after the fish.

French Names for Foods. The French and English names of the various foods are as follow:

Abricot = apricot
Agneau = lamb
Ananas = pineapple
Anchois = anchovy
Artichaut = artichoke
Asperges = asparagus
Bette-rave = beetroot
Bœuf = beef

Cailland = cod
Café = coffee
Canard = duck
Canet = cherries
Choufleur = cauliflower
Choux de Bruxelles = Brussels sprouts
Crevettes = prawns
Epinard = spinach
Faisan = pheasant
Foie = liver
Fraises = strawberries
Framboises = raspberries
Gâteau = cake
Gibier = game
Gigot = leg of mutton
Glace = ice
Harang = herring
Haricots blancs = haricot beans
Haricots verts = French beans
Homard = lobster
Huitre = oyster
Jambon = ham
Laitue = lettuce
Lapin = rabbit
Lard = bacon
Lièvre = hare
Maquereau = mackerel
Merlan = whiting
Mouton = mutton
Mouettes = hazel nuts
Noix = nuts
Oufs = eggs
Oie = goose
Oignon = onion
Pige = pie
Pardrix = partridge
Petits pois = green peas
Phe = pheasant
Poissons = fishes
Pommes = apples
Pommes de terre = potatoes
Poulet = chicken
Prunes = plums
Radfort = horse radish
Raisins = grapes
Ris de veau = sweetbread
Rognon = kidney
Saucisson = sausage (smoked)
Saumon = salmon
Truite = trout
Veau = veal
Venaison = venison

These foods are often accompanied by words or phrases indicating how they are cooked.

A la broche = roasted before a fire
A la brunoise = garnished with spring vegetables
A la crécy = prepared with carrots
Au double = devilled, or with hot seasoning
Au gratin = cooked with breadcrumbs
Au naturel = cooked very simply or served uncooked
Blanquette = cooked in a thick white sauce
Châtrouse = a mould (of fruit, jelly or some savoury mixture)
Chaudfroid = coated with chaudfroid sauce
Coulé = preserved in sugar
Compôte = stewed (of fruit)
En cocotte = served in a small earthenware dish
En kari = served in curry sauce
Fourré = coated with sugar, cream, etc.
Fricassée = stewed with white sauce
Maître d'hôtel = grilled
Rôti = roasted
Sauté = fried lightly

Soups are divided into *consommé* or clear, and *purée* or potage thick. Eggs are served *a la coque*, or boiled, or *sur le plat*, poached. The roe of fishes is known as *oeufs de poisson*. Fried potatoes are *pommes frites*, and mashed potatoes *purée de pommes de terre*. *Café au lait* is coffee with milk, or white coffee, *café noir* is black coffee, or coffee without milk.

For a formal dinner the following courses are usual, *hors d'oeuvres*, soup, fish, *entrée*, roast, vegetables, sweet, and *savoury*. For an informal dinner the *hors d'oeuvres* may be omitted, as may soup or fish, sweet or savoury.

A Dinner Menu. In compiling a dinner menu certain rules should be observed. For instance, the colourings of the various courses should contrast with each other and a variety of flavours be secured. The principal ingredient of one dish should not appear in another, for instance, if the soup is artichoke, artichokes should not be served as a vegetable. Two dishes of beef or mutton should not be served at the same meal; roast beef and hillets of beef, for example. Two fried dishes should not be served in succession, nor should two boiled ones. Two sauces of the same colour should not follow each other, and the same garnish should not be used on two dishes.

Variety is also desirable when two dishes are offered in the same course. For instance, if there are two soups, one should be clear and the other thick. If two fish dishes are offered, one should be plainly dressed, e.g. boiled halibut, and the other should be more elaborate, e.g. lobster cutlets. Of two *entrées* one should be cold and the other hot; one should be light and the other somewhat heavier. Of two sweets one should be light and cold; the other hot and more substantial. Of two *savouries* one should be hot and one cold, if this can be managed.

Menu Cards. Menu cards, or cards which contain the details of the menu for a big public dinner, are usually printed, in some cases this being very elaborately done and the card artistically decorated. Menu cards

suitable for the home can be bought, just as postcards can. These are headed and left blank for the cook or someone else to fill in the date and the details of the various courses. Menu cards for dinner parties and other festive occasions are often specially prepared, a design being drawn by an artist. This will frequently contain something appropriate to the particular occasion. Such cards can be obtained from a firm of printers, or are provided by the caterers.

Small white marble or china tablets, with stands to match, are sometimes used as substitutes for ordinary menu cards, and on these the menu is written in pencil. Holders for menu cards can be obtained in oxidized



Menu card supported in a holder consisting of a small china animal figure

metals, plated silver, or china, or in fancy designs suitable for a festive occasion such as a Christmas party. See Course, Dinner.

MERCERIZING. The result of the mercerizing process is to lend to good cotton some of the lustre of silk. Innumerable examples are found in mercerized poplin linings, and sewing, knitting, and embroidery threads. Linen and even jute may be mercerized, but not wool.

Mercerized cotton absorbs dye much more readily than unmercerized, and should the re-dyeing of mercerized goods be attempted care must be taken to see that the dye is thoroughly dissolved. Should any particles remain, they will lead to dark spots of colour upon the article. Dyeing after dyeing must be cautiously done at an even temperature, for if done before the fire with some portions exposed to more heat than others the colour will be irregular. A good plan in dyeing mercerized goods is to soak them first in water to which a little glycerin has been added.

It is only good cottons made from long-fibred cotton, combed in course of manufacture, that show any adequate benefit from the treatment. One can thus be pretty sure that mercerized cotton is good material. Properly done, the process of mercerizing strengthens the article, but when badly done runs it. See Cotton.

MERCURY: The Metal. This is one of the metallic chemical elements, and is also known as quicksilver. It is fluid at ordinary temperatures, but solidifies at -38° F. and

boils at 675° F. It is a very heavy metal, weighing almost $\frac{1}{2}$ lb. per cubic in. Pure mercury flows freely as a liquid, has a silvery white colour and a metallic lustre.

Mercury dissolves many metals, forming with them the alloys, known as amalgams. It is used in the manufacture of fulminate, for the percussion caps of cartridges, and is also employed in electrical appliances. It is the gauging element in thermometers, barometers, and other scientific instruments, being particularly susceptible to variations in temperature.

Another application is the mercury vapour lamp, giving a good light, but devoid of red light rays. See Barometer; Mirror; Pendulum; Thermometer.

MERCURY: The Drug. Employed in many different forms both externally and internally in a wide range of morbid states, mercury is one of the most valuable drugs in the pharmacopoeia, and externally is most commonly used on account of its strong antiseptic qualities. In any form the drug is always a more or less dangerous one, which should never be used except under a doctor's supervision.

It should never be forgotten that most mercury preparations are highly poisonous, particularly those used for their antiseptic action. The acute form of mercury poisoning is usually caused by swallowing corrosive sublimate. An emetic of a tablespoonful of mustard in a glass of warm water should be given and the doctor be summoned at once.

Before and after the emetic, give the beaten-up whites of four or five eggs, and then soothing drinks, such as milk, to each pint of which a wineglassful or two of olive oil is added. Put the patient to bed and keep him warm with hot water bottles.

MERINGUE. A meringue is a mixture of whipped whites of eggs and fine white sugar. Flavouring may or may not be added. In making successful meringues two rules must be observed—whip the whites of egg really stiff, and cultivate speed in the shaping of the mixture. The least scrap of moisture or egg yolk will prevent the whites from whipping up stiffly. If the egg whites are allowed to stand overnight they will whip up more quickly.

To make the mixture, whisk the whites of 6 eggs to a firm white snow, then sift in lightly 8 oz. castor sugar. The meringue is now ready to be shaped, and this may be done with a meringue paper fitted into a stout jam bag or with two dessertspoons. Cover a $\frac{1}{2}$ in. thick pasteboard or a baking tin with white kitchen paper slightly oiled, with pure olive oil, and force or shape the meringue on to the paper. If shaped with the spoons, gather up enough mixture to fill the spoon, smooth it round the edge, scoop the meringue out with the second spoon and drop it on to the paper, turning it over. It will be an egg shape.

When all are shaped sift over some castor sugar and bake them in a cool oven to a very light fawn colour. The oven must be really cool, and the meringues will take 2 to 3 hours to bake. When cooked, remove each meringue carefully from the paper, press in the soft portion inside, or remove it, and return them to the oven, which must be very slack until they are perfectly dry. They can then be stored in tins. Each egg-shaped piece is the half of a meringue, and must be filled with whipped and flavoured cream before being fitted to its fellow half.

This mixture is used for the decoration of many sweets. It may be made into a covering for fruits or may be forced in patterns on custards, trifles, etc. The meringue covering must always be dried in a cool oven, but the forced decorative pieces are dried on paper by themselves and fastened to the sweet with cream or fondant. Meringues are often filled with ice cream instead of whipped cream. It

is necessary to put the case on ice for a little while before filling it if this is done.

Meringue Gâteau. This sweet is made by adding a pinch of salt to the whites of 3 or 4 eggs, whisking them to a stiff froth, and then

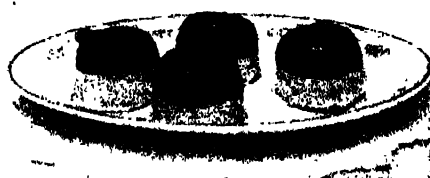


Meringue Gâteau made with a centre of cherries

folding them into 6 dessertspoonfuls of castor sugar. Heat the syrup from a small tin of red cherries, and use it to soak a sponge-cake ring. When saturated, put the ring on a dish, coat it with the meringue mixture, and leave it in a warm oven for about 20 min. so that the meringue becomes crisp and of a pale biscuit tint.

Let it get cold, then fill the centre with the cherries, piling them up high. Decorate the top with some stalks of angelica, and serve the whole with some syrup made thus: Boil 2 oz. lump sugar and a gill of water for about 6 min., then skim it well, and when it is cold stir in $\frac{1}{2}$ gill sherry and colour it with cochineal. Whipped cream sweetened and flavoured may be served separately.

Meringue Jelly. Small meringue jellies, coloured with cochineal, make an attractive party sweet. To prepare them dissolve a pint packet of strawberry jelly in hot water, and leave it until cold, but not set. Add a pinch of salt to the whites of 2 eggs, beat them to a stiff froth, and then beat them into the



Meringue Jelly. A party sweet for which fruit jelly and beaten white of egg are used

cold jelly. Continue beating for about 10 min., add the colouring, and stir the whole so as to get an even effect. Pour the jelly into small wet moulds, and when set turn them on to a glass or china dish.

MERINO. This is the name of a Spanish breed of sheep bearing exceptionally fine, short, and wavy wool and is the original of a type now reared in many other countries. Merino is thus a name for ultra fine wool, superior to that of cross breeds, and the name of the material has been transferred to the goods that are made from it.

Merino or French merino dress stuff is a fine twill made from merino wool. At once warm and light, made usually 40-44 in. wide, and available in cream and light shades as well as in black, it is a serviceable, if old-fashioned, dress stuff. In knitted underwear merino has by long custom a different meaning, and implies a wool and cotton mixture, generally soft to the touch resembling that of pure merino wool. Merino underwear is usually cheaper than all wool, and is bought on that account and also because it shrinks less than all wool in washing.

Merino wool in any of its forms tends to shrink when washed. The tendency is seen in soft, fine baby flannels which should continually be stretched, first in one direction and then in the other, while drying. Stockings made from merino wool contract and thicken because the material felts easily. Soap assists the felting, and for this reason all soap used in washing should be carefully rinsed out.

MERTENSIA. This borage-like herbaceous perennial is suitable for the border or rock garden. It thrives in ordinary well-drained soil and is increased by division in spring or by seeds. The oyster plant (*maritima*) and *alpina* are both of low growth and bear blue flowers in early summer. Taller kinds suitable for the border are the Virginian cowslip (*pulmonarioides*) and *sibirica*; they are about 15 inches in height and bear blue flowers in May.



MERTENSIA. Blue flowers of the species *sibirica*, a plant suitable for a shady border

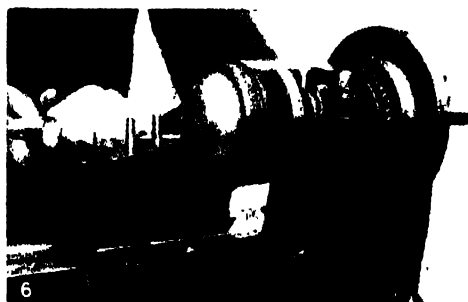
METAL POLISH. There are two chief varieties of metal polishes. One is made up of rottenstone 2 oz., soft soap 1 oz., and a strong solution of oxalic acid, sufficient to make the whole into a thick cream. The second is composed of fossil earth 2 oz., oleic acid 2 oz., oil of turpentine 4 drams, mixed into a smooth paste.

A liquid polish is made as follows: Mix soft soap 2 oz. with solution of ammonia 5 oz. and separately mix kaolin 4 oz., with petrol 9 oz. Place the two liquids in a tin and shake them well together. A simple form of metal cleaning liquid is made by dissolving oxalic acid 1 oz. in hot water, 1 pint. This is rubbed on to the tarnished brass work with a cloth and cleaned off with a separate cloth upon which

whiting has been placed. These polishes are not for silverware.

METAL SPINNING. Just as the potter moulds clay on his wheel, soft sheet metals are shaped on the lathe with smooth steel tools. Metal spinning as it is called, is employed for making lamp containers and similar vessels and by using wooden formers the metal can be shaped in almost any profile.

The process requires a good deal of experience in the behaviour of sheet metals when subjected to local pressure. Where large quantities of one article are required, pressing in a stamping machine is resorted to, but a well spun container of moulded form, finished in bright metal, gives a better finish than the product of the power press, unless the work is subjected to a subsequent operation while rotating in a lathe. To exemplify spinning in its simplest form, a piece of wood is held in the lathe and turned up to any desired profile, with curves and corners suitable to the thickness of the metal which is to be spun. This former, as it is called, appears in the photographs. A special tool rest, Fig. 1 is then rigged up, which may be of the ordinary type but with a flat topped toe, having several holes in which the operator can place steel pegs to suit his own convenience. A disk of lead or soft aluminium sheet is screwed by a central screw to the former. By working the shank of the long-handled tool against the steel pegs in the tool rest, using the peg as a fulcrum, and bringing the tool up to the disk with a sweeping action, the revolving metal can be formed into shape. The metal is greased



before and during the spinning operation, soft soap or vaseline being commonly used. The hands are held firmly under the support, the steel end being placed between two pins in the rest. The nose of the tool is held a little below the lathe centre at a point near the centre of the job; the pressure is applied towards the larger diameter of the disk.

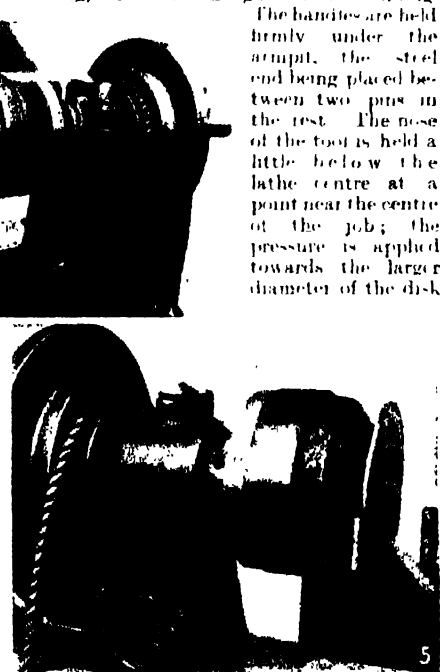


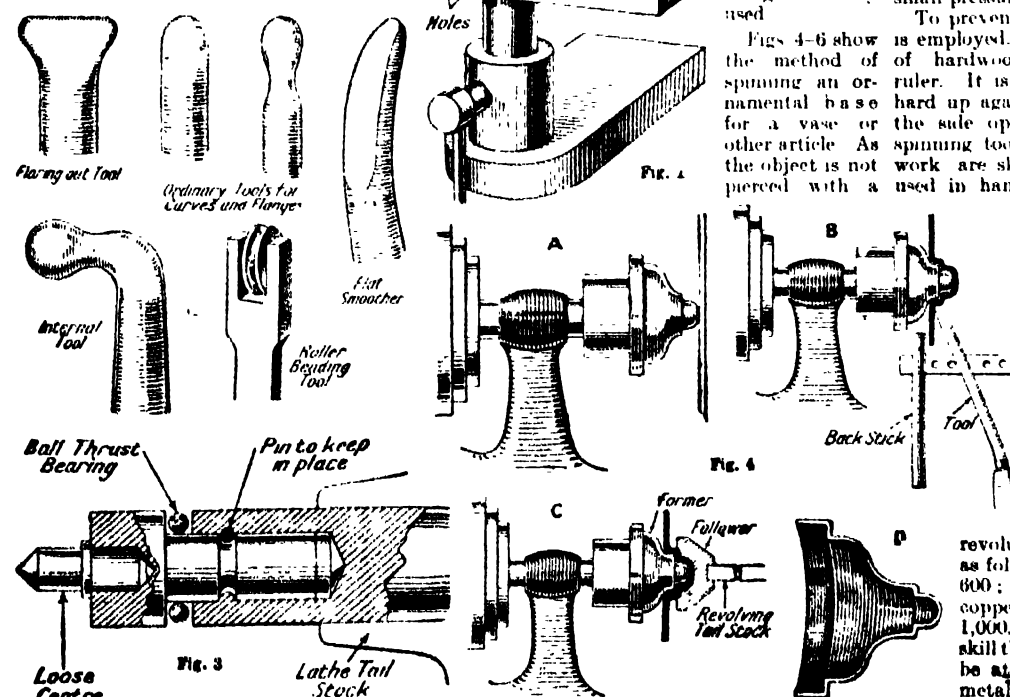
Fig. 5. Method of holding tool for first stage in spinning a bowl. Fig. 6. Disk spun over to shape

with a sweeping movement, continuing the stroke repeatedly. On the return stroke a small pressure is maintained on the work.

To prevent the disk buckling, a back stick is employed. This accessory is a short piece of hardwood, like an accountant's desk ruler. It is used in the left hand and held hard up against the rotating sheet metal on the side opposite to that upon which the spinning tool is operating. Rough edges of work are skimmed with a cutting tool, as used in hand metal turning. Internal work

needs hook tools. Roller tools are also employed. All tool points must be quite hard and highly polished, like metal burnishers. Each job requires its own former. When the diameters of the job will not allow a solid former to be used, i.e. in spinning an object like a narrow-necked jar or a bottle, where the former would be imprisoned inside, split formers must be used.

Taking a diameter of 4 in. as an average size of work in metal spinning, the speed in revolutions per minute is approximately as follows: soft sheet iron $\frac{1}{2}$ in. thick, 600; thicker sheets, 400; zinc, 1,200; copper, brass and aluminium, 800 to 1,000. The work requires so much skill that only the simplest jobs should be attempted at first, using the softer metals like copper and aluminium. For any but the smallest work a power lathe is desirable. See Chuck; Face Plate; Lathe; Mandrel; Metal Work, etc.



Metal Spinning. Fig. 1. Tool rest for spinning lathe. Fig. 2. Necessary tools for the work. Fig. 3. Ball-bearing tail stock spindle. Fig. 4. Stages in metal spinning: A, disk in position; B, disk being shaped; C, follower in position; D, completed shape in section. The work is shown in progress in the photographs

METAL TURNING ON SMALL LATHES

The Tools and Their Use in Various Operations

This contribution deals briefly yet comprehensively with the main processes in metal turning. Lathes suitable for the amateur are described and illustrated in the article *Lathe*. See also *Metal Spinning*; *Metal Work*, etc.

The process of removing the surface of metal in a lathe is known as metal turning. The object is attached to a rotating spindle, technically known as a mandrel, and a cutting tool is applied to the revolving work so as to produce the required shape and size with a degree of accuracy hardly obtainable in any other way. The tool may be fed up by hand, or in a sliding screw-feed tool fixing, known as a slide rest. For hand turning in metal it is of the greatest importance that the tools should be long and have handles of adequate length and stiffness.

To obtain the maximum power over the work, the heel of the tool should be supported by the rest, the adjustable bar near to the revolving work on which it is held during the operation, well under the cutting edge, as shown in Fig. 1. The tool should be gripped firmly and especially where iron or steel is being operated upon, the handle of the tool should receive a further support by resting in the hollow of the operator's shoulder. It will tend to lift at the handle, and if not resisted this will result in the tool getting jammed between the work and the tool rest, very possibly spoiling the one and breaking the other.

The heavier jobs in metal turning are not usually set out to be accomplished by hand where a modern slide rest lathe is available. Hand turning of this character requires years of practice and great strength of wrist. When work must be done by hand the cutting must be obtained by rolling the tool on its heel, so that the point enters the metal with the cutting edge at an angle to it.

Lighter work on the softer metals, such as brass and aluminum alloys can be operated

trated in Fig. 2. A second implement, the side tool (Fig. 3, b), has a cutting edge on its left-hand side; it may have a counterpart made to the opposite hand. The pointed or graver tool, shown at c in Fig. 3, is another useful hand tool.

For brass work, the nose and side tools should have flat tops, as shown in Fig. 4. For turning iron and steel a top rake is necessary (Fig. 5), to obtain the best cutting effect. A pointed hand tool is extremely useful in

producing a centre pop in a piece of work revolving in a chuck, preparatory to drilling it with the drill held against and fed up by the tailstock. In producing such a centre pop, the difficulty is getting rid of the pip which so readily forms in the centre of the sinking. A sharp tool is therefore essential. Why this pip forms will be readily understood when it is remembered that the absolute centre is not moving at all, and that the metal around it is only moving with a slow-cut-

ting speed. The thin spike or pip, being frail, is easily broken off.

Where the tailstock of the lathe can be brought up to the work, has a suitable chuck fitted to it, and is sufficiently stiff and accurate in alignment, a special device known as a centre drill may be used. This is, however, a matter of appliances; the mechanic should be able to produce the centre by hand.

Use of Chucks. Work to be turned can be held in the chuck. The self-centring chuck is the most commonly used appliance for holding any kind of work which in itself is reasonably round. The three jaws in this type of chuck all move together radially, either towards or from the centre, according to which way the operating key is rotated. The jaws are of two patterns, outside and inside, both sets being supplied with the tool. The outside jaws are used to hold rings and disks for facing, boring, as in Fig. 6, or turning portions which are clear of the jaws. With the inside jaws, a hollow bush can be held by the internal bore, and the outside operated on almost completely. The inside can only be machined for a part of the way. The presence of the jaws of the chuck gripping the work inside tends to prevent deep boring.

The inside jaws are generally in place, because their function is also to hold small diameter rods, drills and spindles on the outside. A self-centring chuck is only approximately accurate. For example, if a hollow bush is bored truly cylindrical on the inside, is then removed and replaced in the jaws of the chuck from this bore, and turned up outside, the outside and inside will not be concentric to a degree desirable in anything but rougher work. Independent chucks in which the four jaws are separately operated by screw keys are therefore used. The work can be tested and adjusted during the fixing up in

the chuck and greater accuracy obtained. Work may be bolted to the face plates with the part of the work to be operated upon clear of the holding-on bolts, as in Fig. 7. Here again the method of securing will depend upon the shape of the work. If it is not symmetrical the part out of balance must be counterweighted by bolting a suitable piece of metal on the opposite side. The alternative is to swing the job on centres which is usually the method adopted for turning pins, bars, and shafts. Fig. 8 shows this arrangement.

The Mandrel. In employing the slide rest, the correct choice of methods in holding the work is as important as the actual turning. The turning of a disk absolutely true with a hole bored in its centre is not usually accomplished in a chuck. The work after boring is mounted on a mandrel, i.e. a bar previously centred and turned true on centres. It follows that, the mandrel being true, a greater degree of accuracy can be obtained than by holding the work in a chuck and adjusting it until it appears to run true.

Standard-sized mandrels can be obtained ground truly cylindrical to a high degree of accuracy. To provide for slight variations in the diameters of the holes to be accommodated, expanding mandrels, which are made to grip the work by screw-pressure, are provided. Mandrels should not be used for heavy jobs unless they are strong enough to do the work without springing.

Roughing down a mandrel is illustrated in Fig. 9. The rough bar is held between centres, driven by a carrier and cut with a swan-necked tool fixed in the slide-rest tool holder. To allow long mandrels and pins to be turned slightly taper and also to adjust parallel turning to a high degree of accuracy, most of the better lathes are fitted with a set over arrangement on the tail stock. The centre of

the latter can then be moved across the bed to alter the alignment in relation to the bed.

Internal Work.

Internal turning, or boring, as it is termed, is accomplished by placing a hook tool in the holder longitudinally, as in Fig. 6. The feed-in, which increases the internal diameter of the work being operated on, involves a reversed movement of the slide-rest handle. Where it is essential that the bore of an object shall be quite true with its external diameter, it is necessary to perform both the internal and external turning operations while the work is fixed in the chuck. This has been done in the case of the piston illustrated in Fig. 8. The casting is held in the chuck by a spigot, or tenon piece formed on its head, which is afterwards

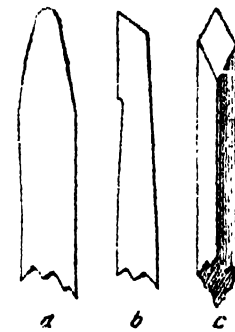


Fig. 3. Types of hand turning tools: a, round nose; b, side tool; c, graver or diamond point.

movement of the slide-rest handle. Where it is essential that the bore of an object shall be quite true with its external diameter, it is necessary to perform both the internal and external turning operations while the work is fixed in the chuck. This has been done in the case of the piston illustrated in Fig. 8. The casting is held in the chuck by a spigot, or tenon piece formed on its head, which is afterwards

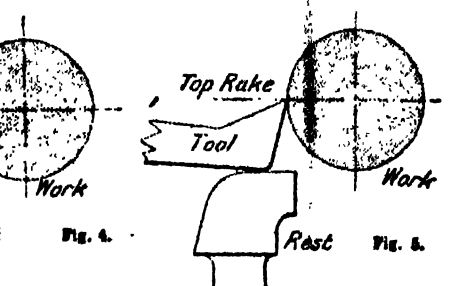


Fig. 4. Diagram showing use of flat-topped tool for brass work. Fig. 5. Use of top rake for turning iron.



Fig. 2. How to hold a metal turning tool when skimming up a projecting portion of the work.

on with much less fatigue. The tool can be held as illustrated in Fig. 2. Skimming up a projecting rim with a hand tool, as here shown, is a quick and easy method of producing the desired result. There are many other similar operations, as, for example, the making of an odd-shaped knob, or producing a curved, conical object like a water jet, which would prove troublesome to produce singly on a slide-rest lathe, but can be made quickly and accurately with a hand tool, using a shaped template in thin card or metal as a guide to form and size.

Types of Tool. Among the most useful hand tools for a metal-turning lathe is the round nose tool shown in Fig. 3, a. This cuts at the side to a certain extent, as well as in the front, hence its being used for the job illus-

sawn off. Where such an operation is impossible it is usual to bore the job out accurately, and then to remove it from the lathe. A turned mandrel is made to fit the bore tightly, and the outside operations are accomplished with the work on this true mandrel.

In feeding the tool, regularity of rotation of the hand wheel on the end of the screw should be observed. The knack of operating the feed handles with an even motion is soon obtained. Every lathe has its peculiarities. Where handles are fitted to the feed screws, the fingers and thumb alternate in propelling the screw. With a wheel, a slightly different manipulation is required, the rim of the wheel being grasped by the hand. The tool should always be kept moving slowly but evenly; if it proceeds in jerks, the work will show rings.

All screw-cutting lathes can be arranged to obtain a self-acting traverse. The lead screw which operates the sliding saddle should be connected up with a train of change wheels to give one of the finer rates of feed, i.e. 100 to 200 turns to the inch. With the self-acting feed, very fine finishes can be obtained without effort.

Screw Cutting. In screw cutting, the saddle of the lathe is traversed along the bed with a rate of feed which bears a pre-determined proportion to the revolutions of the mandrel. The lead screw which guides the saddle tool holder is coupled by a train of gear wheels. These may be altered in ratio as desired. Assuming a lead screw with $\frac{1}{16}$ pitch:

If the ratio of gears on the change-wheel quadrant is altered, say, by coupling a 20-tooth change wheel on the mandrel with a 60-wheel fixed on the end of the lead screw, that is, in a proportion of one to three, then the lathe will produce three times 10 pitch, or a screw of 30 threads to the inch, on the job rotating in the lathe. Change wheels for all the usual threads are supplied with screw-cutting lathes. Odd sizes are sometimes obtainable.

Short threads can best be produced on a foot lathe by taking definite cuts along the threaded portion, stopping the lathe at the end, withdrawing the cut on the top slide rest, running the lathe backward, and advancing the cut, proceeding through the same cycle of operations without releasing the lead screw. For longer threads, the lead screw is declutched at the end of the cut, and the saddle and slide rest traversed back by hand. The proper re-engagement of the clutch or lead screw nut may require the chalk marking of the work and the change wheels, to prevent a cross-threading cut being taken. Fig. 10 shows a screw thread that is being cut on the end of a pin supported between the lathe centres.

Hand chasing, or screw thread chasing, bears the same relation to screw cutting as hand tool work does to that requiring the slide rest. Its successful use is largely a matter of skill. It is also more usually employed in dealing with brass work and for the finer threads, such as

32, 28, 26, 19 threads per in., standard sizes for pipe work. The chaser is a hand turning tool with a cutting edge in the form of a screw thread of the particular pitch it is desired to obtain. With the work revolving, not too quickly, the hand chaser is struck in with a lateral sweep. Milling, drilling, and dividing, also the formation of scrolls, worms, and gear teeth, may be accomplished in the lathe, by the addition of suitable fitments and accessory devices.

Cutting Speeds. The cutting speeds for various metals differ. The term cutting speed must, however, not be confused with the rate of feed. The latter is dependent on the size and power of the lathe being used. Cutting speeds are the same for any lathe. Wrought iron and steel should be turned at from 200 to 300 in. per minute, tool steels at 200, cast iron at 190 to 200, soft gunmetal at 500 to 600, and brass at 800 in. The speed is found by multiplying the revolutions of the lathe mandrel by the circumference of the work. A piece of work in cast iron, 1 in. in diameter and approximately $3\frac{1}{2}$ in. in circumference, should therefore run at from 60 to 65 revolutions per minute.

With the average foot lathe it is difficult to get a high enough speed in turning small brass work, and one low enough for a large diameter cast-iron object, and therefore a certain degree of compromise in the matter of speeds has to be accepted. Cast iron, brass, and gunmetal are not lubricated in turning operations, but to obtain a good finish on wrought iron and steel requires the use of oil, or any saponaceous solution.

METAL WORK. This term includes all the mechanical processes for the fashioning of metal. Practically speaking, all metals are worked in one of four ways: the metal is cast, rolled into sheets and bars, drawn into tubes, or extruded. Castings perhaps the first of the metal working processes, as it utilizes the metal practically in the raw state. Briefly, the process consists in making a pattern or mould of the shape of the

desired casting, and impressing it into damp sand, thus making a hole or cavity which is subsequently filled with metal. The casting is afterwards finished by machining in a lathe, or it may be milled.

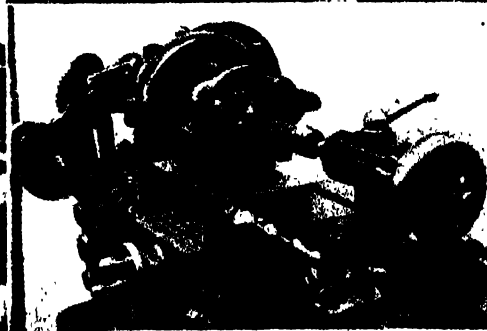
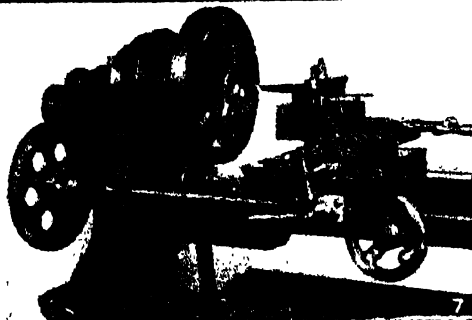
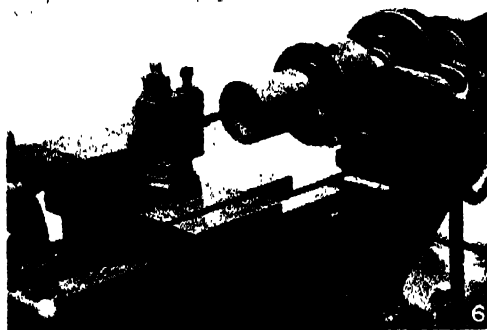
Ordinary sheet or bar metal has generally to be cut to something approximating to the desired length or size, and this is done by sawing with a hack saw or cutting with cold chisels. Metal work that calls for many joints introduces soldering and brazing, both of these being accomplished by melting another but softer metal than that to be united, and flowing it into the joint between them. In some cases welding is necessary, particularly when dealing with iron and steel. Heavy pieces of metal that cannot conveniently be shaped in other ways are often fashioned by forging. Sheet-metal work generally calls for a knowledge of rivets and riveting.

Hammers for metal work do not differ materially from those used by other trades, and may range from a light-weight riveting hammer to a heavy sledge hammer for fashioning thick pieces of metal while hot, and for delivering heavy blows in general. Files are very necessary in all classes of metal work. The average size is generally between the ranges 6 to 10 in. in length, and varying from a smooth to a coarse cut.

Drills of all kinds are necessary for making holes in metal, and are made in all sizes from something under $\frac{1}{16}$ in. upward in diameter. To rotate these drills, a hand drilling machine is convenient up to about $\frac{1}{2}$ in. diameter. Above this size, however, a treadle apparatus or a powerful bench-drilling machine will be found necessary.

A vice of some kind is essential in metal working, and should be sufficiently robust for the class of work normally undertaken. A small vice can only be suitable for small work, but for heavier work a good substantial bench vice is necessary. Another useful metal working tool is the grinder, and comprises a variety of different types.

All manner of turning and shaping processes on metal can be carried out with the lathe. Numerous appliances and tools are used in conjunction with it. Cold chisels form an important group of metal-working tools, and while they are inexpensive, they are capable of much useful work in the chipping out and cutting of sheet and bar metal. Smaller tools include punches, used for riveting and for making indentations.



Metal Turning. Fig. 6. Internal boring, showing work held in a three-jaw chuck. Fig. 7. Face plate work, showing a small piece of work clamped to plate. Fig. 8. Rod mounted and driven between centres. Fig. 9. Roughing down a mandrel, a swan-necked tool being used in the slide rest. Fig. 10. Screw cutting in a lathe.

METER. Apparatus that records automatically the quantity of a gas, fluid, or electric current passing through it. Such meters are used for measuring the amount of gas, electricity, and sometimes water, used in a house. Some electricity and gas meters are worked by the insertion of coins, a penny or a shilling providing a certain amount of light or power, which automatically fails when the quantity is exhausted. See Electric Light, Gas, Water.

METHYLATED SPIRIT. Alcohol which has been rendered unfit for use as a beverage by a process of denaturising is sold as methylated spirit and has uses in the home. It must, however, always be most carefully handled owing to its highly inflammable nature. Naphtha and petroleum or paraffin are the agents commonly used for denaturising, together with a trace of blue aniline dye. The sale of methylated spirit is regulated by law, and vendors must have a licence.

Methylated spirit is used for heating small stoves which contain an absorbent substance, such as asbestos fibre. In filling the stove only as much spirit should be added as can be absorbed. It is dangerous to add a surplus of spirit, as when lighted the flame might overflow from the stove or lamp and cause a fire.

For glass cleaning there are few things to equal methylated spirit: it is invaluable for polishing wide surfaces of glass, such as wind screens, table tops, or the glass covers sometimes inserted in polished trays. It is equally efficacious for windows, but is too expensive for the ordinary householder to use in large quantities. For small things the quantity needed is not excessive, and is well worth the outlay. A few drops on a soft cloth are generally sufficient. A little methylated spirit put in the water when rinsing white silk blouses gives gloss and firmness. Applied to brown boots the spirit removes stains and produces a fine polish. As it tends to dry up the leather, it should only be used occasionally.

For various medicinal and surgical purposes methylated spirit is of great use. If, for example, it becomes necessary to sterilize bowls or other utensils quickly and there is no time to boil them, a little of the spirit may be poured in and lighted, and when it has burnt itself out the bowl will be ready for use. Lancets or similar small instruments may be stood in methylated spirit for half an hour and are then completely sterilized. For preventing bed sores or any other form of chafing methylated spirit should be rubbed on, and the area powdered. This applies also to tender feet, or to hands which blister easily when doing unaccustomed work. Finally, it makes an excellent lotion for sprains or bruises, when added to water and applied as a compress.

METOL: The Developer. Metol is a photographic developer which gives thin, delicate negatives with full detail but little density. It is rapid in action, and is best used with a slow developer, such as hydroquinone. Metol is frequently used with pyro, the combined developer being known as pyro-metol.

The following is a formula for one-solution plain metol developer:

Metol	..	..	75 gr
Sodium sulphite (crystals)	..	..	14 oz.
Sodium carbonate (crystals)	..	..	12 oz.
Potassium bromide	..	..	8 gr
Water to make	..	..	10 oz.

For ordinary use take 1 oz. of the above solution and add 2 oz. of water. For portraits, add 1 oz. of water to each oz. of the stock solution.

In all developers containing metol the metol should be dissolved first, then the sulphite, followed by the other chemicals, using warm, but not hot water. The Watkins factor for metol is 30.

With some persons metol has an unpleasant action on the skin; the skin cracks and the

fingers swell, resulting in broken nails and sores, which may spread to other parts of the hands. In such cases the use of the metol developer should be abandoned, though the risk of poisoning may be greatly, if not entirely, obviated by the use of rubber gloves. The poisoning may be treated by soaking the hands in warm water and rubbing in zinc ointment, using bandages or gloves at night. The following ointment will cure the sores.

Lithyal	..	..	..	..	1 part
Lanoline	..	..	..	..	1 part
Boric acid	..	..	..	..	1
Vaseline	..	..	..	..	3

If a metol developer has to be used the hands should be washed frequently in clean water while at work, and afterwards washed thoroughly with warm water. See Developing Pyro.

METOL-HYDROQUINONE. An excellent developer for general use is metol hydroquinone, usually referred to as M.Q., and suitable alike for films, plates, bromide, and gaslight papers. It combines the advantages of both developers, giving the detail rendering of metol and the density and contrast of hydroquinone. If properly made up it is clean-working and non-staining. The full quantity of sulphite given in the formulae that follow must be used. A good one solution M.Q. developer is as follows:

Metol	..	..	..	20 gr
Sodium sulphite (crystals)	..	..	..	1 oz
Hydroquinone	..	..	..	20 gr
Sodium carbonate (crystals)	..	..	..	10 gr
Water to make	..	..	..	10 oz

Dissolve these in the order named, using warm (not hot) water. For use take equal parts of the solution and water. It should only be made up when wanted, and used fresh. A two-solution which will keep is made up thus, using equal parts of A and B:

SOLUTION A				
Metol	..	..	..	20 gr
Sodium sulphite (crystals)	..	..	..	60
Hydroquinone	..	..	..	20
Potassium bromide	..	..	..	8
Water to make	..	..	..	10 oz

SOLUTION B				
Sodium carbonate (crystals)	..	..	..	1 oz
Water to make	..	..	..	10

The Watkins factor for M.Q. made as above is 14. M.Q. is a very suitable developer for all-round use by the amateur. As long as it is properly made up, used fresh after preparation or dilution from stock solution, it is always to be relied upon.

Developers containing hydroquinone cease to act almost entirely when the temperature falls below 60° F. If the M.Q. developer cannot be kept well above this temperature in winter it is desirable to increase the metol in the two-solution formula above to 30 gr and reduce the hydroquinone to 15 gr. It is, of course, useless merely to warm the developer and its dish, as it will quickly take on the temperature of the dark room. See Developer: Developing: Hydroquinone.

METRE. This common measure of length is the unit of the metric or decimal system. It is equal to 39.37079 in., or about 3 in. more than a yard. It is divided into decimetres (10), centimetres (100), and millimetres (1,000). The following table gives the equivalents of metres in yards.

Metres	Yards	Metres	Yards	Metres	Yards
1 = 1.093	8 = 8.748	60 = 65.616			
2 = 2.187	9 = 9.842	70 = 76.552			
3 = 3.280	10 = 10.936	80 = 87.488			
4 = 4.374	20 = 21.872	90 = 98.424			
5 = 5.468	30 = 32.808	100 = 109.360			
6 = 6.561	40 = 43.744	200 = 218.722			
7 = 7.655	50 = 54.680	400 = 437.444			

The Metric System. The metric or decimal system of weights and measures is a French invention, but is used to some extent in Great Britain. It aims at uniformity and simplicity, features which are wanting in the system that has grown up in haphazard fashion in England. The alternative name, the decimal system, is

due to the fact that it works in tens (deca, ten), simplifying calculations.

The fundamental unit of the system is the metre, a measure of length, and from it the other units are derived. The gram, which is the unit of weight, equals the weight of one cubic centimetre of pure water at its maximum density. The unit of capacity, the litre, is equal to the volume occupied by 1,000 cubic centimetres of pure water of maximum density. From these the other weights and measures are derived. The Greek words, kilo, hecto, and deca mean 1,000, 100, and 10, a kilogram being 1,000 grams and a decalitre, 10 litres. For small quantities the Latin words milli, centi and deci are used, a millimetre being $\frac{1}{1,000}$ part of a metre and a centigram $\frac{1}{100}$ part of a gram. The capital letters K, H, and D are used for the multiples, and small letters m, c, and d for the weights and measures that are less than a unit. Kg., therefore, represents kilogram; Km., kilometre; and Kl., kilolitre; mg represents milligram, cl., centilitre; and dm., deci metre. The word myria (M) is used to represent 10,000.

In addition, there are special units for square or superficial measure. For instance, 100 square metres equal an are, and 100 ares equal one hectare. In the case of areas the multiples change by 100, not by 10 at a time, and in the case of volume, or cubic measure, they change by 1,000. Below are some of the metric weights and measures and their English equivalents:

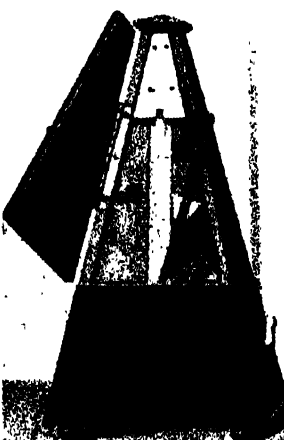
1 metre	= 39.37079 in.
1 kilometre	= 1,000 m., or 3,281 ft.
1 sq. kilometre	= 247.17 acres
1 gram	= $\frac{1}{28.35}$ grains
1 kilogram	= 2,204.62 lb.
1 litre	= 1.76 pints

METRONOME. A metronome is a device enabling a composer to indicate with precision the speed at which he wishes his music to be performed. It is based on the principle of the pendulum, which differs, however, from that of a clock in being weighted at both ends, and in oscillating from the centre instead of from the top.

The weight upon the upper part of the rod is made to slide up or down so as to rest against certain figures engraved thereon. The figures begin at 40 or a little more at the top of the rod and progress down at intervals by two's to 60, after which they go on by three's to 72, then by four's to 120, next by six's to 144 (where some metronomes finish), and finally by eight's to 208.

The position of these figures is calculated in proportion to the heaviness of the fixed weight on the lower part of the rod, so that on the movable weight being placed against

any given figure, the pendulum will swing that number of times in a minute. Consequently, all the composer has to do is to indicate the value of the note which represents the pulse or beat of his music and then to give the necessary figure. In the great majority of cases the crotchets, either plain or dotted, is the



Metronome. Device for indicating speed at which music should be performed.

Courtesy of Hawkes & Son

unit of speed, though the minim and the quaver are occasionally used $\text{♩} = 60$ therefore means that the music is to move at the rate of 60 crotchets per minute.

There is more than one kind of metronome. That known as the Maelzel is wound up like a clock, the mechanism being contained in a wooden case of pyramidal shape, and when the rod is released it oscillates, ticking at each swing. Sometimes there is a bell attachment, which can be adjusted so as to strike at regular periods. The Pinfold metronome has no clockwork. It swings silently on two steel points balanced on a tripod, and is set in motion by the finger. Both of these are on the double pendulum principle.

Another kind consists of a circular case containing a tape measure, which can be unwound to any given point and swung from the hand, the case forming the weight. When not in use it can be coiled up by touching a spring, and carried in the pocket. It is handy for an emergency, but is open to the objection that it cannot be in action simultaneously with musical performance.

The use of the metronome is to ascertain the general speed of the music; it should not be employed throughout a piece, except in very stubborn cases of faulty time, which it may help to correct.

MEZZANINE. This term is used in architecture to describe a storey or floor introduced between two principal floors, thus forming one small room within a larger one, lighted by a large window or windows which give light to the mezzanine floor and the other part of the floor beneath it. The arrangement of the mezzanine floor is largely governed by the architecture and plan of the building as a whole.

MICA. A mineral of complex and variable composition, mica is used in domestic work for windows for anthracite and other heating stoves and for all purposes where translucence is desired and great heat has to be resisted. It is characterized by easy cleavage in a single direction, and may be divided to very thin sheets. When used in front of a stove it is generally about $\frac{1}{8}$ in. thick.

Mica can be purchased from any good glass and glazier. It is generally stocked in various sizes and shapes, and a size most appropriate to the job in hand should always be selected. If due care be exercised it can be cut to shape with a strong pair of scissors. See Stove.

MICE: How to Destroy. Both poison and traps are employed to destroy mice, but there is no more efficient remedy than to keep a cat in the house. Where no cat is kept mice appear sooner or later. Very often what attracts them, even where there is a cat, is a plentiful supply of food in the shape of bread crumbs, scraps of cheese, or other fragments, or seed from bird cages, left lying on floors or tables or shelves of cupboards.

The first precaution to be taken, therefore, is to see that all these tempting morsels for mice are carefully swept up, and cheese, sugar, grain, bread, etc., covered up, especially at night. Where poison is resorted to only small quantities should be employed, not in any case larger than a small haricot bean. Great care must be taken to prevent food from coming in contact with preparations sold for killing mice, as these usually contain phosphorus, strychnine, or arsenic.

An effective method is to bait cheese or bread with barium carbonate. After the poison has been laid all the holes should be stopped up, and a good material to use for this purpose consists of equal quantities of barium carbonate and dripping, made into a paste. The mice usually eat the poison in trying to nibble their way out. Whenever a mouse hole has been treated in this way a piece of paper may be pasted over the hole as a safeguard for pets.

Mouse Trap. The simplest pattern of mouse trap in use consists of a small piece of flat wood on which is fixed a powerful spring which operates a square-shaped wire. After the trap is baited the wire is pushed back and held by a catch, one end of which is inserted in a piece of metal on which the bait is laid. The slightest movement of the bait causes the catch to be released, and the sharp recoil of the wire, due to the spring, instantly kills the mouse. This break-back trap has almost entirely superseded the old-fashioned box trap, with wires, which closed on the mouse when it nibbled the bait. Either toasted cheese or a scrap of fat bacon is the customary bait employed, and the trap can be kept clean by being occasionally plunged into boiling water.

MICE: As Pets. Of the smaller animals that are kept as pets white or mottled mice give the least trouble. They should be purchased when quite young. For food the mice are given warm bread and milk, dry breadcrumbs and stale cake, dandelion and lettuce leaves, pieces of apple and carrot, and mixed bird seed. They should be kept in a glass-fronted and well-ventilated wooden box, in a perfectly dry and quiet place, away from direct sunlight.

The cage must be kept perfectly clean, and it is an advantage to have two cages in order that one may be in use while the other is being cleaned and dried.

A convenient cage for mice is easily made from $\frac{1}{2}$ in. wood and a few lengths of stiff wire. The base is 15 in. by 5 in., the fixed cage 10 in. long by 10 in. high, and a revolving wheel is formed from two 5 in. disks joined by 4 in. lengths of wire. The fixed cage is divided into two parts. One, 4 in. wide, is closed with a plain door, the other has a barred door formed by lengths of wire driven into strips of wood, both are latched by nails driven in through the top and bottom pieces. These 4 in. holes are bored in one disk and a similar hole in the end of fixed cage, and the revolving portion is hung so that the holes will coincide. The rod supports of the cage are 2 in. by 5 in. wire cut from corners, and are joined with a 1 in. strip.

MICHAELMAS DAISY. This is the popular name of the hardy perennial aster, an important group of autumn flowering plants. They thrive in ordinary well-cultivated soil and are increased by division in spring. They may be planted in autumn or spring. In the course of two years the plants form large clumps and must then be lifted, divided and replanted. The finest blooms of this plant are obtained by replanting small pieces in spring and setting several together in groups.

In recent years many beautiful new varieties having richly coloured flowers have been introduced. Of the large-flowered varieties some of the best are Beauty of Borsdorf, lilac mauve; King George, violet-blue; Perry's Favorite, rose; and Preziosa, violet blue. These grow about 2 feet high and bloom in September.

Barr's Pink carnation rose, 4 $\frac{1}{2}$ ft.; Beechwood Challenge, red, 4 ft.; Anita Ballard, lavender-blue, 4 $\frac{1}{2}$ ft.; Beauty of Colwall, lavender blue, 4 ft.; Ethel Ballard, pale pink, 4 ft.; Maid of Athens, pink, 4 $\frac{1}{2}$ ft.; Moss, rose, 4 ft.; Mrs. George Moore, white, 4 ft.; and Peggy Ballard, mauve, 3 ft., these bloom in September-October.

Climax, lavender-blue, 5 ft., and its white variety, dba, are handsome October flowering varieties. Little Pink Lady and Little Boy Blue are two charming large-flowered varieties, 2-3 ft. high, which bloom in September. Aenis, 2 $\frac{1}{2}$ ft. bears a profusion of small lavender-blue flowers in August; Blue Star and Silver Gem yield dainty sprays of small flowers in September-October. Michaelmas



Michaelmas Daisy. Purplish lilac flowers of a tall free blooming variety

daisies can be raised from seeds sown in boxes of soil in a frame in spring.

MICROBES. The word microbe is applied to microscopic living things, animal and vegetable, particularly the latter. They are of various shapes, some being globular (cocci), some like straight rods (bacteria), some wavy, some curved (spirilli). Most microbes are harmless to man; many are very useful, as, for example, those which produce vinegar, the ripening of cheese, the nitrification of soil, etc. Other microbes are the cause of many of the more serious infectious diseases which afflict mankind. See Virus.

MICROMETER. As a precision measuring instrument the micrometer is generally used in metal work, but it is applicable to the measuring of any material where extreme accuracy is called for. The principle of the micrometer is based on a screw calibrated so that readings of 1/1000th of an inch, or even finer, can be taken directly.

The ordinary type of micrometer is illustrated in Fig. 1, and comprises a U-shaped body. At one end is a circular projecting portion called a sleeve, which has a screw thread cut in a portion of its length. In the type of instrument to which the following description applies the pitch of the threads is 40 to the inch. Into the sleeve is screwed a spindle rotated by an outer portion called the thimble, which is milled to afford a sure grip. In some patterns this and the thimble are rigid, but in the Browne & Sharpe instrument, illustrated, a ratchet device is provided in the form of a subsidiary and smaller handle which is situated at the end of the thimble.

Its function is to rotate the thimble to open the jaws of the micrometer, but to close them with a pressure determined only by the amount of friction on the spring pawl of the ratchet. When the determined pressure between the measuring faces has been reached, the ratchet will slip and the screw cannot be turned any more. As a consequence of this, it is impossible to strain it. A locking device is provided in the form of a little milled ring, situated in the upper part of the frame. Thus, when rotated, grips the spindle rigidly, so that if the instrument is required to measure

several pieces of the same size, it can be locked and used as an ordinary fixed type of beam gauge.

The anvil is movable, and by means of the rubber nut at the end of the frame opposite to the sleeve it can be drawn back, to increase the measuring range of the instrument. The portion constructed can measure up to 2 in. in diameter with the anvil drawn back, and for objects 1 in. when the anvil is pushed forward. To set the instrument, the spindle is set at zero, the anvil drawn back, and a circular gauge is inserted between the end of the spindle and the anvil. The latter is then pressed into contact with the disk, and locked in that position

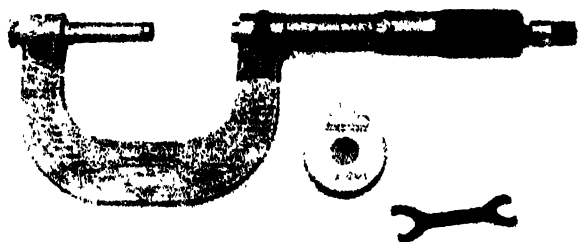


Fig. 2. Anvil drawn back and the gauge disk in position.

In use, the instrument is simply applied to the object to be gauged, the thimble rotated until the sleeve is almost in adjustment, and the reading completed with the aid of the ratchet handle. This drives the spindle into contact with the object to be measured. The same principle is applied no matter what the shape of the object may be, so long as the spindle and anvil can bear upon it. Supposing it to be a bar of metal $\frac{1}{4}$ in. in diameter, this reading would be taken in thousandths of an inch, as practically speaking all micrometers are calibrated in the same way, or else have metric readings.

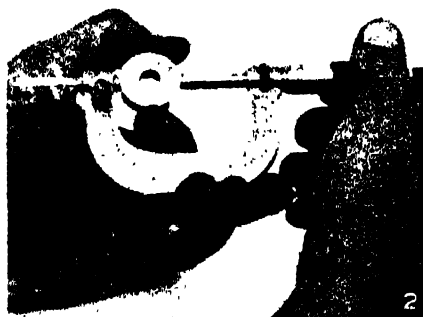
One must be taken that the metal to be gauged has a true and smooth surface; otherwise it will be impossible to obtain an accurate measurement. On the bevel edge of the thimble are series of lines and marks, beginning at 0, the next marked division being 5, and so on by regular steps of 5 up to 20. The zero mark will also be read as 25. There are thus 25 spaces or divisions around the edge of the thimble. On the sleeve is a series of numbers and division marks commencing at 0 and numbered consecutively to 9 and 0. There are thus 10 spaces, each subdivided into 4 spaces.

As the spindle is screwed, the thimble when rotated travels up and down along the sleeve, and, as it works outward, the marks on the sleeve gradually appear in regular order, 1, 2, 3, etc. The distance which is traversed by one revolution of the thimble is determined by the pitch, or number of threads per inch cut on the spindle, and, as this is 40, it follows that one revolution of the thimble draws back the spindle $\frac{1}{40}$ in. The divisions on the sleeve are spaced $\frac{1}{40}$ in. apart, and, being further divided into 4, one complete revolution of the thimble will draw it back exactly this amount, that is $\frac{1}{40}$ in. But as the rim of the thimble is divided into 25, if the thimble is only rotated to move through, say, one space on the thimble scale, the exact amount which the spindle has been drawn back will be $\frac{1}{1000}$ in., because the spindle has made $\frac{1}{4}$ of a revolution, that is $\frac{1}{4}$ of $\frac{1}{40}$ in., that is to say, $\frac{1}{1000}$ in.

All the readings are taken from the horizontal line marked on the sleeve and from the zero mark on the thimble. Consequently it is perfectly simple to measure $\frac{1}{1000}$ in., or any other number of thousandths. When

using a micrometer, it is better to think in thousandths than in any other figures. For example, $\frac{1}{2}$ in. is more quickly remembered as $\frac{500}{1000}$, and similarly with other fractions. Therefore, to measure the bar known to be $\frac{1}{4}$ in. in diameter, it is better to think of it as one inch, plus $\frac{1}{4000}$ which is exactly $\frac{1}{4}$ in. Measuring this will necessitate setting back the anvil, adjusting it to zero, and then unscrewing the thimble sufficiently to rotate $\frac{1}{4000}$. This will obviously require more than 4 revolutions, as each of these will be $\frac{1}{1000}$ making $\frac{1}{4000}$ in. all. Therefore rotate the thimble until the line marked 1 is visible when the zero on the thimble scale is exactly opposite the horizontal line. This is $\frac{1000}{1000}$ and the thimble is then rotated to add the remaining $\frac{1}{4000}$.

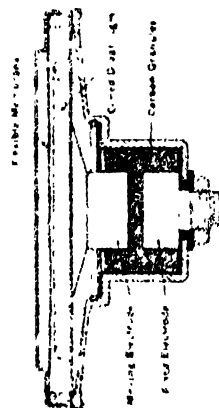
Fix the spindle in this position, and apply it to the bar. The jaws should just go on to it smoothly and certainly, but without forcing, and without the least trace of slackness. Suppose it will not quite go on, as the bar is, say, a few thousandths over size



Micrometer. Fig. 1. Complete instrument with adjusting spanner and gauge disk. Fig. 2. Setting micrometer with inch gauge disk.

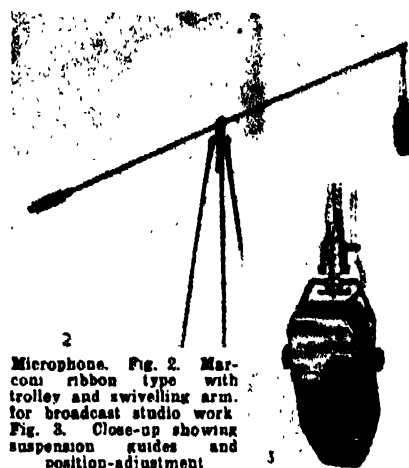
Release the clamp and then further unscrew the thimble, counting in a number of spaces on the thimble scale which pass the zero line on the sleeve until the spindle has been drawn back sufficiently to fit on to the bar. Suppose that this is 7 spaces. This means $\frac{7}{1000}$ in., and thus the true reading is 1.132 in. In actual practice the readings can be taken direct by simply reading off the scale, counting the numbers of thousandths as explained above. See Gauge; Limit Gauge.

MICROPHONE. The microphone is in reality the part of the human ear. In the ear the sound waves strike the eardrum, or



Microphones. Fig. 1. Contact type in telephone.

ally to the brain. An electrical microphone has a diaphragm corresponding to the eardrum. The oscillation alters the number and pressure of a series of contacts in an electric circuit, thus varying the electrical resistance and the strength of the current. The electricity is normally flowing steadily, but the current is altered by the vibrations of the voice. These



Microphones. Fig. 2. Marconi ribbon type with trolley and swivelling arm, for broadcast studio work. Fig. 3. Close-up showing suspension guides and position-adjustment. Courtesy, R.C.C.

current variations are then converted back into mechanical vibrations to give speech. The microphone, which forms part of the ordinary telephone, is shown in section in Fig. 1.

The broadcasting microphone is the first link in the transmission chain. The sound waves in the broadcasting studio are picked up by the microphone, which converts them into electrical currents. These currents are then amplified and caused to modulate the carrier wave sent out by the broadcast transmitter. Microphones are also used in conjunction with public address amplifying systems. See Carrier Wave; Modulation; Telephone.

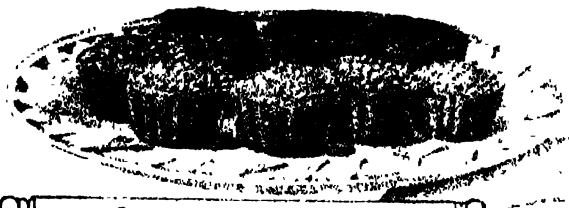
MICROSCOPE: Its Mechanism. When choosing a microscope the essentials specified below should be borne in mind. As good an instrument as the purchaser can afford should be bought, since a pound or two more on the price will add a great deal to the scope and utility of the microscope. Several firms stock second-hand microscopes, and can usually be relied upon to furnish a satisfactory instrument at a moderate price. What are known as student's instruments are turned out by leading opticians at quite low prices, and the stands embody the essential qualities desirable in a microscope for ordinary use.

The chosen instrument should be of good workmanship, rigid, firm, and free from vibration, whether it is being used in an upright, horizontal, or sloping position. All movements should work smoothly, at the same time being free from such defects as slipping. The lower priced stands are generally of the vertical or non-inclinable type. The coarse adjustment should be a rack and pinion movement, and the fine adjustment should never depend upon the direct action of springs.

A stand with a rack and pinion adjustment is preferable, even if this is the sole means of focusing the instrument. With a good coarse adjustment alone objective glasses up to $\frac{1}{4}$ in. can be focused.

The stage should be rigid, and large enough to afford a safe support for any glass vessels the contents of which may have to be examined. The stage should be provided with spring clips, removable at will, to secure the glass microscope slides, usually 3 in. by 1 in. in size.

The best form of diaphragm is the iris pattern, similar to the arrangement for stopping down a camera. This diaphragm is necessary, since the light has sometimes to be cut down or increased, and forms part of the sub-stage condenser, or that part of the instrument found under the stage. The function of the latter is to collect into a cone of large aperture the beam of light rays reflected by the mirror. This is achieved by means



Nougatine

See p. 847



Olive Savouries



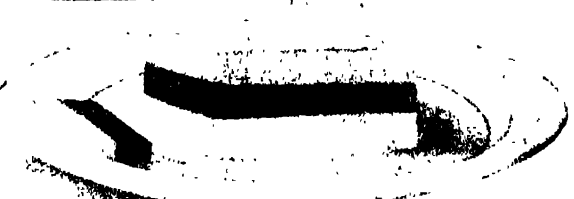
Orange Layer Cake

See p. 863



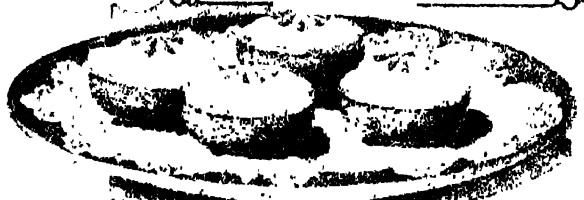
See p. 845

Noodle Savouries



Neapolitan Ice

See p. 832



Orange Cream

See p. 863



Orange 'Baskets'

See p. 863



Orange Trifle

Norfolk Pudding

'N' AND 'O' RECIPES - A SELECTION IN ACTUAL COLOUR

Orange Trifle. - Put 6 sponge cakes, spreading cut side with marmalade. Arrange lower halves in glass dish. Pour 1 pint milk. Pour some over cakes and add 1 pint orange juice. Sprinkle over the grated rind of a large orange. Put it on top halves and soak with remainder of milk, 1 pint wine, and strained juice of the orange. Peel another orange, trim. Cut peel into fancy shapes and divide fruit into quarters. Remove ribs and arrange slices between the sponge cake. Separate yolks from whites of two eggs. Beat up yolks with another whole egg, adding 1 pt. milk, 1/2 dessertspoonful and a few pinches orange rind. Pour all into a jug. Stand in hot water over a foot, stirring until contents thicken, but not boil. Take out rind and leave custard to cool. Decorate sponge cakes with frosted almonds. Pour custard covering the whole with white of 2 eggs whipped to stiff froth and mixed with 1 lb. superfine sugar. Decorate with crystallized violets and the cut orange peel. *Norfolk Pudding*. - See p. 845 for recipe. For pudding, brown at once a very rich batter, seasoned to taste. Add by degrees 1/2 pt. cream and 1/4 pint wine, 1 table spoonful orange-flower water. Fill buttered pudding cups half full and bake until in each lot 10 min. For Orange Souffle, see Souffle Menu on



Odontoglossum Henry VII



Coelogyne cristata



Odontoglossum crispum



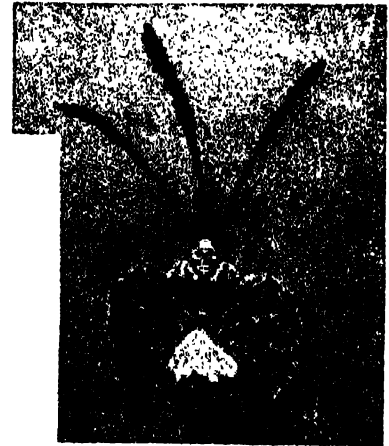
Cypripedium Germaine opois



Odontocla Zenobia



Laelia cattleya St. George



Oncidium papilio



Dendrobium acrostichum



Odontoglossum grande

ORCHIDS - VARIETIES FOR THE AMATEUR

General description of the orchids and culture of orchids in an amateur's greenhouse are given in p. 864

Good examples of orchids are given in Howard's Heath

of a short-focus system of lenses, and the aperture can be reduced at will, by means of the diaphragm. The mirror below the condenser is reversible, one side being plane, and the other concave. The plane mirror is generally used, but the concave side should be used when working with low powers.

The choice of eyepieces and objectives is governed by the class of work it is desired to undertake. A pair of eyepieces, magnifying the image formed by the objective 5 and 9 times respectively, and two objectives, $\frac{1}{4}$ -in. and $\frac{1}{2}$ -in., would be a good selection. This is the equipment suggested for the Baker stand illustrated above, giving a magnification of 53 to 406. The Beck microscope shown at foot of page, with two eyepieces (x8 and x10) and a $\frac{1}{4}$ -in. object glass, magnifies from 62 to 110.

There remains the question of lighting, and as in Great Britain daylight of the necessary quality is usually lacking, it is better to provide an artificial light, preferably electricity. The bulb should be of ground glass, and if monochromatic light is required the bulb can be tinted blue. A very



Microscope. Sectional diagram showing how the light passes from the reflecting mirror through the condenser to the object on the slide, and thence through lenses to the eye.

easy way of doing this is to streak the glass with a blue grease pencil—of the sort sold for writing on glass—turning on the light and distributing the greasy material regularly and evenly over the whole surface by means of a piece of cotton-wool, when the bulb has warmed. Some microscopes incorporate a light source. Before placing the slide on the stage, to which it will be secured by the spring clips, the eyepieces should be removed, and the mirror adjusted to give the best illumination up the tube, the iris diaphragm being fully open. The eyepiece should then be returned and the diaphragm closed down until a dim light only comes through. This should all be done with the objective nearly touching the stage. Now rack up the body tube about $1\frac{1}{2}$ in., place the slide in position and, using the low-power objective and coarse adjustment, rack the tube down slowly until the blurred image of the specimen can be seen. Obtain a sharp image by means of the fine adjustment, and if the light is too dim open the diaphragm a little until the necessary illumina-



Microscope. Descriptive photograph illustrating the main parts of a high-power microscope.

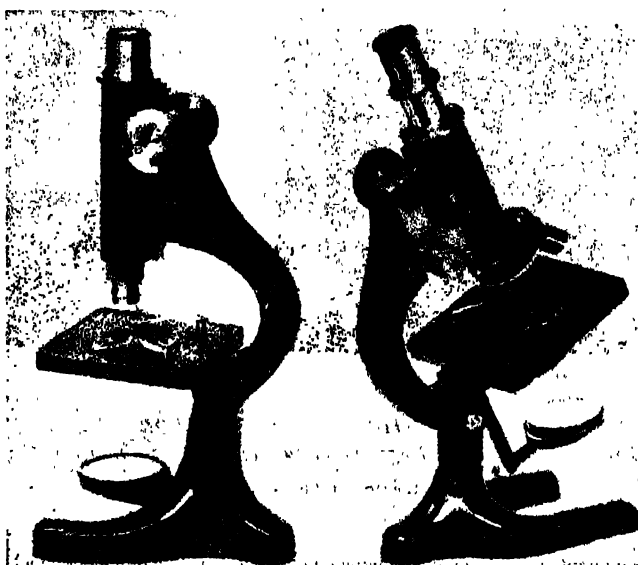
tion is obtained. Great care must be taken not to rack down too far. A broken slide is not a very serious matter, but the lens of the objective is very easily damaged, and if it is scratched or displaced its repair may be a rather expensive matter. If the specimen is not sufficiently magnified to bring out the desired points, substitute an objective of higher power. It will probably be necessary to readjust the fine adjustment after changing the objective.

MIDDLINGS. This is a mixture of broken-up bran or husk produced in the milling of flour, and it is fed to pigs and poultry. It is the basis of most mashies and is also used to dry off wet mashies. It is similar to coarse flour in appearance, but more pinky-white in colour. The more white its colour the lower its feeding value, as the pinky part of the middlings contains the wheat phosphates and cereoline, the latter acting as a digestive agent. The term middlings is also applied to the product from roller flour-milling. The rollers first break up the grain of wheat, which, apart from the bran, can be separated into three grades, known as semolina, middlings, and dunst.

MIDGE. To prevent the unwelcome attention of midges, nothing is more efficacious than rubbing the neck, wrists, and other exposed parts of the body with olive oil to which is added some oil of rosemary, lavender, eucalyptus, or pennyroyal. One teaspoonful of any one of these should be added to 1 or 2 oz. of olive oil.

The irritation from bites can sometimes be removed by applying chloroform or weak solution of ammonia. The following prescription is useful for the same purpose.

Menthol	10 gr.
Rectified Spirit	4 grams
Strong solution of Ammonia	2 drams



Microscope. Left, simple vertical stand, with rack and pinion focusing. Right, inclinable stand, with rack screw for coarse and fine adjustment.

Copyright by R. F. Baker and C. Baker

The menthol should be shaken up in the spirit until it is dissolved, and the mixture added to the ammonia. See Bite; Stung.

MIDWIFE: Her Qualifications. A woman who attends women in childbirth is a midwife. In an emergency any woman may have to stand by another and help her but, except in an emergency, it is illegal for any person to act except under supervision of a doctor unless she is a qualified doctor or has passed an examination and received a certificate of competency from the Central Midwives Board. The penalty is a fine of £10. To obtain a certificate by false statements is punishable by 12 months' imprisonment.

The Central Midwives Board has power to register midwives, to hear complaints about



Mignonette. Fragrant blooms of the giant variety of this old-fashioned plant. See article below.

them, and to suspend or debar them from practice. The county (sometimes the district) council is the local supervising authority with power to investigate all charges of malpractices, neglect, and the like, and with power to report to the central board. The authority can also make grants for the training of midwives.

A person who acts as a midwife—except a neighbour acting in an emergency—is liable for damages for negligence if, through her incompetence, any harm comes to the patient. It is no answer for her to say she did her best, unless she displayed the skill and showed the knowledge of a competent midwife.

The address of the Central Midwives Board is 73, Great Peter Street, London, S.W.1.

The Central Board for Scotland is at 18, Nicolson Street, Edinburgh.

MIGNONETTE.

This favourite annual, *Rosa odorata*, bears sweet-scented flowers which in modern varieties are of various shades of colour—reddish, brown, yellow, and white. This plant is rather capricious and may fail unless suitable conditions are provided. Seeds should be sown

in April on well tilled soil to which lime has been added if necessary, the soil must be made firm before sowing. The seedlings must be thinned out to give the plants room to develop. *Reseda glauca*, with grey-green leaves and white flowers in summer, is a hardy border perennial.

Mignonette will bloom in winter under glass if seeds are sown in 5 in. pots in August, the seedlings being thinned out to three in each pot: they must not be transplanted. Firm loamy soil containing mortar rubble or a scattering of lime suits them best. A temperature of 50 degrees is suitable.

MIGRAINE: The Headache. Migraine or *megrin* may be due to such widely differing causes as eye strain, worry or fatigue of the brain, want of exercise, or a too rich diet. Not infrequently it appears to be hereditary.

There may be a sense of depression for some hours preceding the onset of the pain, which commonly begins on one side of the head. The pain is of a throbbing character, and is aggravated by noises, jarring and bright lights.

Regular daily exercise, open bedroom windows, and attention to chewing of food may help in preventing an attack. The diet should be plain. Examination of the eyes by an oculist, attention to decayed teeth and to diseased conditions of the nose and ears will be found to be worth while. When an attack threatens, a cup of hot tea or weak coffee may prevent it. Drugs are to be avoided until other measures fail. An essential part of treatment is complete rest in bed in a darkened room, with cold compresses, constantly changed, over the forehead. See *Bihousness; Headache*.

MILDEW: How to Remove. In appearance resembling a blue or a green mould, mildew is found on jam, cheese, oranges, and other fruit, on bread that has been kept too long, and on many other foods, as well as on leather coverings of furniture, and on linen and cotton. When closely examined the fungus plant is seen to be a collection of fine threads with spore-bearing branches, which may extend in all directions if the mischief is allowed to remain undiscovered. There are several forms of mildew which may develop as a mould on food or a rust on plate.

Causes of Mildew. Damp is nearly always the predisposing cause. Clothes or food stored in damp cupboards are always liable to be affected, and such cupboards should be inspected at intervals and their contents carefully examined for any traces of mildew. Where linen or cotton are affected the marks are easily removed if the articles have not been left too long unexamined. A good plan is to wet the mildewed parts, rub them with ordinary laundry soap, and cover them with precipitated chalk, which should be rubbed well in. The clothes are then allowed to remain undisturbed for an hour or more, after which they are thoroughly rinsed out. If any traces of mildew still remain the operation should be repeated once again.

When the mildew has been allowed to spread or become settled, damp salt should be rubbed in and the clothes exposed to warm sunshine if possible; the process may have to be repeated on several days, but is nearly always successful. Strong soapuds may be used as well as the salt. Mildew on leather can be removed by rubbing with vaseline. In the case of food it is generally sufficient to expose the portion affected.

Besides soap and water, sour milk may be used to remove mildew much in the same manner, the stains being soaked overnight and the article placed in the sun without rinsing. Lemon juice may be employed, and is effective in removing slight stains. For old and persistent stains on white fabrics

potassium permanganate is sometimes employed. It is prepared by dissolving a teaspoonful of the crystals in a pint of water.

An American remedy is javelle water, which is made by dissolving 1 lb. of washing soda in a quart of water, and adding $\frac{1}{2}$ lb. of ordinary bleaching powder. It should not be applied to coloured materials. It is allowed to remain on the fabric for 1 min. only, then oxalic acid solution is applied, and the stain is dipped in water. See *Damp*.

MILDEW: In the Garden. This is one of the most troublesome diseases which affect plants and trees. It is easily recognized by the greyish mould-like substance on affected

leaves and shoots. Its effect is seriously to cripple growth. Fallen leaves from diseased trees and plants ought to be gathered and burnt in autumn, for mildew is carried over the winter by resting spores. Sulphur is the best antidote. Green sulphur scattered on and among rose bushes in winter does good and in early summer spraying with liver of sulphur (potassium sulphide), 1 oz. in 2 gallons of water, is advised. Fruit trees should be sprayed with lime sulphur in spring before the blossoms open. See *Lime*.

Milfoil. Many plants suitable for the border or the rockery are comprised in the milfoil family, also known as *Achillea* (q.v.).

MILK: FRESH AND PRESERVED

Food Value and Use of this Important Article of Diet

The reader is referred from this entry to those on Diet, Invalid Cookery, and to the many on the foods in which milk is an ingredient, e.g. Butter, Cheese, Custard, Junket and the various milk puddings. See also Lactometer

Milk is called a perfect food, because it contains all the substances necessary for the growth and the work of the body. For any young animal its mother's milk normally contains these substances in the correct proportions. In the artificial feeding of infants, and when using milk in a sick or an ordinary dietary, cow's milk is generally used, though recourse is sometimes had to the milk of other animals, such as goats.

Analysis of Milk. Cow's milk varies widely in quality, but it should have about the following composition:

	Per cent
Protein	3.5
Fat	4
Sugar	4.5
Mineral matter	0.7
Water	87.3

The total amount of solids in good milk is thus nearly 13 per cent. The milk of one cow may be half as rich again as that of another; the milk that is usually sold is a mixture of the produce of many cows, part of the cream having been removed and water added. Care should be taken, therefore, to see that the milk for the use of children and invalids is up to the average standard and free from contamination.

The specific gravity of milk is between 1028 and 1034. If water is added to the whole milk the specific gravity falls below this figure. But if some of the cream be removed it goes up. The dairyman can therefore remove part of the cream and raise the specific gravity; he can then add water and bring it down again to the normal 1028. The composition of various kinds of milk is shown approximately in the following table:

	Protein per cent	Fat per cent	Sugar per cent
Human	1.5	4.0	6.7
Cow's	3.5	4.0	4.5
Goat's	4.5	3.5	4.5
Ass's	1.6	1.0	5.5

It is obvious that cow's milk is too rich in protein when used in infant's food, and must be diluted. But when diluted it is too poor in fat and very much too poor in sugar. Sugar must therefore be added, and a little cream is also desirable—1 or 2 teaspoonfuls to the bottle. Milk contains very little iron. This is no disadvantage to infants, who are born with a large store of iron. But when an infant is pallid and anæmic it is well to give it daily a part or the whole of an egg yolk well beaten up with the milk. The quantity of yolk will depend on age and power of digestion, and this can be gauged by noting whether the child digests it well.

In consequence of its lack of iron, milk as the sole diet of adults tends to produce anæmia. Cow's milk contains all the necessary vitamins, anti-rickets, anti-scurvy, and anti-beriberi. The sugar naturally present in milk

(lactose or milk sugar) differs from cane sugar. It is more easily assimilated than cane sugar, and should be used to sweeten the feed of cow's milk when the greater cost is of no consequence.

Digestive Qualities. The digestibility of milk varies according to its condition as the following figures prove. Boiled milk takes longest to digest, but this must not be taken to mean that it is not quite as completely digested as raw milk.

	Hours
Soured milk	3
Buttermilk	3
Whole milk, raw	3½
Skimmed milk, raw	3½
Boiled milk	4

Milk clots quickly after reaching the stomach. It is sometimes advisable, therefore, to dilute it with water, lime water, or barley water for an infant, while adults should sip the milk slowly, dilute it if necessary, and eat a biscuit or a piece of toast. For infants a good plan is to add some citrate of soda, in the proportion of 1 to 3 gr. to 1 oz. of milk. This can be obtained in 5 to 10 gr. tablets.

Milk is so readily contaminated that it should be kept with great care. It should be delivered in closed vessels, glass bottles being best, as they are easily kept clean. It should be stored in a cool place, separate from other articles of food. It should never be kept in an open vessel or allowed to become contaminated by dust or flies. The common practice of leaving the milk outside the door in an open vessel in the morning was a dangerous one.

Pasteurization. The dangers arising from the contamination of milk by microbes can be largely avoided by the process known as pasteurization. To accomplish this, milk is heated to 145° or 150° and kept at this temperature for 30 minutes. Most of the milk sold in Great Britain is now pasteurized by the dairies, as a matter of routine, but a pasteurizer for home use can be purchased. In making use of this, the water in which the bottles are placed is brought almost to the boil, then the heat is turned off, and the milk is cooled rapidly and stored in a cool place. The containers must be kept covered. To safeguard against tuberculosis germs it is advisable that milk should be boiled for a few minutes. Infants fed on heated milk need a teaspoonful of orange juice once or twice a day.

Peptonized or pancreatic milk is often ordered in place of ordinary milk for invalids, infants, and persons of weak digestion. A simple method of peptonizing milk is as follows. To $\frac{3}{4}$ pint of milk add $\frac{1}{2}$ pint water and bring to a temperature of 140° F. The required temperature may be obtained by halving the diluted milk, bringing one-half to the boiling point and mixing it with the other. To this milk mixture are added 2 drams of pancreatic solution and 20 gr. of sodium

bicarbonate. The mixture in a covered jug is kept in a warm place for 10 to 20 min., is then brought to boiling point and immediately removed from the heat.

Artificially Soured Milk. Skimmed milk contains about $\frac{1}{2}$ of the fat of whole milk; separated milk contains little or none. Butter-milk is a thickish, somewhat acid residual milk left behind after churning and removing the butter. It is often a valuable food for invalids and sickly children. Soured milk can be prepared with one of the ferments or lactic acid bacilli, such as the Bulgarian bacillus, sold for the purpose, or it can be bought from a reliable dairy. (See Sour Milk; Yoghourt.)

Whey is the fluid squeezed out when milk is clotted with rennet or an acid such as white wine. It contains very little nutritious matter except sugar, but is a refreshing and slightly laxative beverage. To make whey, add 1 teaspoonful of rennet to $\frac{3}{4}$ pint of milk which is warmed up to 104°; with a spoon break up the clot that forms, and strain through muslin. Junket is milk clotted and partly digested with rennet. It is an extremely digestible and nourishing food.

Condensed Milk. Sold in three forms, condensed milk is either whole sweetened, whole unsweetened, or skim sweetened. In making the unsweetened variety, 3 pints of whole milk are, as a rule, evaporated down to 1 pint. This contains all the nutriment of the 3 pints, and when 2 parts of water are added to 1 part condensed milk the result is the equivalent of good cow's milk. For infants, further dilution and the addition of sugar and cream are necessary. This is an excellent food, its one disadvantage being that it keeps good for only a very short time after the tin has been opened.

Condensed whole sweetened milk is usually evaporated to the same degree. But to this is added a large quantity of sugar, which in infants may give rise to gastric fermentation. If the various brands of condensed whole milk are diluted according to the directions on the tin, the child gets insufficient fat. He may be plump and heavy, fattened by the sugar, but generally is pale and not so robust as he should be. Condensed milk is more digestible as a rule than ordinary cow's milk, and often agrees when the latter does not, but it should only be used for a few weeks at a time, and attempts should be made to replace it as soon as possible by ordinary milk. Obviously, to supply the deficiency of fat some cream should be added. Cod liver oil serves the same end.

Condensed skimmed milk is wholly unfit for infants. It contains only a trace of fat, and is so sweet that if diluted sufficiently to suit the child's taste the child will be slowly starved. This should only be used for cooking purposes.

Several reliable brands of milk powder, consisting of milk from which all the water has been removed, are sold; when these are made up with water a quite satisfactory milk food for infants is obtained.

Casein, casumen, plasmon, protein, etc., are highly nutritive and very digestible. They can be added to other foods, such as puddings, soups, etc., and form an excellent article of diet for weakly people and in fevers.

Milk for Invalids. Milk and its various modifications form a most valuable food in many diseases, especially in typhoid and other fevers, acute kidney disease, ulcerated stomach, etc. In diabetes the place of milk may be taken by so-called artificial milk, which can be made as follows: Mix 4 tablespoonfuls of good fresh cream with a pint of water, and let it stand for 12 hours in a covered vessel. Then skim off the cream, and beat it up with the white of one egg, a little flavouring of salt, and $\frac{1}{2}$ pint of water.

A few small points are worth mentioning. If milk produces costiveness add some magnesia or brown sugar to it. If it lies heavy on the stomach dilute it, or eat a biscuit with it. If it causes biliousness add half a teaspoonful or less of salt to each pint. A very good way to take milk is in a custard made with gelatin, i.e. milk jelly.

Milk should not be taken at the same time as medicines, or for $\frac{1}{2}$ hour before or after. Never give a child castor oil or other medicines in milk, which would make him dislike it as a food. Remember that many infectious diseases are conveyed in milk, namely, tuberculosis, diphtheria, scarlet fever, infantile diarrhoea, so fatal in hot weather, and typhoid fever. To avoid these always boil or pasteurise the milk when there is any possibility of its being contaminated. Sometimes, but rarely, milk also causes ptomaine poisoning.

Use in Cookery. Milk forms the basis of many puddings and sweet dishes, and is introduced into soups and sauces, not only to improve the colour but to enrich them and provide extra nourishment. Milk also, if made into custard with eggs, becomes a substitute for cream, and can be served with fruit pies and puddings or with stewed fruit.

In hot weather milk should be scalded in order to keep it sweet. If it should become very slightly soured it can be restored by adding a pinch of bicarbonate of soda, and it will often boil without curdling. If really sour and unfit for table use it should not be thrown away, but used in the making of cakes. Cream cheese can be made from sour milk. Wrap it in muslin and allow it to hang until all moisture has dripped from it, scald the curds, dry again, and beat up with salt and pepper to taste.

Testing the Milk. By using a simple contrivance the housewife can easily test milk at home, in order to see whether or not it has been skimmed or adulterated with water. This form of tester somewhat resembles a pocket thermometer, and is marked to scale. When dipped into the milk, it will sink until the top of the milk reaches one of the coloured divisions. The deeper the tester sinks the greater is the dilution.

T.T. Milk. The elimination of tuberculous infected cows and the gradual increase in the number of tubercle free herds received official encouragement in 1923 under the Milk Special Designations Order, when tuberculin tested milk (including certified milk) received recognition, and its sale at a special price to cover the milk producer's extra expenses was permitted. A tuberculin-tested herd might, however, include one suffering from abortion or mastitis, so that the milk it gives is free from only one of the three bovine diseases which may be transmitted by milk. About 20 per cent. of milk sold in Great Britain is T.T.

Sale of Milk. In Great Britain certain standards for dried milk have been fixed by regulations for the protection of the public. No person may sell dried milk for human consumption unless it is properly labelled to show that it contains (1) dried full cream milk, (2) dried partly skimmed milk, or (3) dried machine skimmed milk. Each class must conform to certain standards of milk fat. Some classes of dried milk must show printed warnings as "Should not be used for babies except under medical advice," or "Unfit for babies," the object being to warn parents of the abstraction of fat. Provision is made in the regulations for samples to be taken, to see that the public is being protected.

No person may put into circulation condensed milk which is not labelled in accordance with the condensed milk regulations. These have been designed to protect the public and to give them an indication on the labels

as to the quality of the contents of the tin. Several grades are mentioned, such as "condensed full cream milk," sweetened or unsweetened, as the case may be. With skimmed milk it must show on the label "condensed machine skimmed milk," or "condensed skimmed milk," "sweetened," or "unsweetened," to indicate what the tin contains. Standards of milk fat are fixed for each grade, and samples are taken periodically.

MILK FEVER. Fever occurring about the third day after childbirth, when the secretion of milk by the breasts is becoming established, used to be called milk fever, but the term and the idea underlying it should be dropped. Its occurrence should always be brought to the notice of the doctor.

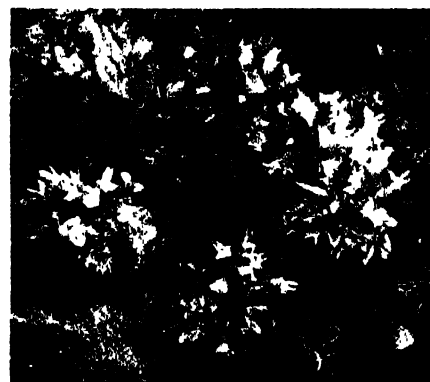
MILK JELLY. This dish, which is suitable for invalids, is made as follows. Beat a pint of milk with the thinly cut rind of a quarter of a lemon, but do not allow the milk to boil. Then add $\frac{1}{4}$ oz. white sugar and $\frac{1}{2}$ oz. sheet gelatine, and stir the mixture until it is dissolved and is of the consistency of cream. Pour it into a wetted mould and leave until set.

Milk jellies can also be made by using the ordinary packet jellies and making them with milk instead of water. A little hot water, not boiling, should first make the jelly liquid, a pint packet of jelly being made up to a pint with cold milk. Stir it well and pour it into a wetted mould to set.

A double colour effect can be obtained by the use of two jellies, lemon and raspberry, the raspberry being made with milk, as already described, to fill half the mould, and the lemon, which has been made in the ordinary way, added to the mould before the raspberry jelly is quite set.

MILK PUNCH. To make this, take a pint of milk, 2 oz. of loaf sugar, $\frac{1}{2}$ gill cream, and a tablespoonful each of brandy and rum. Boil the milk, dissolve the sugar in it, strain it, and when it is cool freeze it partly. Then add the cream, which should be well whipped, and the two spirits. Mix them all together and freeze the mixture further. It should be served in small china cups with a little nutmeg or cinnamon grated over it.

MILK VETCH. This shrub and perennial (astragalus) bears pea-shaped flowers in summer, and thrives in ordinary soil. Most of them are of little value as decorative garden



Milk Vetch. Clump of this effective rockery plant

plants. The goat's thorn (tragacantha) is a low shrub, with spiny branches, which bears lilac-coloured blooms. Monspessulans, a trailing plant for the rockery, has reddish-purple flowers. Propagation is by seeds sown as soon as they are ripe in late summer.

MILKWEED. The best of the milkweeds (Asclepias) for the garden is tuberosa, commonly called the butterfly weed. This is a perennial, 2 ft. high, which bears showy orange-coloured flowers. It needs soil consisting largely of peat or leaf-mould, and should be planted in a somewhat shady place.

MILKWORT. This is a genus of shrubs and perennials (*Polygala*) some of which are suitable for the greenhouse, others for planting out of doors. They bear pea-shaped flowers of



Milkwort. Yellow flowers of the species *chamacuburns* in a rock garden

various colours. *Polygala dalmaisiana*, which bears purplish flowers in spring, thrives under glass if potted in a compost of loam, peat and sand. Propagation is by cuttings in summer. The plants should be pruned as soon as the flowers are over. *Polygala chamaebuxus* is a low-growing rock garden plant with pale yellow flowers, needing sandy, peaty soil. It is propagated by seeds and division.

MILLET. This name has been applied indiscriminately to the plants of at least four different families, but the generally accepted millet is the hardy annual *Panicum*, which thrives in any ordinary soil and position on a sunny border. The seeds should be sown in March or April, and the plants thinned out later on, as desired. The flower sprays will be ready for cutting for the purposes of indoor decoration about the month of July.

Millet is not used as a food in Great Britain. In countries where Indian corn and other grains do not grow well the seeds are ground into meal for bread.

MILLIAMMETER. This is a form of ammeter designed to measure current in thousandths of an ampere. It is a useful instrument for the owner of a broadcast receiving set. With the aid of a milliammeter it is a simple matter to determine the anode current taken by the valves, and thus to make sure that they are being operated correctly. In making such a test the milliammeter is connected between the high-tension lead from the H.T. battery or eliminator and the appropriate H.T. + terminal on the set. (The + terminal of the meter is joined to the high-tension lead.) For sets employing up to four valves, a meter having a range of 0-25 milliamperes is suitable. See Electricity; High Tension; etc.

MILLINERY. The term millinery comprises the making and trimming of women's hats and also the fashioning of various trimmings and shapes. See Hat; Head Lining.

MILLING. This is a process of removing metal by a rotating cutter from a piece of work which is bolted down to a table capable of sliding sideways and endways and vertically. In effect, milling is the exact opposite of turning. The tool used in a lathe is held in slides against the rotating work. In a milling machine the work is held and the cutter, which may be provided with several cutting edges or teeth on its periphery and sides, is rotated.

Small lathes are often fitted with attachments which, in effect, convert the tool into a species of milling machine. Some have only a very limited range. Where the lathe

has a compound rest, the most obvious additional device which will provide the third direction of movement is the vertical slide. The work can be bolted to this and brought up to a milling cutter fixed in a chuck on the lathe mandrel. Slotting and grooving can be accomplished in this way within the limits of the stroke of the vertical slide. In some cases the vertical slide is arranged to hold a spindle, running in plain or ball bearings, with a pulley at one end and a chuck for holding the cutters at the other. The body of the appliance is bolted to the vertical slide of the milling attachment, and the spindle is driven by what is termed the overhead gear in referring to foot lathes.

This gear consists of an overhead counter-shaft driven from the foot motor, and a system of pulleys which will drive the milling spindle, but at the same time allow for any change in the position of the milling spindle, both in setting up the work and during the cutting operations. Where the cutter is driven from such a separate and self-contained spindle, the mandrel would be fixed. The work is bolted to the face plate or otherwise fixed to the mandrel. The mandrel may be held by tightening the bearings, but this is an expedient which should only be adopted in an emergency. The lathe should be fitted with a dividing apparatus.

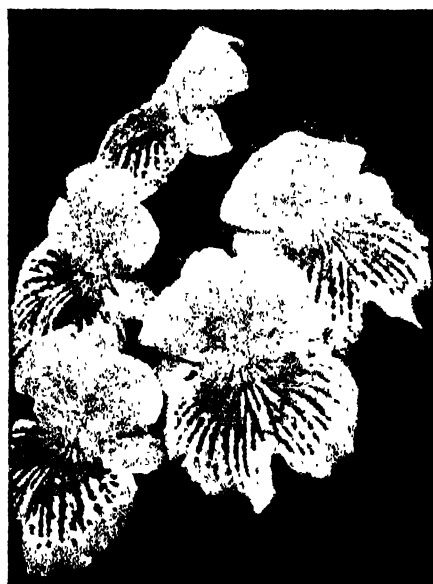
MILLPEDE. This is a troublesome soil pest which may do much damage to bulbs and the roots of plants. It is black or brown, with numerous feet, and curls up when disturbed. It should not be confused with the beneficial centipede, which is flat, lighter in colour, and has only one pair of feet to each segment of the body. A fumigant of 1 lb. of naphthaline and 1 stone of lime, mixed and used at the rate of 1 lb. per square yard, can be dug in to infested soil. Millipedes are frequently found in large numbers in leaf-mould; this should be sprayed with formalin, 1 tablespoonful to a gallon



Millipede, a harmful soil pest

of water, and covered with sacking. See Centipede; Insecticide.

MILTONIA. An easily grown family of orchids suitable for cultivation in a heated



Miltonia. Hot-house orchid, the flowers of which are marked with colour on a light ground

glasshouse. They prefer a shady corner of the house, and may be cultivated in pots or pans in a mixture of peat, moss, and charcoal. They need an average temperature of 70° in summer, 60° in autumn and winter, with plenty of water, except when the temperature is at its lowest. They rest during winter, and the bulbs should be separated early in the year to increase stock.

Miltonia flower in summer. They are excellent orchids for beginners and amateurs who have the necessary heat at their disposal. There are many beautiful varieties of Miltonia vexillaria, the chief species. See Orchid.

MIMOSA. So extremely sensitive is the mimosa or sensitive plant (*Mimosa pudica*) that the leaves will fold up at the slightest touch. The plant belongs to a small family of greenhouse perennials with diminutive acacia-like foliage.

Mimosas should be grown in a mixture of two parts loam, one part leaf-mould, and a good sprinkling of sand. While young the plants require warm-house treatment, but a cool greenhouse will suit them in the mature stage. Propagation is by seeds sown in heat in spring.

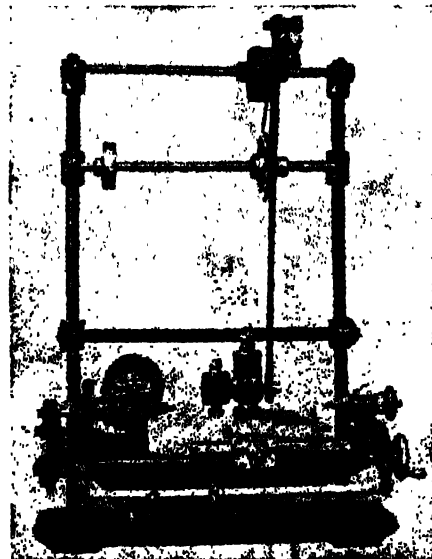
MIMULUS. This is the scientific name of the musk, or monkey flower. The common yellow musk (*Mimulus moschatatus*) has unfortunately lost its fragrance.

MINA. This half-hardy climbing annual, *Mina lobata*, bears showy yellow and crimson flowers in summer. It is raised from seeds sown in a heated greenhouse in early spring and the plants are set out of doors in May against a trellis, arch or veranda. The seedlings may be repotted and grown in the greenhouse.

MINCE; How to Prepare. The colour of a meat mince must be appetizing and the consistency creamy. It must be thoroughly hot, yet must only just reach boiling point, or the fragments of meat will assemble scraps of leather. It must also be skillfully seasoned.

Cut about 1 lb. cold meat free from bones and uneatable pieces into very small cubes, or run it through the mincing machine. Fry 1 tablespoonful finely chopped onion and 1 oz. flour a rich brown in 2 oz. hot beef dripping. Stir in gradually $\frac{1}{2}$ pint good stock, and continue stirring it until the sauce boils. Cool a little and lay in the meat.

Bring to the boil, then cover the pan and let it stand by the side of the fire until the meat is well flavoured with the gravy and



Milling. Complete indexing, milling and gear cutting attachment fitted to a lathe. Centre lathe. Courtesy of Drummond Bros., Ltd.

soft through; this will take at least $\frac{1}{2}$ hour. Serve in a hot dish within a border of toast sippets or mashed potato. A savoury method of using up the remains of a cold joint or portions of game or poultry is to mince the meat and heat it in thickened gravy or sauce. Remove all the flesh from the bones and clear it from skin and gristle. The bones and trimmings should be added to the stockpot. Now chop the meat or pass it through the mincer and mix it in with the gravy or sauce, which should be ready boiling.

Slightly season the meat before adding it to the liquor. Boil it up and let it simmer for 8 min., never longer. The sauce should be brown or white, according to the nature of the meat which is to be used, and a plain dish of minced poultry or game is always garnished with sippets, toast for brown meats and fried bread for white meats.

Mince can be adapted for various side dishes or entrées, but the foundation is the same, only the solidity and flavour of the sauce is altered according to the character of the meat. See Croquette; Cutlet; Galantine; Shepherd's Pie.

MINCEMEAT. The ingredients for making mincemeat vary considerably, almost every cook having her own recipe.

To make a plain mincemeat, pare, core and chop up finely 2 lb. apples, then add 1 lb. each of currants, stoned and chopped raisins, and brown sugar, $\frac{1}{4}$ lb. very finely chopped suet, $\frac{1}{2}$ lb. candied peel, chopped very small, a level dessertspoonful powdered allspice, a pinch of salt, and the juice and grated rind of 2 lemons. A little brandy or rum may be used to moisten it, and a little raisin or other wine. Mix the ingredients very thoroughly, cover with a cloth, and let the mincemeat stand for some hours before putting it into small jars and tying them down.

A rich mincemeat is made as follows. Chop $\frac{1}{2}$ lb. beef suet very finely, and mix with it $\frac{1}{2}$ lb. currants, and 6 oz. mixed candied peel, cut up very small. Add $\frac{1}{2}$ lb. chopped, stoned raisins, 1 lb. apples, pared, cored and chopped, and 2 oz. blanched shredded almonds, and mix all together. Next chop up $\frac{1}{2}$ lb. lean cold roast beef, or of fresh boiled ox-tongue, and add it to the other ingredients, with 6 oz. of brown sugar, $\frac{1}{2}$ oz. of allspice, $\frac{1}{2}$ a grated nutmeg, the juice and grated rind of a lemon, and a teaspoonful salt. When all these ingredients have been thoroughly blended, press them down in the basin and pour over them $\frac{1}{2}$ gill brandy and $\frac{1}{2}$ gill port or sherry. Cover the basin, and let it stand for 24 hours before putting the mincemeat into small jars and tying them down.

Mincemeat should be made at least a fortnight before it is required, so that the flavours of the various ingredients will have time to blend. It should be stored in a cool, dry place, and preferably in small jars, for, if a large jar of mincemeat is opened, the portion that is not used soon becomes too dry. Mincemeat should never be dry and crumbly, nor should

it be too moist, or the undercrust of the mince pies will not rise.

MINCE PIE. To make mince pies, grease some rather deep patty pans, and line them with good short or flaky paste, rolled quite thin. Put in plenty of mincemeat, and cover with another round of paste, moistening the edges and pressing them together. Make a little hole in the top of each pie, and brush them over with beaten white of egg, before baking them in a good oven for 20-30 min.

They are best re-heated by being put on a baking-sheet in a moderate oven for a few minutes. If the oven is too hot, and there is risk of their burning, it is desirable to leave the oven door ajar. See Christmas; Pastry.

MINCING MACHINE. Frequently known as the mincer, this is a useful kitchen appliance for desiccating foodstuffs; for instance, cutting up pieces of cold beef or cold mutton so that they can be cooked in various savoury ways. There are several kinds on the market, most of them being made so that they can be fastened quite easily on to the edge of the kitchen table. Before it is put away all the component parts of the mincer should be carefully cleaned and dried.

A typical example of the popular type of machine comprises a cast-iron receptacle with a bell-mouthed top and a screw clamp arrangement at the bottom for attachment to a table. The bell-mouthed opening or hopper, with spiral grooves at right angles, forms part of the tunnel in which a screw or worm rotates. One end of the tunnel is closed and formed into a bearing for the spindle of the worm. The other end is open and has an outlet for the minced food. The outlet aperture is covered by a circular steel plate with holes. The second plate is attached to the outer edge of the worm spindle, and this also has holes in it, but of smaller size. A crank and handle are provided for rotation of the worm.

The food is cut up and put into the hopper mouth, and as the handle is rotated the pieces are

pressed down on top of the worm, which forces them through the tunnel and out through the apertures in the steel plates or knives. As one of these knives is fixed and the other movable, the action is analogous to that of cutting with scissors. The function of the worm and the shaped grooves in the tunnel is to propel the foodstuffs towards the cutting knives. These knives cut up the food as it emerges and deliver it in small pieces, when it is ready for whatever cooking operation is necessary.

Parts of the Mincer. Fig. 1 shows the mincer in use, and Fig. 2 the component parts. It will be observed that the crank is attached to the end of the worm shaft by a thumb screw, and that the boss of the crank has a triangular-shaped hole in it, which fits on a corresponding boss on the end of the worm spindle. The thumb-screw forces the crank into close contact with the tapered triangular end of the shaft. The other end of the worm is provided with a thumb nut, and the end of the worm is formed with a pair of flats, which engage in a slot formed in the centre of the moving knife. The fixed cutter has a circular hole in the centre in which the worm shaft rotates. The cutter is prevented from moving by a small projecting peg, which engages in a slot in the top of the mincer.

Fig. 3 shows the fixed plate in position, the fixed blade fitting into a recess formed in the end of the mincer. It is important to see that the fixed blade fits properly into the recess, and that it is free from little pieces of bone or other hard material which would prevent it bedding down flat. The moving blade should bear evenly against the fixed blade; the pressure between them is regulated by means of a wing nut and can be varied by tightening or slackening the nut. The crank should always be attached firmly to the worm spindle, as if it is allowed to get slack it will speedily wear the hole and the boss will no longer function properly. The crank ought always to be placed and tightened on the spindle before tightening the cutting blades; if this is not done, the blades may draw the worm too far through the tunnel, with the result that when the thumb-screw is tightened up on the crank handle, it will be found to jam the spindles.

Usually this class of mincer is made of malleable cast iron galvanized, and with ordinary care it will give years of satisfactory service. Spare knives are generally supplied with it. When they become badly worn it is possible to re-sharpen them by grinding the surfaces, or by cleaning out the holes so that the edges are perfectly square and clean. Grinding may be effected by sprinkling emery powder on a piece of sheet glass, moistening it with oil, and then grinding the knives by pressing them down on the glass and rubbing them on the surface with a slightly rotary movement.

Other varieties of mincer are made larger in capacity than the small household type illustrated. In some varieties the knife blades are attached to the worm shaft, while others have a glass hopper.

MINDERERUS SPIRIT. The solution of ammonium acetate, or mindererus spirit, is a useful and much prescribed diuretic. The dose is from 2 to 6 fluid drams. It has also a mild diaphoretic action, and is thus a valuable ingredient in fever mixtures. See Diuretic.

MINERAL WATER. In a popular sense effervescent waters containing carbonic acid gas only, such as soda water, or carbonic acid



Mincing Machine. Fig. 1. Typical domestic mincer in use. Fig. 2. Component parts shown separately. Fig. 3. Fixed knife blade securely fixed, and stop piece in position

and some flavouring substance, as lemonade, ginger ale, etc., are classed as minerals or mineral waters; but more strictly mineral waters are those which contain inorganic salts in sufficient amount to be active. These are of two classes: effervescent waters containing carbonic acid and some medicinal salts such as Seltzer, Apollinaris, Rosbach, and sparkling Malvern; mineralized waters which contain no carbonic acid and do not effervesce.

All aerated or carbonated waters have a soothing effect on the mucous membrane of the stomach, and assist digestion, but if taken in excess they cause indigestion and flatulence. Mineralized waters are used as table waters or for the medicinal effect, according to the quantity of mineral matter contained.

Kinds of Mineral Water. Table waters should not contain more than one per cent of mineral matter. Most of them are slightly alkaline, and when used to dilute acid wines they partly neutralize the retarding influence of the wine on digestion. Among these are Apollinaris, Johannis, Kronthal, Perrier, Seltzer, sparkling Malvern, and Vichy. Some act on the bowels, some on the kidneys.

The laxative waters, having a mild effect on the bowels, include Contrexeville, Harrogate, Kissingen, Kronthal (red label), Seltzer. The purgative waters, containing sodium and magnesium sulphates, and known as bitter waters, include Apenta, Franz Josef, Hunyadi Janos, Kissingen. Among the diuretic, kidney-stimulating water are Apollinaris, Cheltenham, Harrogate, Johannis, Kronthal, Marienbad, Seltzer, Vichy. At various spots there are waters containing iron and arsenic.

Indiscriminate indulgence in active mineral waters is to be deprecated just as much as indiscriminate drugging of any sort. The water used must be appropriate to the unhealthy state which it is proposed to remedy, and this necessitates expert advice. Moreover, the use of any mineral water at home may fail to benefit, whereas its use at the source, where the

treatment may also include baths and other means, and which entails rest of body and mind, may be thoroughly successful. See *Cancer Beer*; *Lemonade*, etc.

MINIATURE. These portraits were at first painted in body colour on vellum or on playing-cards, and afterwards on ivory or paper in transparent colour. An interesting class comprises those done in plumbago, and also in Indian ink, sometimes imitating the effect of line engraving.

The possessor of portrait miniatures should guard them from excessive heat, damp and sunlight. They are quickly ruined if hung in window embrasures or beside the fireplace. Those which are painted on ivory, after the Coway manner, are liable to fade if freely exposed. Should they be valuable it is best to keep them in closed cabinet-trays.

Ivory miniatures are best in unlined, not on stout card, which tends to expand and contract, but on thin notepaper, with dilute gum-arabic. After being pressed dry they may be bound to the glass with gold-beater skin, or surrounded by a velvet pad to exclude dust.

When spots of mildew appear they should be removed with a silk handkerchief, and if the white pigment has blackened it may be scraped away. Most ivories, especially of the 18th century, tend to warp and split, and any serious damage should only be remedied by a miniaturist.

Minim. This measure of capacity is much used by chemists. 60 minims make one fluid drachm or dram. See *Apothecaries' Weight*.

MINK: The Fur. Soft, thick, glossy, and luxurious, this fur is highly valued when made up as coats and wraps. The colour ranges from chocolate brown to yellowish, according to the country of origin.

The mink animal is slender-bodied, short-legged, and weasel-like, and length varies from 15 in. to 18 in., plus a bushy tail. The European mink occurs in Poland, Finland, and most parts of Russia; the Siberian species in districts east of the Yenisei river; the American in N. America. They live around the banks of ponds and streams, and hunt and eat birds, fish, frogs, and lizards.

Because the fur fetches high prices, and some 60 or 70 skins are needed for one full-length garment, trapping has been carried to the point where these animals are becoming scarce. To meet the demand, fur farms specialising in the rearing of minks have been established in Europe and America.

MINT. This is a hardy perennial plant, with aromatic herbage, which flourishes in ordinary soil. It should be planted in early



Mint. Leaves of the aromatic herb much used in cooking.

spring, and, as it spreads freely, the plants should be lifted and replanted once in every 4 or 5 years, otherwise it runs to stalk instead of to leaf. To force mint the roots should be lifted in autumn and placed in boxes of potting soil in a slightly heated glass-house. Moisture and warmth will ensure a crop by Christmas time. One of

the numerous varieties of mint, *Mentha Requien*, is peppermint, and is best grown as a tiny trailing plant in the rock garden. For the purposes of distillation the shoots should be picked when the flowers are upon them. Shade and moisture are the two chief requirements of mints of all kinds.

Uses for Flavouring. On account of its aromatic properties mint is much used in cookery for flavouring sauces, salads, and soup. It is also employed in the preparation of a drink called mint julep. Spearmint is considered the best variety for culinary purposes. Mint is full grown in June and lasts well till August, when it begins to flower. It should then be plucked, dried, and stored in airtight tins or bottles, for winter use. Dried mint is served with some soups and added to seasonings occasionally. When fresh mint is not obtainable, powdered mint may be used as a substitute.

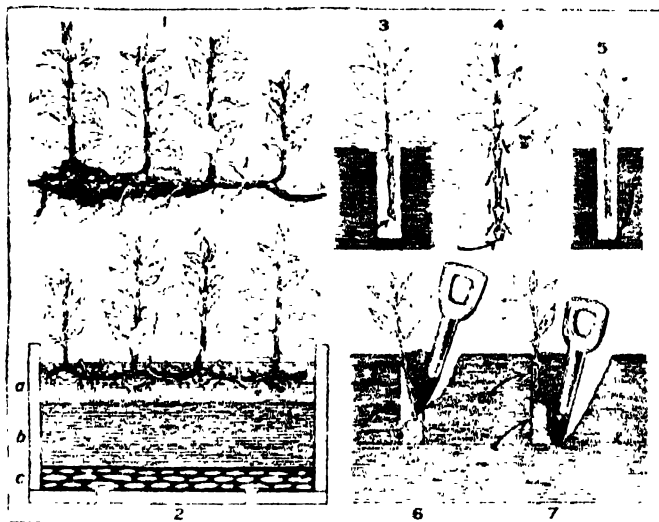
Mint Julep. To make this, place 3 sprigs of fresh gathered young mint in a tumbler and partially fill it with sherry. In a second tumbler put sufficient pounded ice to half fill it. Pour the mint and sherry over this. Transfer the julep from one tumbler to the other several times, then place it on ice for a few minutes.

Mint Sauce. To make mint sauce, chop finely the leaves from 6 or 8 sprigs of mint, and put them into a sauce-tureen with 8 lumps sugar, pour over them 2 tablespoonfuls boiling water, stir well, and let all stand for a few minutes; then add about $\frac{1}{2}$ pint vinegar.

Mint Vinegar. This is made by tiling loosely a pickle bottle with leaves of young mint, and adding sufficient white wine vinegar to cover them. Tie the bottle down securely, and after 3 weeks strain into another bottle and cork it firmly. This is good for winter use.

MINTON WARE

The productions of the Minton works at Stoke stand in the front rank of modern Staffordshire ceramics. They embrace a wide range of styles, both useful and ornamental. Some early Minton resembles Derby and Spode, and may sometimes be recognized by its mark, such as



Mint Culture. 1. Root of mint. 2. Same planted in box: a, fine soil; b, rough soil; c, crocks. 3. Cutting badly cut and planted. 4. Properly prepared cutting. 5. Same well planted on sand base. 6. Wrong way to use dibber. 7. Correct use of dibber.

MINORCA: The Fowl. Black minorcas enjoy a reputation as layers of large white eggs, and their precocity, hardness, and adaptability to all soils and places, combined or otherwise, make them one of the most useful of all breeds. In general appearance they are not unlike the bheorns, having the red face and white earlobes, but a much larger comb.

They also average in weight 2 lb. or 3 lb. heavier and, though not generally acknowledged as such, are not to be despised as table birds. In addition to the single-combed variety of minorca fowl there is also a rose comb and a white variety, both of which have a large following. See *Fowl*, *Poultry*.



Minton Ware. Porcelain bowl dating from about 1800, decorated with Greek key pattern and figure.

British Museum

the double L of Sèvres enclosing an M, or later on the arrowhead device which represents ermine in heraldry. There were also descriptive marks, such as Amherst Japan. Later productions included vases and plaques in a white relief called *pâte-sur-pâte*, which rivals in beauty Wedgwood jasper. These wares usually bear the name Minton sometimes inscribed upon a globe, or surmounted by a crown.

Among the new developments were Parian statuettes and groups, and reproductions of

medieval majolica, besides Persian style faience, and Sèvres porcelain. A fine hard-paste body was introduced for the manufacture of domestic china. A distinctive shape of tea-cup has been given the name of Minton. The Minton works have also played a predominant part in the development of the manufacture of tiles for paving floors and lining walls. See Staffordshire Chinaware.

Mirabilis. The botanical name of the plant popularly called the Marvel of Peru (q.v.).

MIRRORS FOR DECORATIVE PURPOSES

Choice and Arrangement of Antique and Modern Styles

Other aspects of this subject are dealt with under such headings as Cheval Glass; Dressing Table; Toilet Mirror. See also Dining Room; Hall; Living-Room; and the entries on Gesso; Gilding; Lead Art Craft; Silvering

A mirror may be described as a reflecting surface usually made of glass and lined at the back with silver or another brilliant metal. Mirrors are often given pride of place in rooms and halls to day as they are not only decorative, but lend an appearance of space and, by reflection, increase the light in dark corners and passages. Another use of mirror glass is for framing and lining niches or the upper parts of glazed cupboards or recesses, so that the ornaments on the shelves may be reflected and their decorative value enhanced. Finger plates for doors and curtain pelmets are also fashioned of mirror glass, while whole panels are introduced into doors for rooms and cupboards and reflectors on walls.

In the case of such panels they are most effectively used where it is desired to give an air of brightness, as, for instance, in a basement room or dark hall; otherwise the effect might be rather garish and restless. In page 724 an excellent example of the use of mirror panels in a dark corner is illustrated. The mirror inset of the heavy wooden overmantel is now less frequently seen, the place of the latter being taken by one of the charming modern mirrors, with inlaid or marquetry decoration, or by an antique example of beautiful workmanship. Many clever reproductions of old mirrors are obtainable. The frame in others is genuine, but the glass has been replaced so

skillfully that it is quite difficult to detect the modern touch.

In buying an old mirror this matter of the glass is one to which the purchaser should give attention. Often it is so spotted owing to the corroding of the silver backing, that its decorative value is reduced to a minimum unless it is resilvered. For practical purposes also, nothing is more uncomfortable than a reflecting surface pitted with spots. With the exception of a really valuable antique piece which should not be tampered with, the practice of resilvering is quite legitimate. Many mirrors of comparatively recent date have become spotted through careless usage or damp.

Mirrors should be hung in such a position that they are not above the eye level, and are not crowded by pictures or other mural decoration. In the case of a small framed mirror, it is best given a slightly forward tilt, as this allows the air to get to the back. The back board of the mirror should not be cracked and left unrepaired, or such a crack will, in the course of time, appear as a mark on the face of the glass.

When choosing a mirror for a room it must obviously be in harmony with the style of the furniture and decorations. An old gilt frame will look merely shabby amongst very new surroundings which demand severity of

outline or a brilliant surface to all accessories and ornaments.

Early English Mirrors. The earliest domestic mirrors used in England were of polished steel, which were found in large houses of the 16th and early 17th centuries. A corporation of glass mirror makers, however, was formed in Venice in 1664, and probably a few examples of their work filtered through to England, being sent as gifts to members of the royal family and other important personages. Glass mirrors, therefore, were very rare in the time of Elizabeth and James I, and authorities are inclined to suspect the genuineness of any that are said to date from that period.

Mirror makers were brought to England, and the first patent for manufacture was obtained by Sir Robert Mansel in 1615. But the most important manufactory established was that of the duke of Buckingham at Lambeth about 1673; to collectors of old furniture mirrors made there are usually regarded as the earliest specimens obtainable. They had bevelled edges which in themselves show certain characteristics of genuine hand work. The angle between the bevel and the flat surface of the mirror is not mechanically



Fig. 3. Early eighteenth century mahogany mirror with gilt moulding inside the frame

sharp; but is somewhat round, and occasionally various facets can be distinguished gradually melting from the level plane of the glass to the angle of the bevel.

Although few examples of the actual glass used in mirrors of the late 17th century are still in existence their frames are of much interest. Grinling Gibbons carved a number of them very elaborately, and some frames are to be found embroidered with panels of needlework. Others are made of silver or of marquetry and lacquered wood. In the Stuart period frames were usually rectangular, with or without a pediment, and this style was still made in the early part of Queen Anne's reign. A beautiful example of such a mirror in walnut and marquetry, with a semi-circular pediment is shown in Fig. 1.

Queen Anne Mirrors. A familiar form of Queen Anne mirror frame has a graceful arched top, sometimes surmounted by a cresting



Mirror. Figs. 1 and 2. Examples of the Queen Anne period; left, in walnut and marquetry; right, with walnut and gilded frame

Courtesy of Gill & Reigate



Mirror. Fig. 4. Mirror in carved mahogany frame, English make, dating from about 1740. Fig. 5. Convex mirror in an elaborately carved and gilt wood frame, with candle sconces, dating from about 1790.

Fig. 4, by permission of the Director, Victoria & Albert Museum, S. Kensington, Fig. 5, courtesy of Gill & Neale

elaborately ornamented. The lovely example shown in Fig. 2 is framed in walnut partly gilded. The bird on the pediment is an exquisite piece of carved decoration. Owing to the difficulty of making large-sized plates at this period a tall mirror would show two plates of glass joined in the middle just beneath the spring of the arch. Nearly all Queen Anne mirrors now show considerable defects, being spotty and damaged at the back.

Although the most beautiful frames were designed at or about this time, the mirrors made in the William and Mary and Queen Anne periods were not all graceful. Some were, in fact, ugly, owing to their over elaborate crestings or pediments which exaggerated fashion made the rest of the frames appear insignificant, while the carving and ornaments were occasionally coarse and of poor design.



Mirror. Fig. 6. Modern mirror wall decoration made in panels and studded with rosettes of glass. Humphry & Pera Joel

A favourite frame for the commoner type of mirror was a prominent half-round section of walnut. Many examples of this style are seen in toilet mirrors, and some of these are inlaid. Such frames are reproduced to-day for so-called Queen Anne style cheval glasses. Other mirrors were decorated with lacquer work, and gesso was used throughout the 18th century on many gilded frames.

To collectors the most prized mirrors are those containing the original Vauxhall glass of the early part of the 18th century. The best are the wide bulbous ones inlaid with floral arabesques, and having mouldings which may be as much as 7 in. wide. Some valuable ones have marquetry frames, the marquetry being designed in elaborate scroll work.

Georgian Mirrors. An early Georgian mirror with a mahogany frame is illustrated in Fig. 3, and a somewhat later example in Fig. 4. The former has gilt moulding on the side of the frame, while the latter, which is elaborately decorated, is also gilded and carved. The workmanship of these is very fine, and they are typical of the early Georgian period, but they lack the supreme grace of the best Queen Anne mirrors. The superior beauty of Fig. 2 to that of Fig. 4 in the balance of the design exemplifies this.

Wall mirrors designed by Chippendale, the brothers Adam, Hepplewhite and Sheraton were often elaborately carved with classical decorations following in the main the French styles of the period. Chippendale designed many mirrors in Gothic and other architectural styles. During the mid-Georgian period frames of a more severe outline were fashionable. Robert Adam introduced Wedgwood plaques or medallions in the centre of surmounting decorations to mirrors which were sometimes composed of three plates of glass, a larger one in the middle, and smaller ones at the sides.

Circular convex mirrors became fashionable towards the conclusion of the 18th century, and the fashionable furnisher of the day produced a great variety of frames. The one illustrated in Fig. 5 has a deeply moulded gilt frame enriched with balls and surmounting

by a carved bird. Candle sconces are fitted to the sides. In some examples these had out glass drops suspended from them.

Pier glasses date from the end of the 18th century, for it then became possible to get much larger sheets of glass than were hitherto available. Moreover, plate glass, which had been first made in France a century before, was now to a certain extent used for looking glasses.

These large mirrors were fixed to the walls between windows, with console tables beneath, or over the mantelshelf, a position which was utilized for their display to even greater elaboration in the Victorian period.

It was in the early part of the 19th century that the mirror began to be employed in the backs of sideboards, at first in a simple circular convex form. Mirrors were also fitted into the lids of worktables, and the toilet table was developed with the mirror as part of the piece of furniture. Cheval glasses were more commonly seen at this time, for the sizes of sheets of glass had increased so that it was possible to provide a mirror to give a full reflection of the figure at a reasonable cost.

In modern furnishing coloured mirror glass is utilized for wall decoration. Mirrors are also seen with chromium plated frames in severely simple outlines. Pewter frames, with inner borders of coloured glass, ornamented with glass rosettes and studs, are copied from Italian work. Mirrors composed of separate panels and studded with glass rosettes form beautiful mural decorations, as shown in Fig. 6, with its Gothic design. Another beautiful modern mirror decorated with a marquetry panel is illustrated in page 759.

MIRZAPUR CARPET. Large quantities of these Indian floor-coverings are imported into Great Britain. They are woven in symmetrical patterns supplied by European buyers to the factories, which turn off each quality at a uniform price per square yard.

Those which are loosely woven, of short-staple wool, are the least durable. Large numbers have a light cream tone predominating in the field, with strong reds, blues, and greens, which do not mellow with age, but acquire a faded look. Nevertheless, they are among the least expensive of any oriental floor-coverings, and are often useful for hall or landing in small sizes, and for study or smoking room furnished in simple but solid style. They are unsuitable for living-rooms as they are not sufficiently hard wearing to stand family use.

MISTLETOE. This is a semi-parasitic evergreen which grows on the oak, poplar, apple

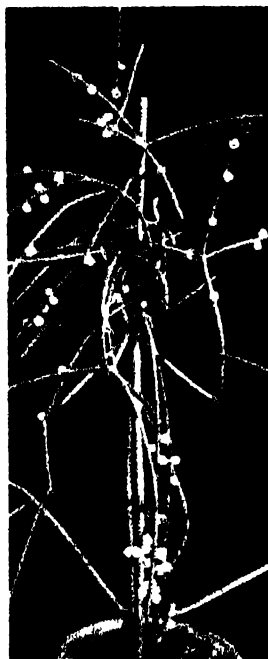


Mistletoe. Sprig of this traditional Christmas decoration

and other trees. Its berried shoots are in great demand for Christmas decorations. The mistletoe is dioecious, i.e. male and female flowers are on separate plants, therefore all mistletoe does not bear berries. It is established by rubbing a few ripe seeds in cracks of branches of suitable trees in March. The seeds must be protected from birds by netting or other

covering, unless they are placed on the underside of a branch, where they will adhere by reason of their sticky outer covering and where they are least likely to attract the roving eye of a hungry bird.

The reason for traditional association of mistletoe with Christmas is not clear. The plant was revered by the Druids, whose worship was carried on in groves. The oak



Mistletoe Cactus. Fruit and leaves of the species *Cassytha*

was their sacred tree, and the oak-grown mistletoe had an important place in their rites. It was ceremoniously cut with a golden weapon by a Druid clothed in white, was received from the tree on a spotless cloth by another Druid, and then borne away by white oxen.

Mistletoe is still prominent in European folklore. It is popularly believed to bring happiness, safety, and good luck, so long as it does not touch the ground; hence kissing under the mistletoe. Great quantities are imported into Great Britain at Christmas, mostly from the orchards of France.

MISTLETOE CACTUS. The common name of this greenhouse plant of the genus *Rhipsalis* is suggested by its appearance. The plants are more curious than beautiful, and are little grown. They thrive in loam, with a liberal proportion of broken crock at the bottom of the pot to ensure good drainage. Propagation is by cuttings in sandy loam.

MITE: In the Garden. One of the most serious garden pests is the mite, which attacks black currant bushes, causing the buds to become swollen and useless. Swollen buds should be picked off and burnt and old branches or parts of them must be pruned out as soon as the fruits are gathered. The best treatment is to spray with lime sulphur every 10 days between mid-March and mid-May.

The pear-leaf mite forms blister-like spots on the surface of leaves. All leaves attacked should be removed and burnt; trees should be given a lime-sulphur spraying in early spring. The filbert bud is a microscopic mite which is found on the buds of filbert, hazel, and cob-nut. The damage is similar to that done by the big bud, and similar treatment is required. See Big Bud; Insecticide: Lime.

MITE: On Poultry. Poultry suffer from the attacks of certain mites. Some live on the birds at night, the red hen mite, for instance; others are permanent parasites, e.g. itch mites, which live at the base of the feathers, and cause the birds to eat them; and others live under the skin and cause scabby growths, such as are sometimes seen on the legs of fowls.

The best method of dealing with these mites is by cleansing operations. The poultry house should be fumigated with bi-sulphide of carbon or another agent, while some paraffin in the cleansing wash is excellent for the perches. For the mites that cause feather-eating the bird should be isolated and oil of cloves rubbed into the affected part. See Poultry.

MITRE JOINTS IN WOODWORK

How to Make and Use a Mitre Box and a Shooting Board

This contribution supplements those on Moulding and Picture Frame. The principal Woodwork joints are dealt with under specific headings, and other valuable hints are given in the general article on Joint. See Cabinet Making; Door; Drawer, etc.

The term mitre is applied to various kinds of joints formed between two pieces of material, as, for example, in picture frames and mouldings. The ends are butted together in such a way that the joint between them bisects the angle between the external edges of the material. A right-angle mitre is one in which the mouldings are at right angles, the angle of the joint being therefore 45°. The particular object of using the mitre is two-fold: the contours of the moulding should exactly meet and flow into each other at the joints, and the inner and outer faces of the moulding should not expose any end grain.

Mitred joints are often keyed at the corners with a plain or dovetailed key, examples of both of which are illustrated. The simple, flat key shown in Fig. 2 is fitted in very small work, by making a saw-cut in the ends of the mitred parts of the frame. In stronger work the key is sawn from hardwood, say, about $\frac{1}{4}$ in. thick, and is fitted into slots made in the ends of the mitred joints by sawing and chiselling. The grain of the key is set to run parallel with one of its edges, with the result that when fitted in place it has the greatest strength.

The keyed dovetailed mitre joint in Fig. 3 is suitable for framing intended to withstand considerable stress, and is simply an ordinary mitred joint with a double dovetail formed across it. Into the double dovetail a piece of X-shaped hardwood is fitted; when this is pressed into its place in the slots which are cut for the purpose, the joint is firmly held.



measured to some angle across the length of the moulding. There are various ways by which this angle may be determined. It can be ascertained by calculation, but the simplest method for the amateur is to make a full or scale size drawing of the parts to be mitred. This drawing need not be anything more elaborate than a series of parallel lines, the spaces being equal in width to the width of the moulding to be cut.

An example is given in Fig. 1, and from this it will be seen that the parallel lines representing the mitreing intersect at the corner, or angles, as at A, B, and C. The correct angle to cut the mitre is determined by joining the intersections of the two inner lines to that of the two outer lines, as at D, C. Having ascertained this angle, the bevel square is set to it, and the angle marked upon the moulding, which is then sawn off, and the ends planed or shot true.

In this work, the lengths of all mitreings may be measured to the inside or from the outside, the latter being usually the most convenient method. Fig. 4 shows how the mitre is marked with the bevel square. To facilitate marking a standard mitre template can be used. This is a combination of a mitre template and a square. It can be purchased, or a similar instrument made up from a piece of wood. The wooden template is simply a piece of wood with a lip, or guide surface, upon it and the ends accurately mitred to the angles desired.

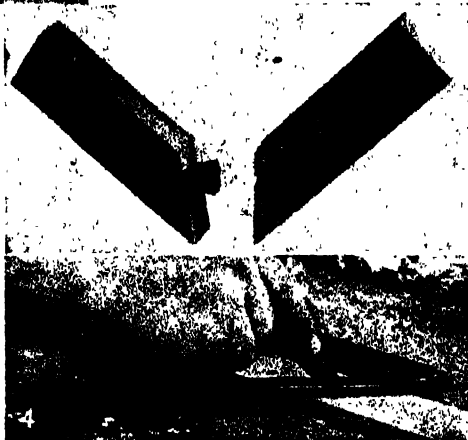
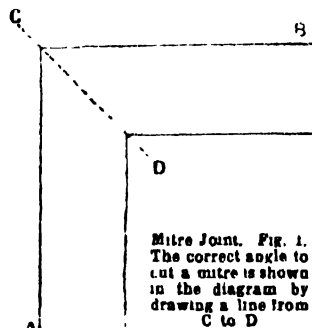
Mitre Box. A box for the cutting of material up to 5 in. square can be made from

3 pieces of deal, planed up true on the faces and edges and measuring 6 in. wide and 1 in. thick. The length of the 3 pieces should be about 2 ft. (Fig. 6 gives the dimensions.) The pieces are nailed together to form a trough-shaped open box (Fig. 5). Two battens, 2 in. wide and about $\frac{1}{2}$ in. thick, are nailed across the tops of the side pieces to keep them from spreading or opening but before finally fixing them it is necessary to test the uprightness of the side pieces, as the angle between them and the baseboard must be exactly 90°. This testing is done by placing a set square on the box and adjusting until the sides are correct, when the battens may be fastened.

The next step is to mark out the sides for the cuts which guide the saw while cutting the moulding. Mark off in the centre of the block a line at right angles to the length of the box; project this line to the face of each of the side pieces, and saw through to this line. Then set a bevel square exactly at 45°, mark this angle on the upper edges

of the side pieces, square off on each of the outer sides of the side pieces, and again saw through. Repeat this operation on the opposite hand, and the mitre box is complete and ready for use. Fig. 6 shows the plan of the box and the correct angles marked out. Fig. 5 shows how the hand saw should be held in sawing the moulding, and how it works through the saw-cuts.

The moulding to be cut is pressed into the lower corner of the box and held with the

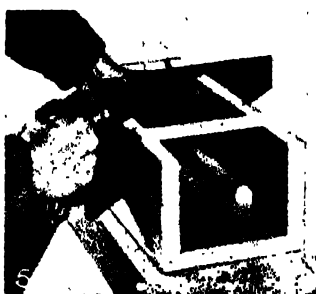


Mitre Joint. Fig. 2. Keyed mitre joint shown separated. Fig. 3. Key in place in one half of a dovetail mitre joint. Fig. 4. Mitre angle being marked on the moulding with a bevel square.

left hand while the saw is manipulated with the right.

A mitre block, useful for cutting small mouldings, is illustrated in Figs. 7, 8, and 9. It may be composed of a baseboard, 18 in. long, 6 in. wide, and 1 in. thick, and a second board of the same length, about 3 in. wide and about 1 1/2 in. thick, which is glued and doweled to the baseboard. It is marked off with angles and sawn through as before. This type is used in a similar manner to the mitre box. The first pattern is generally more convenient for amateur use, as it keeps the saw upright.

If it is intended to use either of these blocks for a great deal of work, an improvement



Mitre Box. Fig. 5. Home made mitre box in use

fence. The plane is pushed up and down with the right hand and the moulding fed towards it, thereby cutting the end of the moulding and producing a surface which is flat, but is inclined at the same angle as that of the guide piece or template.

Guide pieces or blocks can be made to any desired angle and interchanged according to requirements. If the board is intended for regular use it should be grooved on the underside of the baseboard and have strong batten screws to it to prevent it warping or winding; when not in use it should be hung up, and given a precautionary coat of varnish or paint.

MITTENS. Knitted mittens for men may be worked in a good 5 ply fingering, which makes them comfortable in wear, yet warm and strong enough to be worn for ordinary sports, and for shooting and motoring when it is desirable to have the fingers free and uncovered.

To make a pair big enough to fit a hand that usually takes size 8 in kid, 3 oz. White Heather 5 ply fingering will be required, with No. 14 steel knitting needles. The one illustrated had the top of the hand and the top of the thumb where the single ribbing occurs worked with needles one size smaller than the rest of the mitten. This helps to close them to the hand, but it is not absolutely necessary to use other needles if they are not at hand, as the ribbing serves the same purpose.

How to Knit. To begin, cast 24 stitches on each of 3 needles, making 72 altogether. Join them into a round as for stocking knitting, and work a plain round through the back of the stitches to give a firm edge. For the wristlet, work in ribbing consisting of knit 2 stitches and purl 2 stitches alternately all round; this is known as double rib, to distinguish it from the single rib at the top of the mitten, which consists of knit 1 stitch and purl 1 all round. Repeat the double rib for 32 rounds, then knit a

plain round, taking together every fifth and sixth stitches to reduce the round to 60 stitches. Knit 6 more plain rounds for the hand on these 60 stitches, then begin the making of the thumb gusset.

Arrange the stitches on the needles as follows: 24 on each of 2 needles and 12 on the third, which is the gusset needle. The first round begins on the needle containing 12 stitches, and is worked as follows: Knit 12, then lift up the loop right under this last stitch and knit it; finish the round plain. Now knit 3 rounds without any increase on the gusset. For the fifth round, knit 12 stitches on the gusset needle, lift up the loop below the 12th stitch and knit it. Now lift up the loop below the last stitch on the needle and knit it, then knit the last stitch. Finish this round plain, then do three more complete rounds plain. In the next round increase again after the 12th stitch, and again below the last stitch before knitting the latter off the needle. Continue working in this way with three rounds between every increase round, until there are 29 stitches on the gusset needle altogether. This completes the thumb gusset.

The top of the hand is now continued above the thumb. To divide the thumb stitches, first knit 11 stitches off the gusset needle, and pass the remaining 18 stitches on a safety pin to put them aside for the present. Cast 4 stitches on the same gusset needle, and these will come at the back of the thumb, and link up the hand

stitches into a complete round. Knit the remainder of the stitches in the round, then knit 18 rounds of plain knitting on all these stitches. Finally do 10 rounds of single ribbing to close in the top of the mitten, and cast off fairly loosely, so that the edge is not too tight. To complete the thumb, take the stitches off safety pin and divide them equally between two needles, then lift up 4



Mittens. Man's knitted mitten for use when shooting or motoring

stitches at the back of the thumb, where they were cast on before, putting the needle through the edge of these 4 stitches and knitting the loop so picked up. Join these stitches into a round and knit 6 rounds plain. In the next round knit together the second and the third of the 4 stitches that have been picked up at the back of the thumb and do 5 rounds of single ribbing to match the top of the hand, and cast off. The second mitten is the same, as they are reversible. See Glove.

MIXED GRILL. provided by cooking

A good mixed grill is together in front of a clear fire or beneath a gas or electric grill a sheep's kidney, a slice of bacon, a chop or a piece of steak, and two or three mushrooms, or a tomato. Trim the chop or steak neatly,

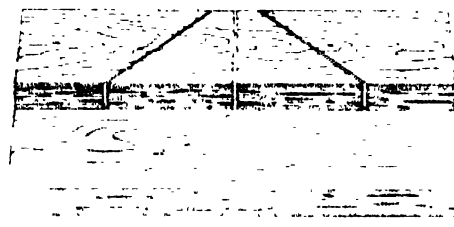
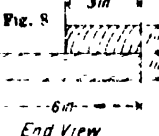
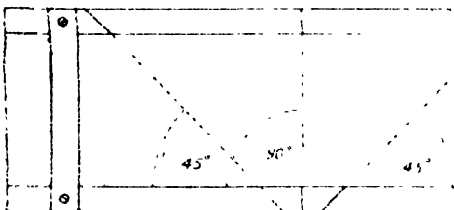


Fig. 7



End View

Fig. 6

Fig. 8. Plan of mitre box, showing correct angles. Fig. 7. Solid mitre block. Fig. 8. Section of block, showing necessary measurements

is to line the guide faces with strips of brass, to prevent the sides of the saw wearing away the material and thereby making it inaccurate and unreliable in use.

Mitre Shooting Board. After moulding has been sawn to the requisite angle to make



the mitre, the end of the material is planed up true with a mitre shooting board, as in Fig. 10. This appliance may be made from a piece of deal about 9 in. wide and 1 in. thick, to one side of which is glued and doweled a narrower

board about 3 in. wide and 1 in. thick. At the extreme left-hand end a third block is glued and screwed with its edge exactly at right angles to that of the "fence" or guide batten. This third block is used for accurately shooting the end grain of the wood at 90°.



Fig. 9. Solid mitre block showing method of use. Fig. 10. Planing up the mitre joint. Fig. 11. Mitre shooting board used for planing

cut open the kidney and remove the skin and core, peel the mushrooms or cut the tomato in half. Brush all over with a little melted butter, and sprinkle them with pepper. Rub the gridiron with a piece of suet and heat it.

Cook the meat for 10 or 15 minutes, adding the mushrooms when it is half done. Serve the grill on a hot dish, with a little lemon juice sprinkled on each mushroom. See Grilling.

MOCASSIN: How to Make. The N. American Indian word mocassin describes a

style of beelless slipper. As worn by the Indians, it is made of deerskin and ornamented with embroidery and beadwork. Mocassins are easily made at home. Soft suede, which can be bought in many colours, is a suitable material. The lining can be of lamb's wool, or any soft, fleecy woollen material, while appliqué suede flowers in contrasting colours or coloured beads are effective for decorating.

Mocassins are made in one piece, which is cut large enough to cover the sole of the foot and to draw up round the instep. To make them from suede, procure two good-sized skins of the desired shade. Use the sole of a shoe as a guide in cutting out and cut the skins in an oval about 3 in. larger than the sole all the way round. Punch holes $\frac{1}{2}$ in. apart with a stiletto round the edges and cut some thin strips of the suede, about $\frac{1}{4}$ in. thick. Thread these in and out of the holes, leaving plenty of length of the suede as draw strings. Put the foot into the flat part and draw up the suede strings round the instep, fastening securely when the right aperture is secured.

The mocassin should fit snugly and yet be loose enough to allow the foot easily to be slipped in. If the size should be too big, make the mocassin smaller by punching an inner series of holes and drawing the thread through these, cutting away the surplus material. The fullness should be arranged to come at the toe end and at the heel. If preferred, instead of gathers at the back, the fullness can be folded in two pleats, or a slit can be made and a triangular piece cut out, the ends being neatly drawn together with strong thread.

When the mocassin fits correctly, cut out in the same way a piece of rabbit fur for lining, making it about 1 in. larger than the suede. Pin it, or tack it over in pleats, to make it the same size in the foot, then cut away the surplus fur underneath the pleats and sew the pieces securely together, on the wrong side.

Next turn the fur right side out and slip it into the suede mocassin, allowing the fur edges to overlap the suede and to form an edging. Cut out a triangle of suede to cover the toe front and nick this along the edges to make a fringe. Tack this on to the top of the mocassin to neaten the part that has been gathered, using a contrasting coloured thread. This triangle can be trimmed with beads, or have a design cut out and a strip of brightly coloured suede slipped underneath to show the pattern.

If lambewool or any woollen material is used as a lining, the two edges should be sewn together, and bound with ribbon or narrow fur. Mocassins can also be made from coloured pigskin and decorated with poker work. The toe piece has a suitable design traced on it. This is outlined in poker work and afterwards coloured.

The mocassins illustrated are thonged round the toe piece, and this is attached to the main

part of the shoe, which is finished by thonging and lined with velour.

Heavy wool-backed velour, the kind of which curtains and furnishing coverings are made, is a suitable material for mocassins.

Mocassins made in this way look well lined with the same material, so that the velour should be cut out and made to fit the foot on the wrong side as well as on the right side. Stitch all the pieces firmly in position, then slip the lining right side out and into the outside



Mocassin. Pair of mocassins of coloured pigskin, decorated in poker work and lined with silk

piece. Sew the edges together and bind them with a ribbon ruching or narrow fur. Cut out a single triangle in velour for the top piece and embroider this boldly in thick wool or chenille, then tack it in position. See Leather: Poker Work.

MOCHA: The Coffee. Mocha is a variety of Arabian coffee, excellent in flavour and quality, which is used in the

same way as other varieties of coffee, but rather less is required, as the flavour is strong. The name of mocha is often given to cakes, biscuits, etc., in which coffee flavouring is used. See Coffee, Coffee Cream Sandwich.

MOCHA: The Glove Leather. Real Mocha leather, as used for gloves, is a strong heavy skin prepared with a soft, velvety surface and wears better than suede, with which it is sometimes confused. Suede is glove leather finished flesh-side out, but in mocha the hair side is uppermost, although the grain surface is rubbed away.

Mocha is an especially suitable material for men's and winter gloves, for slippers, tobacco pouches, sports coats, and aviation clothing. Its freshness can be renewed by the use of a wire-bristled brush. Mocha is obtainable in several colours, and especially in brown shades. See Glove; Leather: Tobacco Pouch, etc.

MOCHA FINGER. To make the iced, finger-shaped cakes known as mocha fingers, break 2 eggs into a basin, add to them 3 oz. castor sugar, and whisk them well for about 10 min. or until they are thick. Fold in $\frac{1}{2}$ lb. sieved flour, adding a little milk if required, and put the mixture into some well-greased tins.

Bake the cakes in a hot oven until they are of a pale biscuit tint, and leave them to cool on a sieve before coating them with coffee icing. A small piece of hotted walnut may be placed in the centre of each cake. See Coffee Icing.

MOCK HARE. To make this, fry 3 oz. bac out into dice in a stewpan, and when it is lightly browned add $1\frac{1}{2}$ lb. stewing beef, cut into small pieces and coat with seasoned flour. Continue frying for a few minutes, then add $\frac{1}{2}$ pint stock, a bouquet garni, some grated lemon rind, and an onion stuck with cloves. Stew all slowly in a covered pan until the beef is tender, then put in a wineglassful of port, some lemon juice and red currant jelly and serve it with forcemeat balls. See Bouquet Garni; Forcemeat.

MOCK ORANGE. This is one of the loveliest of all hardy flowering shrubs. Its botanical name is *Philadelphus*. It is often miscalled syringa. The mock orange flourishes in well tilled soil, flowers in early summer and is increased by cuttings inserted out of doors in autumn. The common mock orange (*coronarius*) grows 10-12 ft. high, and bears white fragrant flowers; *grandiflorus* has finer flowers but they have little scent. In recent years many beautiful cross-bred

mock oranges of less vigorous growth have been raised; they are ideal flowering shrubs. Some of the best are *Virginal*, *Rosace*, *Bouquet Blanc* and *Dame Blanche*, all bearing white double flowers. *Lemoncel*, a slender growing shrub 4 ft. high, bears small white flowers freely. These newer kinds must be pruned as soon as the flowers have faded by cutting out old branches and shortening others to where fresh strong shoots are developing.

MOCK TURTLE SOUP. Blanch half a calf's head for 10 min., put it into a stewpan with a gammon rasher cut into dice and about 2 lb. knuckle of veal, well chopped, 2 carrots, 2 turnips, 2 leeks, $\frac{1}{2}$ head celery, or a teaspoonful of celery seed tied in muslin, an onion stuffed with 2 cloves, a bouquet garni and 2 shallots. Add 3 quarts cold water and set the soup to boil; skim it well and let it simmer gently for about 3 hours.

When the head is tender remove the pan from the heat. Take up the head on to a dish and bone it, removing the tongue. Strain the stock and put it on to boil, and while it is heating up brown 2 oz. flour with $1\frac{1}{2}$ oz. butter in a small saucepan; stir continually with a wooden spoon, and when it is a dark brown colour mix in by degrees sufficient of the hot stock to make a thin paste. Pour this to the stock, which should now be boiling, and cook for 5 min., stirring all the time. Remove the scum as it rises.

Add 2 glasses sherry, the juice of $\frac{1}{2}$ a lemon, and seasoning to taste. Cut about half the meat from the head into dice, lay these in a tureen and pour over them the boiling soup.

Mock turtle soup may also be served clear, in which case follow the above recipe, but omit the butter and flour. Also after the stock is made it must be allowed to get cold so that every particle of fat may be removed. It should be clarified as described for clear soup. See Soup.

MODELLING. The modelling of animals is an attractive pastime. Bears, lions, and many other animals can be sawn to shape from thin pieces of wood, provided with separate legs obtained from similar pieces, and assembled together. They should be very strongly made, and all the joints well glued and pinned together. Bright colours and simple outlines should be the guiding features.

Plastine, plaster, and similar materials also lend themselves to the construction of toys. Modelling in cork may also be included and may comprise nothing more elaborate than a few quaint figures oil painted, or may



Mock Orange. Fragrant white blooms and glossy leaves of this beautiful hardy flowering shrub

take the form of a model of a house, bridge, or any other building made up from small pieces of cork fixed together with secotine and pins.

The use of large pieces of cork, together with other materials, such as cardboard, stiff paper, brown paper, green baize, and linen, enables more ambitious work to be carried out. Particularly interesting is the modelling to scale of an old village. Paper pulp, made by soaking old newspapers and then thoroughly straining out the water, provides a material, when mixed with gum, that can be modelled into shapes that are difficult to obtain in any other way. Further particulars are given in the article on *Papier Mâché*.

An interesting occupation is to reproduce to a small scale either a favourite seaside resort or some notable or historic scene. In carrying out this work, cork should be the main material used, as it is easily shaped with a sharp knife. Large pieces of work may be modelled in sections and glued together, and if the surface of the material is coated with size, oil paints can be employed with considerable effect.

Another excellent material for modelling is chalk, which is obtainable quite easily in many parts of the country. It can be cut to all sorts of shapes with no other tool than a penknife, and it forms an ideal material for relief carving. Scale models of stone buildings may be made by using sawn blocks of chalk; a fine tenon saw will serve, and the surfaces can be joined by first coating them with size and applying secotine when dry.

The chalk can be stained and coloured with water colour. Various stages in the development of architecture may be shown by utilizing cork and chalk and the materials may be combined in making scale models of famous buildings and old ruins. If chalk in blocks is not readily obtainable, a good substitute, easily worked, can be made from plaster of Paris mixed with water and poured into rough moulds. Gesso and barbsol paste can also be used for this purpose.

Modelling Wax. For modelling flowers and fruits pure beeswax is used with a small proportion of lard or olive oil. The wax employed for kindergarten purposes contains beeswax, paraffin wax, sesame oil and sulphur. See *Gesso*; *Papier Mâché*; *Sealing Wax*.

MODILLION. This is a word used in architecture to describe a block or bracket used beneath a Corinthian or other cornice, and when so used it is generally enriched or modelled. When employed in a cornice of the Roman-Ionic order, it is plainer in character, to suit its surroundings. See *Capping*.

MODULATION. In wireless telephony, this is the procedure whereby oscillations of audible frequency (speech, music, etc.) are caused to vary the amplitude of the carrier wave (e.g. that sent out by a broadcast transmitter). See *Carrier Wave*; *Microphone*; *Telephone*.

MOELLON. A mixture used in mason's work, and composed of rubble, stone, and mortar, is known as moellon. It is employed as a filling to fill up the cavities between two wall faces built with blocks of stone.

MOHAIR: The Fabric. Properly used, the term mohair signifies yarn or fabric made from the hair of the Angora goat. The fabric resembles alpaca, though somewhat coarser. Mohair goods are familiar in several forms, and at one time the braids used on coats and costumes were of this material, instead of artificial silk, as at present. The bootlaces described as mohair are actually cotton. Mohair mats and door slips are much used, and most astrakhan, Persian lamb, Teddy bear fabrics and imitation tiger skin rugs are mohair.

As a dress stuff mohair is generally made with half cotton, and although cool, clean, bright and durable, it is somewhat stiff and

not suitable for draped dresses. Manufactured by a special process, mohair and mohair and wool dress goods can be made more lissom. Mats and rugs are often made partly in plain and partly in curled plush. When used as door rugs the material is sewn upon a heavy jute backing. Mohair plush travelling and motor rugs wear well, take little damage from wetting, and dust is easily shaken from them. Upholstery mohair fabrics are durable and possess a good dust-resisting surface. See *Bootlace*; *Upholstery*.

MOIRÉ. In order to see a moiré appearance take any light, plain, open-textured fabric like thin silk or cambrie, fold it lightly and hold the doubled material up to a good light. An irregularly clouded figure formed by the crossing of the lines will be seen. These markings, or waterings as they are called, can be permanently fixed upon suitable cloths. Goods with ribbed surfaces give the best results, and the larger and less uniform these figures are the more they are admired.

The markings are made by laying one wet surface of cloth over another and using very heavy pressure to impress the ribbedness of one surface upon the other. That is not the only method, for moiré markings of a less uneven character are obtainable by embossing the cloth between engraved, countersunk rollers under heavy pressure. Moiré markings are seen on silk ribbons and dress silks, on velvet, worsted moreens and the cotton material known as moirette, as well as on bookbinding cloths.

MOLASSES. This is very thick, black liquor remaining after the removal of the crystallisable sugar at the refinery. To a very small extent molasses is used as medicine. Chiefly it is used as cattle food, and it has important industrial applications. Fermented and distilled, it is the raw material for industrial alcohol and its derivatives, such as acetone, acetic acid, butyl alcohol, and the acetate solvents. It is also used for making yeast, and citric acid.

The bulk of world supplies come from Cuba. Some from the British West Indies, and from sugar refineries in the U.K.

MOLE: The Fur. This is not a hard-wearing fur, the leather being very thin, but what it loses in wear is compensated to some extent by the artistic shapes into which its pliancy and softness allow it to be made. Moleskin may be cleaned by means of hot bran

which is rubbed in with the tips of the fingers. For cutting the skins of the mole an extremely sharp knife should be utilized, the skin split up the belly, the head and feet cut off, when the carcass can be readily removed. The skin, freed of dirt and blood, should be stretched on a board, fur side under, and fastened at the corners with tacks. It should be allowed to dry, and when a sufficient quantity has been collected the skins should be sent to a furrier to be dressed. See *Fur*.

MOLE: On the Skin. Certain tumour formations in the skin are known as moles. In one form they exist as slight elevations of the skin of a light brown to a black colour, and are not infrequently the site of hairs.

Several ways of removal of moles are available to the surgeon, including carbolic acid snow, electrolysis, X-rays, and excision.

It cannot be too strongly emphasized, however, that any attempt at home treatment of moles by caustics or any similar means is most dangerous, nearly always increasing the disfigurement, and possibly converting it into a malignant growth.

See *Birthmark*; *Electrolysis*.

MOLE: In the Garden. Generally the mole is of service to agriculture as an exterminator of grubs, slugs, wireworms, and other harmful things, but it can only be regarded as a pest where the flower or vegetable garden is concerned. Unless quickly caught it will cause great harm, particularly among rows of potatoes or other vegetables growing in well manured, loose drills of soil.

The best way to capture moles is by means of an iron mole trap, seeking the run with a spade, and setting the trap across with a covering of earth. When handling the trap gloves must be worn, otherwise moles, with their acute sense of smell, will avoid the trapped run, and take to another. It is useless to place the trap in a mole-hill. Another remedy is to make holes here and there with a dibber, drop in pieces of carbide, filling the holes with soil packed fairly tight. Dogs, such as the sharp fox terrier, may quickly be trained to watch for moles at work.

The animals usually work at 2 a.m., 6 a.m., and again at 9 p.m. Round about these times their heaving up of earth may be noticed; but the watcher must approach his quarry very gently, as they are extremely sensitive to vibration and smell.

MOLE CRICKET. This fierce-looking insect with lobster-like head and clawed forefoot is sometimes seen in the garden. It lacerates the roots of plants as it burrows with its mole-like forelegs. It may be drowned with paraffin emulsion poured down its holes. In some localities a thin stick is thrust down, and often the insect will grasp this, allowing itself to be drawn to the surface and killed.

MOMORDICA. These climbing plants are valued for the sake of their ornamental fruits, which are suitable for cultivation in a hothouse. They are raised from seeds sown under glass in spring, grown in large flower pots or planted in a border of soil and trained on a trellis or other support. The balsam apple (*Momordica balsamina*), an annual with orange coloured fruits, is one of the chief species.

MONARCH OF THE EAST. This is a half-hardy tuberous rooted plant (*Sauromatum guttatum*), which will flower on the mantelshelf of a living-room. The inflorescence is in the form of a greenish-purple spathe, somewhat similar to that of the arum lily. The tuber should be purchased in the autumn and will then come into bloom during winter or early spring. When the stem has died down the tuber should be potted or it may be planted out of doors for the summer months. The leaves will then develop. When these have died down the tuber is taken out of the soil and again placed on the mantelshelf.



Momordica. Climbing plant with ornamental foliage and reddish fruit, also known as balsam apple

MONARDA. This is the botanical name of a scented-leaved hardy herbaceous perennial, known as sweet bergamot and bee balm. See Bergamot.

MONEY ORDER. In Great Britain money can be sent through the ordinary post by means of money orders and postal orders. Money orders are more suitable for uneven sums of money, such as £2 7s 8d., and for comparatively large ones. They can be purchased from any post office that is also a money order office, for any amount up to £50. The charges for an order are: up to £10, 8d.; £10 to £20, 10d.; £20 to £30, 1s. 0d.; £30 to £40, 1s. 2d.; £40 to £50, 1s. 4d. Limit to the Irish Republic is £40.

An order is made payable at a particular money order office, and there the person to whom the money is sent must go to obtain it. On giving his name, the amount of the order, and other particulars, it will be paid. Money orders can be sent by telegraph from any money order office, the extra charge being the cost of the telegram and 3d.

Money orders can also be sent to nearly all parts of the British Empire and to France, Italy, and other European countries, also to the U.S.A. and Japan. The charges vary, but particulars can be obtained from any post office. To certain countries money orders can be sent by telegram. See Postal Order.

MONEYWORT. This is the popular name of *Silthorpa europaea*, a hardy creeping plant with small, pale pink, snapdragon-like flowers in summer. A shady place in the rock garden is suitable, or it and the coloured-leaved varieties may be grown in suspended pots or baskets in the greenhouse. Propagation is by division in spring.

Monkey Flower. This is another name for the plant usually known as musk (q.v.).

MONKEY FUR. Used almost solely for trimming, this has a shaggy appearance, and takes the form of narrow strips which may be purchased by the yard. Like all other dark-coloured skins, monkey fur may be cleaned by means of silver sand.



Monkshead. Free-flowering garden plant. See article above.

also the plant itself are used as cattle food

MONKEY PUZZLE TREE. The name of monkey puzzle is given to a cone-bearing tree, *Araucaria imbricata*, with wide-spreading branches, which curve upward. The foliage is stiff and sharp at the edges. This tree thrives best in country gardens in deep loamy soil. It is apt to lose its lower branches in towns and suburbs. The only other *Araucaria* which is cultivated in Great Britain is *A. excelsa*, the Norfolk Island Pine (q.v.); small specimens make good room plants.

MONKSHOOD. Monkshead is the common name which is given to aconite by reason of its hooded flowers. Although poisonous in all its parts, monkshood is an attractive and free-flowering perennial of distinct value in the garden, especially in shady places. The common blue monkshood is *Aconitum napellus*; the blue and white variety, bicolor, is more attractive. Wilson and Fischer are other good blue monkshoods. The plants, which grow 3-5 ft. high, should be left undisturbed, as they are slow in establishing themselves. See Aconite; also illus. below.

MONOGRAM.

Two or more capital letters combined in one form what is termed a monogram. A good example of this is seen in the diphthong *EL*. Initials formed into a monogram and cut out in thin tin or zinc can be used for marking linen, books, etc. Another method is to engrave or etch the monogram on silver.

In designing a monogram, legibility must be considered, and in arranging initials it is often advisable to give prominence to the initial letter of the surname; this may be effected by enlarging the letter or by utilizing colour. Roman lettering lends itself to artistic arrangements, the best method being to commence with the principal letter, work out as many combinations as possible, and then decide on the best. A symmetrical letter is the easiest to commence with, and where other letters can be arranged in an O or C, the work will be comparatively simple. Some combinations of letters are very awkward to arrange, but it is generally only a matter of practice.

Examples of two and three letter symmetrical as well as non-symmetrical arrangements are illustrated. All the examples are suitable for stencil cutting, but care must be taken to arrange the ties between the letters. Monograms are quite as effective in embroidery as initial letters, the method employed in stitching being the same. Interlaced letters as the O entwined, or the C placed back to back, are often mistaken for monograms, but they are ciphers. See Initial; Lettering; Stencilling.

MONSTERA. Only one species of this evergreen climbing hot-house plant, *Monstera deliciosa*, is usually cultivated. It has large green, lace-like leaves and many surface roots; the flowers, which come in summer-time, are yellow, and are followed by fruits. The plants require a damp, warm position in the heated house, in the usual mixture, and should be inserted in springtime. They require liberal syringing during the summer months, and may be propagated by cuttings.

MONTBRETIA. This is a splendid late summer flower in shades of orange, orange-crimson and yellow. The flowers are in spikes which rise above the iris-like leaves. The older kinds, e.g. *crocasmiaeflora* and *Pottii*, may be planted out of doors in spring and left undisturbed for several years until they become overcrowded; they ought then to be lifted, divided and replanted in autumn. Recently many handsome new large-flowered varieties have been raised; it is usual to start the corms of these into growth in pots

of soil placed in a frame in March and to plant them out of doors in May. They should be lifted and stored for the winter to obtain the finest results. A few of the best of the newer sorts are His Majesty, crimson and old gold; Goldfinch, yellow; Lemon Queen, pale yellow; Marjorie, orange-yellow and crimson. There are numerous others. *Montbretia* thrive in ordinary well-tilled soil; on heavy land leaf-mould and sand should be mixed in.

MONTEITH.

The name is given to a vessel made in the eighteenth century, and used for cooling wine glasses. Not unlike a punch-bowl, it is usually of silver, and has a scalloped edge and a movable or open-work rim. See Punch Bowl.

MONTH.

This is a period of time. There are 12 months in the year, known as calendar months, to distinguish them from the period of 4 weeks, which is known as a lunar month. The number of days in each calendar month is as follows:

Jan. 31	May 31	Sept. 30
Feb. 28 or 29	June 30	Oct. 31
March 31	July 31	Nov. 30
April 30	Aug. 31	Dec. 31

Legally a month usually means a calendar month. A person whose salary is paid by the month receives 12 payments a year, receiving the same amount for the 28 days of February as for the 31 of March. Likewise a person who gives or receives a month's notice must reckon it, not as four weeks, but as a calendar month. A notice given on Feb. 19 takes effect on March 19, and so on. Each of the months has certain special features for the gardener and the housewife, and these are given in this



Montbretia. Hardy plant with brilliantly coloured flowers ranging from red to pale yellow.

work under the various headings. See April, Calendar; February; March, etc.

Monthly Rose. This is another name for the China rose. See China Rose; Rose.

MOODS: The Game. The game of moods affords a pleasant variant at parties, especially those for adults or elder children. One person leaves the room, and the others decide what mood they will be in. They may choose a laughing mood, an insolent mood, a sorrowful mood, or any other. Then the person outside returns and asks questions from the players in turn, the object being to find out from his method of answering what mood has been chosen. When he has guessed correctly another player takes his place. Any question is permissible. The game is also known as adverbs.

MOON DAISY. The moon daisy (*Pyrethrum (chrysanthemum) telmiosum*) will grow almost anywhere under any conditions, reaching a height of 4 ft., and flowering profusely with large daisy-like flowers during late summer. It is excellent for garden decoration or for yielding flowers for cutting. It should be planted in autumn or spring, and increased by division of roots during the same periods. It is advisable to lift roots and divide them every three years. See *Chrysanthemum*; Daisy.

MOONSEED. The leaves of the moonseed, or *Menispermum*, are not unlike those of the ivy. The plant is a hardy flowering climber with yellow blossoms in summer and grape-like black fruits later on. *Menispermum canadense* is of rapid growth, and suitable for covering walls, arbours, fences, pergolas, trellises, etc. Moonseed thrives in almost any soil and situation, and is propagated by cuttings or division of the roots. It should be pruned early in the year.

MOONWORT. *Soldanella*, or moonwort, is a family of rock garden plants of the primula order, with bell-shaped, nodding, fringed flowers in spring; height about 3 in.



Moonwort. Bell-shaped flowers of this Alpine plant

The favourite is *Soldanella alpina*, with violet-coloured flowers; *pusilla* has blooms of similar colour. The moonworts like a compost of loam and peat with sand. They are best suited by a damp position, and will not thrive on a hot, dry site. They should be protected by raised pieces of glass in

winter to keep off excessive rains. Propagation is by division in the case of strong tufts in September. The plants may be raised from seed sown in a frame when ripe.

MOP: For House Work. There is a use for mops of all sizes in the ordinary household. Most people are familiar with the long-handled type, invaluable for dusting and polishing floors and wainscot. Such mops, if well shaken after use, do not need washing often.

A small mop, the head of which is made of unbleached cotton, soft and absorbent, may be used for washing up. It saves the hands, and is particularly useful for cleaning jugs or cups or any kind of fluted work. These mops should be treated like dishcloths, and be washed



Moon Daisy. Profusely flowering plant useful both for garden borders and for house decoration

in soda-water after use, and hung up to dry. Their cost is so moderate that they can be replaced frequently, and there is no need for them to grow dirty or straggly. They are usually provided with a loop at the end of the handle by which they can be suspended above the sink.

MORaine GARDENING. The possession of a moraine, which, in gardens, is a mixture 12-18 in. deep of stones with a little sifted soil added, enables the gardener to cultivate certain difficult high alpine plants with greater success than is possible in the rock garden proper. The reason is that the perfect drainage afforded by the moraine keeps the plants reasonably dry in winter yet conserves the moisture in summer. Such difficult alpine plants as *entrichium*, *Gentiana verna*, *Dianthus alpinus* and others should be planted in a moraine; there also the silvery saxifrages, dwarf campanulas and others flourish.

MOREEN. Shiny on the underside, ribbed and with wavy moué markings on the upper surface, moreen is usually self-coloured. Both moreen and mouette can be used with good effect to make blotting-book covers, stout curtains for cupboards and alcoves, and they wear well as covers for cushions and chairs. See *Moué*.

MOREL. The edible fungus morel, similar to the mushroom in appearance, is considered by epicures to be superior to it in flavour. See *Mushroom*.

MORELLO CHERRY. The dark-red morello cherry flourishes in chalky soil and may be grown as a standard in the open or against a north wall. The morello cherry is not suitable for dessert purposes, as its acids never turn to sugar so completely as they do in other varieties, and its flavour is not pleasing to the palate. See *Cherry*; *Cherry Brandy*; *Fruit*.

MORINA. The chief species of the hardy herbaceous perennial morina is *longifolia*. This has thistle-like, spine-edged leaves and whorls of purple flowers in summer; its height is about 2 ft. It likes a friable soil. Propagation is by division in autumn or spring, or by seeds. See *illus. above*.

MORNING GLORY. A twining, climbing, annual plant, *Ipomoea purpurea*, member of the *convolvulus* (q.v.) family. The leaves are heart-shaped. The large funnel-shaped flowers are purple. It needs a warm and sunny spot.

MORNING ROOM. As its name implies, the morning room serves the purpose of a

breakfast room or a sitting room in the early part of the day.

A morning room should face south east, more east than south, so as to make the most of the morning sunshine. Its furniture may consist of a round or oval table for breakfast or an informal lunch, a bureau for correspondence and the keeping of the household books, a firm table which can be used for sewing, a cupboard for keeping needlework and odds and ends, or an oak chest, and a couple of comfortable chairs in addition to those needed for the table. See *Sitting Room*.

MORNING SICKNESS. One of the earliest signs of pregnancy is sickness, which commonly occurs when the patient rises. It commences towards the end of the first month, and continues for a month or two, not usually lasting beyond the fourth month. Sometimes it occurs in the evenings, and at times the sickness may continue throughout the day. In that case medical treatment is necessary.

In ordinary cases no treatment is called for. It is a good practice, however, to take a tumbler of hot water or a cup of very weak tea on awakening, and to remain in bed for an hour afterwards. If constipation exists, a purgative should be taken occasionally. A useful laxative consists of 1 oz. each of confection of sulphur and confection of senna.

MOROCCO. This is a variety of leather. Originally it was made from goat skin by the Moors, and won a great reputation owing to the way in which it was prepared, one point being that it was dyed before it was tanned. To-day, in addition to genuine morocco made from goat skins, there is imitation morocco



Morina. Thistle-like foliage and purple flower of the species *longifolia*. See article below



Morning Glory. * Specimen of the flowers produced by this climbing plant

made from calf skins and sheep skins. Indeed, owing to the fact that the graining and finish, which are the distinctive mark of morocco, can be imitated by machinery, morocco can be made from all varieties of thin leather. It is used, among other things, for binding books, handbags, and covering furniture. See Leather; Upholstery.

MORSE CODE. This is a system of signals for radio, telegraphic or visual communication, whereby letters of the alphabet, numerals, punctuation marks, etc., are transmitted either as a series of dots or dashes, or as a combination of both.

A dash, which can be expressed phonetically as di, is of longer duration than a dot, which can be expressed phonetically as di, being equal in length to three dots. The time interval between signals which together make up any particular letter is equal to one dot. The interval between any two letters is equal to a dash or three dots, and the interval between any two words is equal in duration to five dots. Full details of the various signals and abbreviations used in radio are given in the Handbook for Wireless Telegraph Operators published by H.M. Stationery Office and obtained through any bookseller.

INTERNATIONAL MORSE CODE SIGNALS

a	.-	1	....
b	-...-	2	..-.-
c	-.-.-	3	...--
ch	-.-.-	4-
d	-.-.	5	.....
e	..	6	.....
f	..-.-	7	.....
g	...-	8	.....
h	....	9	.....
i	..	0	.....
j	.-.-.-		
k	.-.-		
l	.-.-.-		
m	---		
n	..-		
o	---		
p	.-.-.-		
q	.-.-.-		
Full stop [.] .. -.-			
Double dash [-] .. -.-			
Comma [,] .. -.-			
Colon [:] .. -.-			
Question mark [?] .. -.-			
(Also request for repetition of anything which is not understood.)			
Exclamation mark [!] .. -.-			
Apostrophe ['] .. -.-			
Hyphen [-] .. -.-			
Fraction bar [/] .. -.-			
Parentheses [()] .. -.-			
Inverted commas [" "] .. -.-			
Underline .. -.-			
Break signal .. -.-			
Error (series of dots) .. -.-			
End of transmission .. -.-			
Invitation to transmit .. -.-			
Wait .. -.-			
End of work .. -.-			
Commencing signal .. -.-			
Understood .. -.-			

MORTAR. Mortar is a mixture of lime and sand, or similar materials used for making the joints between brickwork and in numerous other building operations. Its purpose is three-fold: to distribute the pressure or weight through the brickwork, to cause the bricks to adhere, or bind together, and as a non-conductor, preventing the transmission of heat and sound, and rendering the wall impervious to water. These functions are governed largely by the proportions of the mortar and the method by which it is applied.

The strength and impermeability of the wall depend very largely upon the mortar. Bad mortar allows wet and rain to find a way through the wall, it rapidly crumbles away, and is invariably the chief cause of the rapid deterioration of the building. On the other hand, a good mortar makes a wall drier, stronger, and more durable.

In many districts of England and Wales the by-laws provide for the quality of the mortar which shall be used, and generally these require that all brick and stone work shall be put together with good mortar, or good cement, and that the mortar must be composed of lime and clean sharp sand, without earthy matter, in the proportion of 1 part of lime to 3 parts of sand. Portland cement mortar may be made with good quality Portland cement, in the proportion of 4 parts of sand to 1 part of cement.

In the preparation of ordinary mortar the first consideration is the quality of the lime. Excellent mortar can be made with lime, such as has lime, mixed with sand in the proportion of 1 to 2. The Portland cement should conform to the standard specification of the British Portland cement manufacturers. It is best to purchase the lime from a reliable builder's merchant, and to specify a hydraulic lime, such as, for example, blue has.

Slaking the Lime

Lime has to be slaked, by adding water to quicklime. One way is to excavate a cavity in the ground, line it with rough boards, put the rough, or lump, lime into the hole, cover it with water, and leave it for about a month, at the end of which time the lime will be in a soft, creamy like state, and should be entirely free from lumps of any kind. The lime should be kept covered while it is slaking, to prevent the dust and dirt getting into it, but the covering should be supported on rough bricks or posts, so that air can have free access to the surface of the lime.

If the lime is not properly slaked, it will continue to work and expand, with the result that the mortar joints will be cracked, or, in bad cases, the brick work itself may be displaced. Another method sometimes used, especially for small, quick jobs, is to mix the lime and sand together in the proportion of 2 parts of sand to 1 of lime, and sprinkle them with water from a watering-can having a rose head, applying as much water as the material can absorb, repeating the process from time to time during the day, continuing until the lime is thoroughly slaked. In any case, the lime should be left as long as possible to temper.

When Portland cement is used for making mortar, the mixture should be knocked up, or prepared, immediately prior to its application, as cement mortar sets hard very quickly, and must be used immediately it has been prepared; otherwise it will become set. After that stage has been reached, if it is again knocked up, and more water is added to make the mixture workable, it will seriously diminish its strength. Lime hardens by exposure to the air, whereas Portland cement hardens by the presence of water. For this reason, lime mortar should only be used in dry situations, and cement always where dampness has to be resisted.

When applying the mortar, the bricks should be dipped in water or otherwise wetted, as if they are used dry, they will absorb moisture too quickly for the mortar, with the result that it will crack or may possibly crumble.

Lime mortar works with a fat or greasy feeling, whereas cement mortar is very harsh, and far more difficult to use, for which reason a common practice is to make up a mortar composed of 1 part cement, 1 part of lime, and 2 or 3 parts sand. This mixture works much better, and for many purposes is quite satisfactory. Mortar is applied with a trowel or

float, according to the nature of the work. In bricklaying, it is most important that the vertical joints between the various brick courses be thoroughly filled up, or flushed up, as it is termed, with mortar. Walls are covered with mortar, the process being known as rendering (q.v.). Various modifications of the constituents of mortar are used for such specific purposes as plastering the interior of a room, or plastering on lathing.

Mortar Board. Boards that are fastened together with battens to make a table or platform about 3 ft. square are used to support a quantity of mortar, and should be placed adjacent to the spot where the work is being done. Almost any strong, fairly smooth boards will do, the only requirement being a level and solid surface. The boards should not be badly split, nor should they have holes through them; otherwise a large quantity of mortar will find its way through and be wasted. See Brick; Cement; Plaster.

MORTGAGE. A mortgage is a sum of money borrowed on the security of buildings and land. The person who lends the money has control of the property, which is conveyed to him by legal documents. He is called the mortgagee; the person who borrows the money is the mortgagor.

Many houses are built with borrowed money, and building societies, banks, insurance companies, and private individuals, usually through their solicitors, lend money in this way. They will lend usually up to two-thirds of the value of the house or land. In some cases 90% may be lent. The interest charged depends upon the state of the money market, and is usually paid every six months. The mortgagor can withdraw his money on giving notice (usually three months) except where the sum lent is repayable by instalments.

If the money is not repaid, or if the interest is in arrears, the mortgagee can either sell the property or foreclose. In the former case he must hand over to the owner of the property any balance that remains after the mortgage, interest and expenses have been met. Foreclosing means that the mortgagee becomes the owner of the property. To do this he must obtain an order from a court of law that unless the borrower pays up within a fixed time he shall lose his equity of redemption, i.e. the right to repay the mortgage. If the mortgagee sells the property and does not realize sufficient to pay the principal, interest, and costs, he can sue the borrower for any balance. Sometimes second mortgages are created, but these rank, both as regards capital and interest, after first mortgages.

Stamp Duties. The stamp duties payable when mortgages are created are at the rate of 5s. for every £100. Under £100 they are 6d. for £10, 1/4 for £25, and 2/6 for £50. Persons who lend money on mortgage should see that the mortgaged property is fully insured by the borrower. Those who borrow should see that the interest is paid promptly, while it is to the advantage of both to keep the property in good condition, although the mortgagee has no liability in this direction. Borrowers are well advised if they provide for the gradual repayment of the money borrowed. Building societies usually stipulate that this shall be done, and arrange for mortgages to be repaid by instalments extending over a fixed period of years. In such cases a payment weekly, monthly or quarterly, as the case may be, includes both the interest and a sum towards the repayment of the debt.

The Rent Restriction Acts gives sound protection against the mortgage being called in or rate of interest increased. During the 1939-45 war it was made necessary for mortgagors to obtain leave of the Court before exercising their rights. See Building; Building Society; House; Rent.

MORTISE AND TENON JOINTS

Methods of Making and Their Use in Amateur Carpentry

For fuller information our readers are advised to turn to the wood-working articles, especially Amateur Carpentry: Chisel; Dowelling; Joint; Lock; Tenon; and to those on the various pieces for which mortises are necessary, e.g. Cabinet; Cupboard; Door; Dresser

In woodwork and building construction a mortise is a rectangular hole formed to receive a peg, or tenon, shaped on the part to be jointed. Of its varieties the simplest consists of a mortise, or slot, cut in the centre of a beam, to receive the tenon on the end of an upright, as shown in Fig. 1.

The bare-faced tenon in Fig. 2 has only one shoulder, the other side being flush with the face of the post. It is used when one side of a rail has to be flush with the stile, or post, while the other side is set back from the face. The tenon may or may not pass through the post where the mortise is cut. In the

parts of the framework separated, thus tightening up the canvas.

When the tenon does not pass right through the mortise it is known as a stub tenon. The oblique mortise and tenon in Fig. 6 is used for joints on the ends of braces and struts, and apart from the fact that the shoulders and end of the tenon and two sides of the mortise have to be cut at an angle instead of square, they follow the same principle as the ordinary mortise.

The mortises for a corner post have to be cut with all faces at right angles to each other, consequently the two mortises will have to meet in the centre of the material. They are therefore generally haunched and the rail is mitre tenoned, as in Fig. 7. A double mortise (Fig. 8) is often used in jointing a broad rail into a stile or post.

A good method of making a rigid mortise and tenon joint is known as the fox wedge tenon (Fig. 9). The mortise does not go right through the wood, but terminates at a distance from the face, and the walls of the mortise are cut to an angle, so that the bottom of the mortise in the wood is wider than the mouth, or entrance. The tenon is cut to a width that will

just enter the mortise. Two or more wedges are then made of hardwood and inserted in saw cuts made in the end of the tenon. When the joint is to be finally assembled the parts are glued, the wedges just inserted into the slots, and the joint driven home with a mallet, or clamped up tightly, with the result that virtually an internal dovetail joint is formed which possesses very great strength. A similar system of wedging is often adopted where the tenon passes right through the mortise. In this case the wedges are driven in from the outside and serve to make a perfectly rigid joint. Wedges of this class are always used when the end of the tenon is accessible.

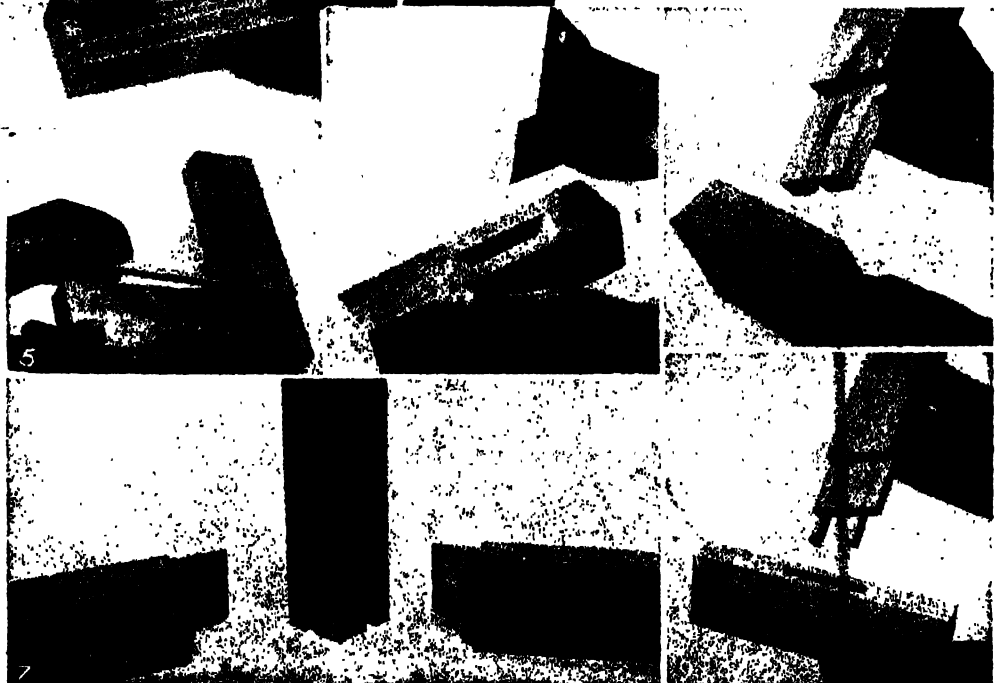
General Principles. Usually, mortise and tenon joints are secured by gluing and wedging, by pins or by draw boring. The proportion of the mortise and tenon in the case of a stub and through mortise should be about one-third the thickness of the material. It is imperative that the walls of the mortise be square to each other and to the joint faces. Similarly, the tenon must be square on all its sides, the two shoulders in line, square with the joint faces.

The general procedure in the making of any mortised joint consists firstly in marking accurately on the wood. This should be done with a scribe and set-square, and the lines should be squared right around the material, marking first the length of the mortise. The width is set out with the aid of a mortise gauge (Fig. 12), which is used to scribe lines on both sides of the part to be mortised. There is thus a rectangular space marked out on opposite sides of the wood, indicating the material to be removed. The tenon should similarly be marked out, with the same setting of the mortise gauge.

The mortise is then cut by drilling holes in the material with a centre-bit, keeping just within the lines. This removes the bulk of the timber and the remainder is cut out with a chisel, preferably a pattern known as a mortise chisel, which has a very strong handle and is used with a mallet (Fig. 10). It is driven down into the wood as far as possible, withdrawn, and the chips removed from the hole; further chiselling continues until the bulk of the hole has been cut half-way through. The timber is

closed mortise the tenon is surrounded by wood on all four sides and the end, and the mortise does not pass right through the wood, but terminates at a distance from the face. When the work is completely finished, the joint between the rail and post is not visible, except as a line of demarcation between the two parts. It is therefore often used in cabinet work, and is also used for the better class of door frame.

The joint shown in Fig. 3 is a haunched mortise; the tenon is cut back for the bulk of its length, but a small projecting portion is left at the side to provide a maximum grip on the post. The slot mortise in Fig. 4 is merely a slot cut in the end of one part to receive the tenon formed on the other part. The adjustable slot mortise and tenon in Fig. 5 are only used where it is desired to exert pressure upon some projecting part of the framework, as, for example, the canvas of an oil painting. The wedges are driven in, and the



Mortise. Showing examples of the leading types of mortise joints. Fig. 1. Plain mortise and tenon joint. Fig. 2. Simple mortise and bare-faced tenon. Fig. 3. Haunched single mortise and tenon. Fig. 4. Slot mortise and tenon. Fig. 5. Adjustable slot mortise and tenon, as used on stretcher of an artist's canvas. Fig. 6. Oblique mortise and tenon. Fig. 7. Double haunched mortise and tenon. Fig. 8. Double mortise and tenon joint for use in table legs, etc. Fig. 9. Double haunched mortise and tenon. Fig. 10. Wedges for securing tenon into mortise.

then turned over and similarly out from the opposite side.

The final fitting may be completed with an ordinary firmer chisel by careful paring. As a guide to the eye, an ordinary set-square should be set by the side of the work, this being an aid to keeping the chisel correctly upright while cutting out the mortise. The tenon may be cut out almost entirely with the aid of a hand or tenon saw, as shown in Fig. 11, by carefully sawing down the



lines. The saw cuts should be kept to the outside of the lines, so that a small amount of material has to be chiselled away to make a perfect fit. The two parts should be tried together from time

to time, and carefully fitted by cutting away all the high places, whose presence is determined by the shining portions of the wood, caused by the friction of one part upon the other. The tenon should be tested with a square to see if the tenon or the mortise is at fault, and any irregularities corrected accordingly. If the joint is to be wedged, a space must be left into which the wedges can be driven.

The mortise chisel is sharpened in a similar way to an ordinary chisel, but the angle is steeper, and the cutting edge rounded. When using the gauge, it is customary to set the pins to the breadth of the mortise chisel nearest to the size of mortise desired. One of the marking pins is attached to the slider that works on the stem, and is adjusted by a screw at the bottom of it. The other of the two pins is attached rigidly to the stem. The head slides on the stem, and consequently two separate adjustments are available; first, by adjusting the two marking pins to the required width and secondly by sliding the head to such a position on the stem that it will mark a mortise at the correct distance from the marking face.

MORTISE LOCK. A special type of lock, known as a mortise lock, is so made and fitted into its case that it can be mortised into the edge of a door, leaving only the bolt and catch protruding, with the turning knobs on either side of the door.

Mortise locks may be obtained in various patterns and shapes, from a very thin-cased pattern, which may be fitted into a narrow

slot in the door stile, to the ordinary type of mortise lock about the same size as a rim lock. Another type is that known as the barrel mortise lock, which may be fitted into a hole bored in the door with a twist bit or auger. Mortise locks are generally of the warded tumbler type, and in the case of some of the smaller varieties, such as the small barrel mortise lock, only one bolt is provided, which is locked by the key, and which also prevents the handle from being turned. Instructions for fitting mortise locks are given in the article Lock (q.v.).

MORTLAKE WARE. The earthenware produced at the Thames-side village of Mortlake, for about 70 years after the middle of the 18th century, was almost as famous in its day as its pictorial tapestry. Any pieces offered as Mortlake should be viewed with the utmost reserve, because there have not been identified enough typical specimens on which to base an assured judgement. There was a factory for common tin-enamelled or delft ware, ranging from large punch-bowls, painted with flowers and medallions, to blue landscape tiles.

Another factory, founded by Joseph Kishner, who marked the ware with his name, turned out a sound, domestic stoneware of the drab or brown type, which was also produced at Fulham. This was sometimes decorated in low-relief with hunting and convivial scenes, but apparently never reached a high standard of artistic merit. It is not unlikely that pieces of Mortlake origin are concealed in museums under more famous names. See Fulham Ware.

MOSAIC: As a Decoration. This attractive process consists of embedding small pieces of stone or other material in cement to form a pattern or design. It is much employed because of its durability, cleanliness and comparative noiselessness to the tread, as well as

for its ornamental effects. The materials employed comprise marble, pottery, and glass.

There are two varieties of mosaic paving, known respectively as the Roman and the Venetian. In the former, a foundation of concrete is prepared and the top of it coated with a thickness of about $\frac{1}{2}$ in. of neat cement. This is floated off to a level surface, and into it are pressed small pieces of marble, of various colours, principally white, red, black, cream, brown and green.

Burnt clay or ceramic mosaic, with blocks $\frac{1}{2}$ to 1 in. square, beside being cheaper and more durable, is available in a wider range of tints. Clay cubes is best adapted for regular geometrical designs, because it does not admit of being trimmed, as marble does, to fit the interstices of a pictorial design. When the mosaic consists of a groundwork of stone of one colour with a simple border in another kind of stone, the border may be set in position first and the remainder of the spaces filled in with self-colour stone.

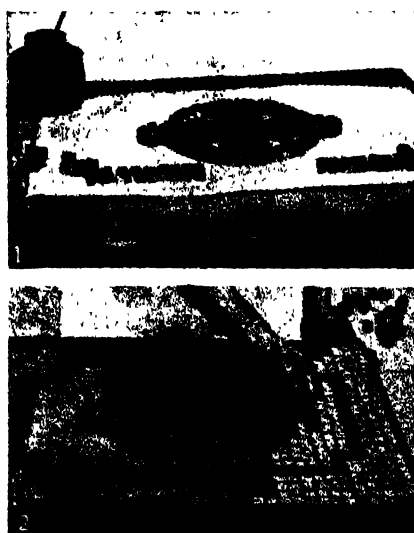
When a pictorial design is wanted the design is first drawn up full size on a large sheet of paper, or several sheets if the area to be covered is of any size. The stones are glued to the paper, placing the face side of the stone against the paper. The concrete foundation should previously have been prepared, and when the design is finished on the paper, a floating coat of neat cement is worked on the concrete. The paper is lifted and turned over on the wet cement and pressed into position. The stones should be pressed into the cement sufficiently to hold them in position, and as soon as the cement has become thoroughly set, the paper is damped and removed from the stones.

The design will appear in outline form on the foundation, and the spaces between the outline of the design are filled in with other pieces of stone bedded in cement, the whole being levelled as much as possible and finished by polishing. The cement joint should form an integral part of the design; when the blocks are fitted so closely to obliterate the joint the result is artistically weak.

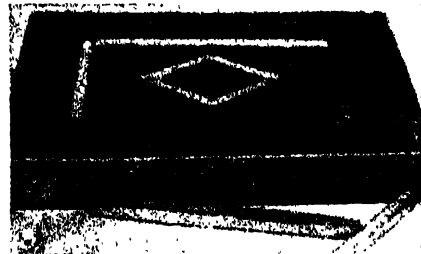
Venetian Mosaic. Venetian or terrazzo mosaic employs marble chips, that are crushed into irregular shapes and sorted out into grades ranging from $\frac{1}{8}$ in. to $\frac{1}{2}$ in. mesh. In this style the cement becomes a filling rather than a joint, and is usually coloured in a contrasting tint. The marble fragments are spread upon the cement, larger pieces being strewn upon them here and there, thickly or sparingly, and the interstices filled with smaller chips. The whole is then levelled by heavy rollers. Sometimes a border is formed in a darker tint, or in marble cube design.

When mosaic tesserae are applied to walls and ceilings they are usually only half as thick as paving cubes. Wall mosaic is most satisfying when carried out in simple and unpretentious designs, with restrained colourings in the borders.

Glass Mosaic. The use of glass mosaic for mural decoration, in emulation of the Byzantine examples, is associated with public rather than domestic buildings. The tesserae, varying from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. square by $\frac{1}{8}$ in. thick,



Mosaic. Fig. 1. Roman mosaic. The pattern has been drawn on paper and the process of sticking the cubes begun. Fig. 2. Design transferred to slab and groundwork being filled in. Fig. 3. Venetian mosaic, showing groundwork laid before rolling; two of the wooden battens have been removed.



are made of opaque glass pastes, and are available in thousands of tints. Glass-and-gold, formed by fusing gold leaf between two layers of transparent glass, is commonly employed as a filling for the pictorial design.

Fig. 1 shows the pattern drawn on the paper and the process of sticking the stones thereon. Fig. 2 illustrates a mosaic design transferred to the slab and some of the stones standing up in readiness for filling in the groundwork. Fig. 3 shows the Venetian system with some of the wood battens in position and others removed to receive the coloured stones for the border design.

MOSAIC: In Potatoes. This disease, which attacks some varieties of the potato more than others, is frequently responsible for light crops in gardens and allotments. It may be recognized by the mottling of the foliage. Coupled with this there is usually a crinkling of the leaves, a waviness in the outline of the leaflets, and other indications that the leaves are not normal. In severe attacks a dwarfing tendency is frequently seen, and with it goes a marked reduction in the yield. The disease is distributed by means of the seed tubers; therefore tubers from infected plants should on no account be put aside for seed. Infected plants should be immediately destroyed, as they never recover from an attack. See Potato.

MOSELLE. The vineyards of the lower Moselle yield very fine white wines of the hock character, dry, delicate, and with an attractive bouquet. The best are Piesporter, Brauneberger, Zeltinger and Berncastler Doktor. Moselle is an excellent beverage drink, going well with most sorts of food. Sparkling Moselle, though apt to be a little over sweet, is a pleasant wholesome wine. The alcoholic strength of the Moselle wines ranges between 17 per cent and 25 per cent of proof spirit. See Hock; Wine.



Moss Rose. Variety of rose so called from a mossy growth on the stems

MOSQUITO. As some kinds of mosquitoes carry the infection of yellow fever and malaria it is important in infected districts to take active measures to destroy the larvae. An efficient method is to pour paraffin oil on all ponds and stagnant pools, using one pint to each 200 sq. ft. of water surface. Cisterns and water barrels should be emptied once a week. Old tins, tubs, and other receptacles for water should not be left lying around the dwelling. Oils of pennyroyal or lavender sometimes keep mosquitoes away if a few drops be sprinkled on the bedclothes, or on exposed parts of the body.

Where the insects abound, mosquito curtains should be used round the bed, and windows that are kept open in the evening should be guarded by fine wire or muslin netting.

Mosquito Bites. Mosquito bites are often very troublesome. As a preventive for

warding off the attacks of these insects the following lotion will be found useful:

Oil of lavender	..	..	20 minims
Oil of eucalyptus	..	..	2 drams
Spirit of camphor	..	..	1 oz.
Soap liniment	..	..	1 oz.

A little of the lotion should be applied to the skin of the hands, wrists, ankles and the neck when the mosquitoes are about. For relieving the irritation the following preparation can be used:

Menthol	..	..	15 gr.
Alcohol (90 per cent)	..	..	1½ oz.
Strong solution of ammonia	..	..	½ oz.

Dissolve the menthol in the alcohol, and then add the ammonia. Dab on to stings and bites as often as required.

MOSS. The popular name moss, which belongs strictly to plants of the Musci family, is applied indiscriminately to many plants. Moss is generally a nuisance on gravel walks. The method of eradication usually practised is to sprinkle the walks well with rock-salt during showery weather. A better way, however, is to brush the surface of the gravel with a strong solution of bluestone, or sulphate of copper. The brushing should be done carefully, and the copper solution kept away from turf edgings or bed or border plants.

Fruit trees are often attacked by various growths which are loosely described as mosses. A precautionary measure is to spray with caustic soda (1 lb. in 10 gallons of water) in winter. When moss is found on lawns it is usually a sign of malnutrition. Rake the surface of the lawn over and give it a dressing of rich sifted soil in springtime.

MOSS CAMPION. A very beautiful plant for the rock garden is *Silene acaulis*, or the moss campion. It is of low moss-like growth and bears rose-pink flowers in spring. It is most likely to bloom well if grown in a moraine. See Moraine Gardening.

MOSS ROSE. The variety of rose known as the moss rose is interesting owing to the mossy growth which surrounds its stems and the bases of its flowers. The principal varieties are as follows: *Blanche Moreau*, white; *Crested Moss, rose*, Little Gem, crimson; *Mme. Morvan, rose*. Moss roses should be grown in rich soil; pruning in March is done by cutting out weak shoots and shortening the others. See Green Fly, Rose.

MOTH. These winged insects, though similar to butterflies in general appearance, are as a rule not so brightly coloured. The body is usually larger and more furry, and most varieties fly principally at night.

Moths in the Garden. The caterpillars of three moths do great damage to fruit trees in the spring. These are the winter moth, the mottled umber, and the march moth, all being sometimes known as winter moths. Practically every form of standard and bush fruit is attacked by these pests. The caterpillars appear early in spring and feed during the entire period in which fruit trees are making their foliage, causing sometimes great havoc.

Winter Moths. Winter moths may be controlled both by grease-banding the trees in autumn, to catch the wingless females as they ascend the trunks, or by spraying the foliage with a tar-oil wash in winter, to kill the larvae. After the blossoms have fallen in spring, spraying with the poisonous lead arsenate, 4-5 lb. in 100 gallons of water, is recommended. See Figure of Eight Moth, Grease, Hornet Moth; Insecticide, etc.

MOTH BALL. The round balls sold as moth balls consist of naphthalene, a product of the distillation of coal tar. Naphthalene is a cheaper substance than camphor for replacing among furs and woollen goods to preserve them from moths. The smell of naphthalene is considered objectionable by many, and on

this account moth bricks are made from a mixture of equal parts of cedar dust, camphor, and naphthalene, made into a brick by mixing with strong soap and water. See Clothes; Clothes Moth; Fur.

MOTHER. The mother of a legitimate child is its guardian after the father. The father is entitled to name a guardian for his children after his death, but the mother is entitled to act with that guardian. A court of law will not allow a man who separates from his wife to take away from her young children. If he does so the court will invariably order them to be returned to their mother, unless she is not a fit and proper person to have the custody of the children.

In the matter of religious education the father is entitled to the deciding word. If, either before or after marriage, a man and woman have agreed that the children, or some of them, shall be brought up in one creed, the father can in law go back on his word and bring them up in another. But if they have begun to be educated in one religion, so that a change would unsettle them, the court will forbid the change.

A mother who has property or means is liable to maintain her children. She is also liable, along with the father, under the various statutes which relate to the care of children. The mother of an illegitimate child is its only parent in law, and the putative father has no control over it. If the mother of a child marries a man, that man becomes responsible for the maintenance of the child until it can maintain itself, just as if it were his own. See Child, Father; Husband, Illegitimacy, etc.

MOTHER-EVE'S PUDDING. To make this pudding, allow 6 oz. breadcrumbs, 5 oz. castor sugar, 6 oz. currants, 6 apples, 3 eggs, a pinch of salt and of nutmeg. Grub the bread very finely, and pare and chop the apples. Clean the currants and stone them. Mix the dry ingredients together and beat the eggs, then beat in the eggs and stir all well together. Butter a pudding basin and put in the mixture. Cover it with greased paper and steam the pudding for 3 hours.

MOTHER-OF-PEARL. The oyster shells from which the chief supply of mother-of-pearl is obtained are found off the coasts of N. Australia and New Guinea, some of this specimens measuring from 6 in. to 9 in. in diameter and weighing several pounds each. The inside surface of the shell is mostly white, but some are of a smoky black colour.

By jewellers and silversmiths mother-of-pearl is very largely employed. It is used for buttons, studs, and cuff links; for the handles of fruit knives and forks and pocket knives. It is cut into round or oval-shaped beads for necklets and rosaries. Cabinet makers use it for inlaying, and large quantities are employed for this purpose in the manufacture of Oriental furniture, especially small decorative tables.

MOTHER OF THOUSANDS. This is the only species of the saxifrages, *S. armentosa*, which is commonly grown under glass. It is useful both for hanging baskets and pots.

The soil should be three parts loam, one part leaf-mould and sand. Propagation is by inserting the plantlets in sandy soil in the propagator in spring or summer. A cool greenhouse suits it well, or it is a valuable adjunct to the indoor rock garden or fernery. The variety *tricolor* likes a warm greenhouse. The time for re-potting is the spring.

Linaria cymbalaria, also known as *pedlar's* basket, is sometimes given this name. It is a creeping outdoor plant suitable for rockeries and old walls.

MOTHER'S HELP. The duties of a mother's help are not very clearly defined, but should be arranged definitely between employer and employee at the time of

engagement. As a rule, the post involves work ranging from that of a nursery governess to that of an ordinary nurse, a certain degree of education being generally expected.

Primarily, the post means care of the children and charge of their wardrobe. The mother's help is expected to be a good needlewoman, able to make simple frocks for her charges, and to do any necessary mending. She may also be expected to do a certain amount of washing, and to be responsible for the general turn-out of the children. If there is also household work to do, it will usually be only of the lighter kinds.

MOTH ORCHID. The hothouse orchid belonging to the genus *Phalaenopsis*, and known as the moth orchid, requires a stove temperature, and should be grown in pans or baskets suspended from the roof of the house. The handsome varieties of *Miltonia vexillaria* are most popular. *See* Orchid.

MOTIF: In Needlework. A motif is a piece of lace or embroidery set into a background of ordinary material to form a trimming. There are crochet and knitted lace motifs in ovals, oblongs, circles, and squares, embroidery motifs of all shapes and sizes, and real lace motifs such as those made with Honiton braid and pillow laces, which take the shapes of flowers, butterflies, etc.

There are several methods of mounting motifs to the material. The first is to tack the motif on the right side of the material, then sew down with a small hemming stitch,

in the case of knitting or crochet, taking one hemming stitch through each stitch of knitting or crochet. The material is then cut away at the back of the motif, leaving about $\frac{1}{4}$ in. to turn back a little hem, or only leaving about $\frac{1}{4}$ in. and buttonholing the raw edge. A second method is to buttonhole the motif to the material on the right side, and cut away the material at the back of it just below the wrong side of the buttonhole stitches.

Another method which gives a strong edge and a neat finish is carried out thus: Lay the motif on the right side of the material and pin it down so that the edges are quite taut and in the correct position. Now draw a pencil line on the material right round the motif, then remove the latter from the material. With embroidery cotton and a fine crewel needle, buttonhole all round the pencilled outline so that the pearl edge of the buttonhole stitch comes right on the pencil line. When the buttonholing is completed, take the motif and sew it, stitch by stitch, to the buttonholing. If the pencilling and sewing are on the correct line, the motif should be an exact fit, and the material at the back can be cut away. *See* Applique; Embroidery; Lace, etc.

MOTOR. This name is commonly applied to any machine which changes some form of energy into mechanical power, e.g. an electric motor, an internal combustion engine, a Diesel engine, etc. *See* Electric Motor; Internal Combustion Engine.

MOTOR CARS: HINTS FOR OWNER-DRIVERS

How to Choose a Car and Maintain it Economically

The important subject of the motor car is dealt with in this article, in one on Motoring, and in a number of subsidiary entries, e.g. Brake, Clutch, Front Axle, Gear, Internal Combustion Engine, Live Axle, Lubrication. *See also* Garage.

The prospective purchaser of a car should carefully consider his requirements before placing an order. There are so many different models from which to choose that choice becomes somewhat difficult to the novice, but he need have no fear about the capabilities of any car now made, whatever its price. The suitability of a car, therefore, is narrowed down to requirements and cost.

For example, it would be unwise to decide on a baby car if the purchaser's family party consisted of four stout persons, for although the car would carry such a load, and the engine have no difficulty in propelling it, the party would not be comfortable.

Neither would it be wise to buy a large car because of its good value if the general running expenses rendered motoring costs a severe drain on the buyer's income.

Taxation of Cars. Motor cars first registered before 1947 are taxed annually on their horse-power rating, but owners of cars first registered in 1947 or later pay a flat-rate tax of £10 a year irrespective of horse-power rating. In 1952 it was proposed to tax all cars on a flat rate of £12 10s. a year whatever the date of first registration.

Horse-power tax is calculated on the Royal Automobile Club formula, which takes into account only the diameter of the cylinders of the engine and not the stroke. The R.A.C. rating is also accepted as a guide when insurance is being considered.

Cars can be divided, roughly, into four different types. 1. Small cars of 750 c.c. to 850 c.c. (7 and 8 h.p.). 2. Light cars between 850 c.c. and 1,300 c.c. (9-12 h.p.). 3. Medium cars up to 2,000 c.c. (13-20 h.p.). 4. Large cars, over 2,000 c.c. (19 h.p. and over).

A large car is very little more difficult to handle than a small one, but usually the novice has more confidence if he begins with

a small car. The fee for a driving licence is 5s., and if it is possible to garage a small car at home, and the owner is able to carry out himself all but major repairs, total overhead charges should be kept within reasonable limits.

Should it be necessary to accommodate the car in an outside garage, the charges vary according to locality, but 10s. a week may be regarded as a fair charge for a small car. In the provinces this charge may be lower, while if the car be kept in a public garage with a number of other cars it may be lower still. Public garage procedure involves a possibility of the car sus-

taining damage through being moved about to facilitate the handling of other cars in the garage. The advantages of a private garage to the owner-driver who looks after the car himself are considerable. It will enable him to give regular attention to lubrication, and to make small adjustments, and thus keep his car in good tune, while reducing to a minimum the risk of breakdown from any minor defect.

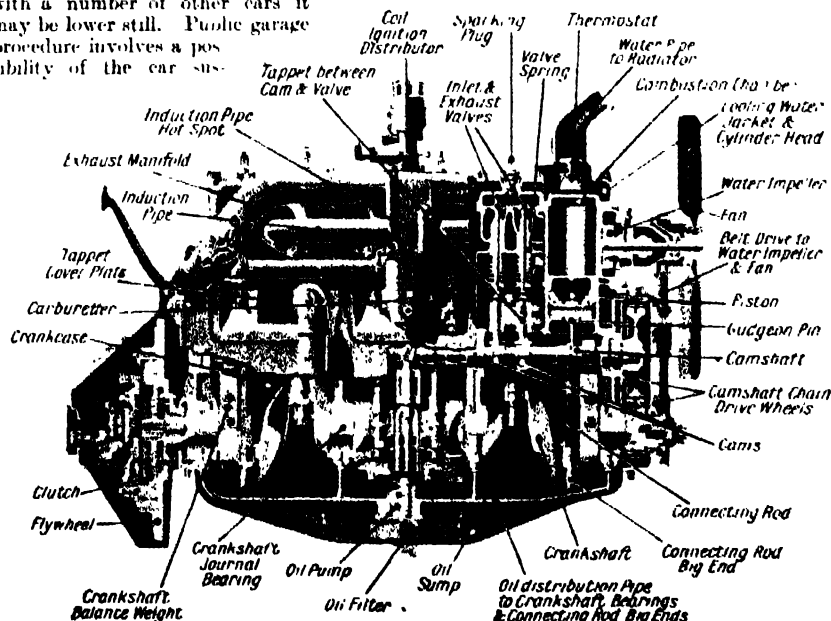
Small Cars. The types of small car available are many, including open two-seater, two-seater coupe, four-seater open tourer, and small four-seater saloon with or without a sunshine sliding roof. Open cars are equipped with hoods and side screens which make them almost equal in comfort to closed types, nevertheless, unless the buyer particularly desires an open car, a closed car is likely to give greater satisfaction, especially one with a sliding roof.

In small cars the space available is somewhat restricted, with the result that in most instances only two doors are provided, access to the rear seats being obtained by folding one of the front seats. Four-door bodies on small cars are not general, but are obtainable on certain chassis.

As a rule the engines fitted to these small cars are of the four-cylinder type and give the vehicle a range of speed from walking pace to about 60 miles an hour.

Three speeds forward and a reverse gear are usually provided, but there are small cars with four speeds forward. The advantages of the extra gear ratio are more apparent with a small car than with the larger types, since the load is relatively greater in the small car. Included also in this class, to a minor extent, is the small six-cylinder vehicle in which a comparatively large engine is fitted in a small chassis, with the result that an exceptionally good performance is obtained, weight being low and power high.

The Light Car. In the popular light car class two door bodies are the exception, and four-door bodies the rule. Costs are considerably higher, so that if four persons are to be the usual load and a low price is an essential factor, the prospective buyer should make his selection with some care and not decide hurriedly. The range of selection in normal times is very extensive, and although this class of car is naturally more expensive than a small car the value is in every way as good.



Motor Car.- Fig. 1. Sectional diagram of six-cylinder engine with principal parts indicated

Brakes and Steering Gear. Police officers or other authorised persons have powers compulsorily to inspect brakes and steering gear.

Dangerous Driving. A person convicted of dangerous driving may be disqualified until he or she has passed the driving test again.

Direction Indicators. It is not necessary for a motor car to have direction indicators, but any fitted to vehicles registered after Jan. 1, 1936, must conform to certain standards.

Driving Licence. No person under 17 is licensed to drive a motor car, and no person under 21 may drive a heavy motor vehicle. A licence to drive a motor car does not authorise the driving of heavy goods vehicles, for which a separate driving test and licence is required. A driving licence for a motor cycle does not authorise driving a motor car or vice versa.

Driving Mirror. All vehicles, except motor cycles, must be fitted with a driving mirror.

Emergency Licences. Persons granted emergency licences without test during the 1939-45 war could apply for their licence to be renewed annually without test, provided they applied before Feb. 1948 and had not had an accident during such time they had held an emergency licence.

Endorsements. A person whose licence has been endorsed for exceeding the speed limit may after a year from the date of endorsement obtain a clean licence if he has had no further endorsements during

that year and if a clean licence was held before endorsement. A licence endorsed on conviction for a more serious offence may be replaced by a clean licence after three years provided no further endorsements have been made during that time.

Horns. No horn or other warning instrument may be sounded while a vehicle is stationary, or between 11.30 p.m. and 7.30 a.m. in a built-up area.

Learner Driver. The holder of a provisional licence may drive a motor vehicle only when he has in the vehicle with him a person who has held a licence for two years or has passed the driving test. This does not apply to solo motor cycles.

Masoot. It is illegal to carry masoots with sharp projections liable to cause injury in a collision.

New Regulations. Vehicles licensed within a year of any new regulations regarding construction and major fittings are usually exempted from complying with such regulations for five years after the regulations come into force.

Noise. There must be no excessive noise from a motor vehicle, due to any defect either in the vehicle itself or in the way it is loaded.

Provisional Licence. A provisional licence, valid for three months and costing 6/-, is issued to persons proposing to take a driving test.

Reverse. Reversing is prohibited on the main streets of London and certain other cities in Britain. Elsewhere, no vehicle may be driven in reverse further than is reasonably necessary.

Service Licences. Licences issued by the Admiralty, War Office, or Air Ministry for the driving of service vehicles are not valid for driving private or commercial motor vehicles.

Servo Brakes. Vehicles fitted with a servo braking system which embodies a vacuum or pressure reservoir are required to have a device to warn the driver of any impending failure in the system.

Tax. By the terms of the 1952 Budget, the horsepower tax of £1 5s. per h.p. was replaced by a flat-rate tax of £12 10s. per car.

Towing. If one motor vehicle tows another, the tow rope must not be more than 15 ft. long and must be made easily distinguishable; as by tying a piece of white cloth or other material prominently on the centre of the rope.

Trade Uses. Motor cars used for trade purposes require a special licence.

Tyres. All vehicles exceeding one ton unladen weight must be fitted with pneumatic tyres.

Unattended Vehicles. Except when stopped in traffic, vehicles must not be left unattended unless the engine is switched off and the hand brake applied.

Width. Maximum legal width for a motor car is 7 ft. 6 in.

Windscreen. Safety glass must be used for the windscreen and all outside windows facing the front.

Windscreen Wiper. Windscreen wipers must be fitted unless the windscreen can be opened to enable the driver to see without looking through it.

Motor Car. Fig. 2. Some important points for the owner

The driving licence remains the same (5s.) irrespective of the type of vehicle. Although the majority of cars in this category are of the four-cylinder type, a number have six-cylinder engines.

Everything else being equal, a six-cylinder engine is much better balanced, and smoother in its operation than the four-cylinder engine, although it is an axiom that a good four is better than a poor six. A car with a six-cylinder engine costs a little more to run, both in fuel and taxation, the extra expense amounting to about 15 per cent.

Medium Size Cars. Next in popularity to the small car, this class contains mostly six-cylinder engines, though there are a number with four-cylinder engines, and eight cylinder power units are included in the specification of a few. The "eight" if of equal quality is slightly superior to a "six," since the turning effort is almost as smooth as that of an electric motor, and gear changing (which some consider hurdlesome) is reduced to a minimum.

The Large Car. Among the large cars are some of the cheapest now on the market. These are of American design, of the mass production type, and are most efficient, although the costs in fuel and insurance are necessarily high compared with the smaller British-designed cars. The horse-power is 20 or more.

Coachwork. There are several different methods of constructing coachwork, including 1, all-steel; 2, metal panelling; 3, fabric-covered; and 4, coach-built.

The all-steel body is constructed of sheet steel pressings, and is only found on cars sold in large quantities, since the tools necessary for their production are very costly and thousands of bodies of one pattern must be

made to make the proposition an economical one. All-steel bodies are immensely strong, and a car may roll right over in an accident with little risk of the body collapsing.

The metal panelled body has a wood frame onto which the steel or aluminium panels are affixed. This system of construction is more costly than the above, but it allows of economical production in smaller quantities.

The fabric covered body is similar to the last dealt with, and at one time where small outputs were concerned was in favour because of its cheapness compared with metal. It lacked robustness, however, and with the advance in metal-body construction the fabric type has become obsolete.

The coach-built system differs only in detail from the methods of the old-fashioned coachbuilders. Every body so made may be regarded as built to measure. For that reason it is very costly, and is only to be found on the highest priced chassis.

Running Costs. It is possible to arrive at a fairly accurate estimate of the probable running costs of a car, though the actual figure will be largely affected by the annual mileage and the general character of the roads over which the car is mainly used. If the vehicle is driven in all weathers, this must be taken into account also.

The expenditure falls under three main heads: depreciation, standing charges, and running expenses. A new car falls in market value directly it is brought into use, and depreciates by about 30 per cent. in its first year, so that this loss in capital value must be reckoned with. In succeeding years the rate of depreciation is less, but the motorist, to be on the safe side, should write off his pur-

chase price over a period of at least six or seven years, as after this lapse of time the car may fetch less than 10 per cent of its original cost, that is, in normal times.

Standing charges, including items like tax, licence, insurance, association subscriptions, and the rent of a garage, are independent of the annual mileage or the use made of the car, and are governed only by time.

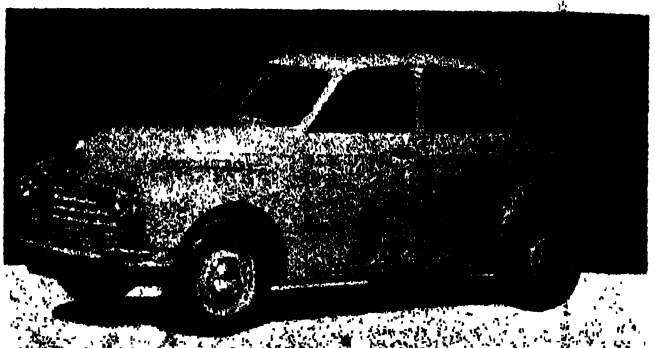
Running expenses include petrol, oil, tyres, and such costs as repairs, maintenance, and the special expenses incurred on the road, i.e. occasional garaging, parking, etc.

Some motorists lay up the car during the winter months. If in any event the car would not be much used during the period, the owner will be able to make a substantial cut in his annual expenses, since the amount of tax and insurance premium payable are lessened, and the running costs cease for the time being. The question of insurance is gone into fully in the subsequent article on motoring.

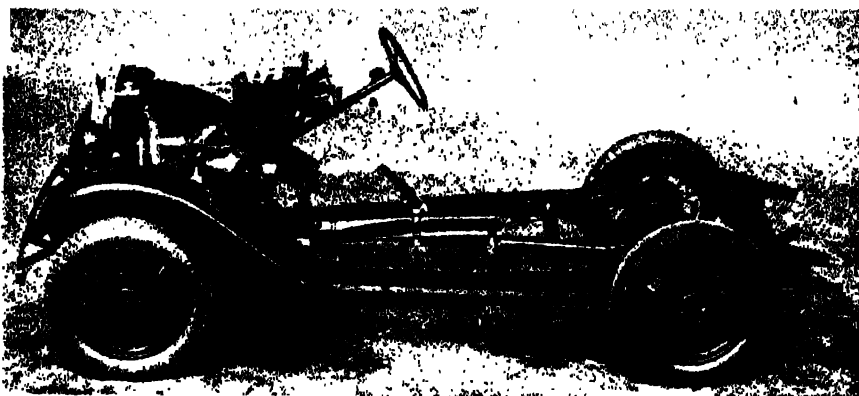
Care of the Car. We now proceed to consider the question of keeping the car in good condition. The information given here should enable the motorist to detect most running and other faults and to apply the necessary remedies before they develop into serious and expensive defects.

By consulting the fault-finding tables, Fig. 8, p. 802, in conjunction with the numbered paragraphs, the motorist may obtain considerable assistance when endeavouring to ascertain the cause of a breakdown.

At a first glance the magnitude of the tables may lead him to suppose that the possible troubles of mechanically driven vehicles are legion; but, in point of fact, it is quite common for a car to remain in very fair



Motor Car. Two post-war British types. Left (Fig. 3), Atlantic convertible open tourer. Rated at 18 h.p., this car established 62 American stock car records at Indianapolis, U.S.A., in 1948. Right (Fig. 4), Morris Oxford saloon. Rated at 15.4 h.p., it has a steering column gear-shift, and a handbrake lever mounted under the instrument panel.



Motor Car. Fig. 5. Morris "Eight" chassis, smallest of the current range. Note the long rear springs, the wide frame, and the position of the battery on the dashboard

order for a whole season without mechanical adjustment.

The procedure by which defects may be traced is simple, as the following example, taken from the first of the tables, will show. Suppose, for instance, that the engine will not start. On inspecting the carburettor it is found to flood properly, and a spark is passing across the points of the sparking plug. Then the reason for the trouble will probably be found in the starter and the causes 1 to 6 in the chart should be studied and considered.

Before passing to the detailed paragraphs it is essential that the term good running order should be properly understood, since the meaning conveyed by it to the ordinary motorist is very different from that placed upon it by the enthusiast. The former is content so long as the car does not actually break down, and loses sight of the fact that some of the faults enumerated may be actually in existence, and may sooner or later cause serious trouble. The enthusiast is never satisfied unless the engine is in perfect tune, developing its full horse-power with a reasonable consumption of petrol and oil, the transmission is working efficiently, and the chassis and bodywork generally are in good order and condition. To ensure this over a long period calls for regular attention.

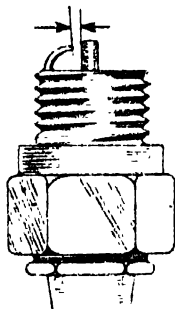
The book of instructions sent out by the maker of the car should be carefully read, as it will amplify the hints given in this article, and will further deal with the special characteristics of the vehicle in question. The following numbered paragraphs are intended to be used in conjunction with the fault-finding tables:

1. If the cause of the engine failing to move is an exhausted battery it is probable that a faint click will be heard as the starter switch is pressed, indicating that the Bendix pinion has moved slightly. If the battery is completely exhausted, however, even this indication will be absent. The quickest test is to switch on the lights.

2. Failure of the starter switch may be checked by connecting the battery voltmeter across the contacts after closing the switch. There will be no voltage reading if the switch is in good order. If it is out of order a reading will be given. If the Startix automatic switch is being used and there is no response when it is switched on, the switch should be turned to "hand" and an attempt made to start the engine by the ordinary process of pressing the starter button.

4 and 5. If, when the starter button is pressed or the Startix turned to "automatic" there is no turning of the engine, two possible faults should be looked for, meshing of the starter pinion and a frozen

water pump. In very cold weather it may happen that the water in the pump will freeze, even though the water in the radiator has been kept from freezing by suitable coverings or heaters. On such an occasion the pressing of the starter switch will simply produce a metallic thud, but will not turn the engine. No second attempt should be made if a frozen pump is suspected until this possibility has been eliminated, because if the engine is turned while there is ice in the pump, the pump vanes will probably be sheared. The small tap situated at the base of the pump should be turned on to see if water flows freely, and even then some further precautions should be taken because, although there may be free water in the pump, there may also be solid pieces of ice.



Motor Car. Fig. 6. Sparking plug, showing how gap between points of plug may be measured

If the failure of the starter to turn the engine is due to the jamming of the starter pinion with the teeth on the flywheel the car should be placed in gear with the switch off, and should then be rocked to and fro. This will sometimes free the pinion. Afterwards the pinion should be cleaned and lubricated.

A good general test when the starter fails to turn the engine is to switch the headlights on, and then to go and stand in front of the car and ask a friend to press the starter button. If the lights are very markedly dimmed the fault may almost certainly be attributed to the battery.

6. Dirt is the most common cause of starter failure. The brushes may be sticking in the holders or the commutator may be dirty. The armature coils may be burnt out, or there may be a short-circuit fault in the field coils.

10. Gummy pistons are most often caused by the use of the wrong kind of oil. In cold weather a change of oil to one of the lighter grades recommended by the manufacturers is a precaution which must be taken if gummed-up pistons are to be avoided.

11, 12 and 13. Petrol Failures. In tracing trouble due to petrol failure, and including failure of the mixture to reach the cylinders, the first step is to ensure that the petrol tap is on and that there is no blockage in the pipe line. Should the vacuum feed (if fitted) be at fault the only cure immediately possible to the driver on the road is a smart blow on the external casing of the apparatus. This

will often free the valves if one of them is stuck. Further attention to the Autovac must consist in seeing that the gauze filter is clean, and that the air vent hole in the main tank filler cap is not choked. All unions and pipes must also be checked for leakage and the petrol pipes must be cleared by blowing through them.

Occasionally in engines fitted with large choke tubes where the suction on the induction system is unusually low, as when driving for long periods at full throttle, the vacuum tank may dry up. This fault can be overcome simply by closing the throttle for a brief period occasionally. A device known as a "vacuum booster" may be fitted to overcome this trouble and admit of long periods at full throttle without failure of the fuel supply, but these devices necessitate resetting of the carburation.

If the air vent at the top of the main tank in the vacuum feed apparatus gets blocked up the tank may collapse as a result of the excessive reduction in pressure brought about by the pumping action of the engine.

14. Petrol pumps of the positive type are now the commonest form of supply system. The pump of the A.C. type is worked off the engine camshaft, a diaphragm forming the pumping element. This type of pump should never be dismantled, because a special tool is needed for reassembling it. Failures are extremely rare, but if one does occur a new pump must be fitted and the old sent for repair.

Faults which can be corrected may be briefly mentioned, although most of them are obvious if the trouble has definitely been traced to the pump. First of all, the glass bowl through which the petrol passes to the pumping chamber may be loose. The cork gasket should be examined to see that it seats properly. A dirty filter gauze may be cleaned by removing the glass bowl and cleaning it. The valve plug on top of the pump may have become loose. It can be tightened with a spanner. If there is a leakage of fuel at the diaphragm the screws on the cover must be tightened alternately. It should be remembered that the pump must not be dismantled.

Electrical fuel pumps are now standard in a large number of cars. They are operated from the battery of the car, and are usually connected up with the ignition switch so that no petrol can be pumped when the switch is off. The system is worked by means of an electro-magnet and a bellows. In the Autopulse pump the connexion should be made to the coil terminal of the ignition switch or to the switch wire terminal of the coil. If the pump operates for a long



Motor Car. Fig. 7. Flooding the carburettor: a preliminary test in checking the fuel feed

ENGINE WILL NOT START	Starter	Engine immovable	1 Battery run down	ENGINE POWER FALLS OFF AFTER RUNNING	Mechanical	64 Bearings becoming hot
			2 Starter switch failure			65 Heavy carbon deposit in cylinders
			3 Starter lead disconnected			66 Water pump faulty
			4 Starter pinion meshing with flywheel			67 No petrol
			5 Water pump frozen			68 Punctured float
	Engine turns slowly	6 Starter motor failure	Petrol	69 Needle binding in guide		
		7 Battery partly run down		70 Choked jet		
		8 Loose terminal in circuit		71 Choked petrol pipe		
		9 Dirty connections		72 Contact breaker arm sticking		
		10 Pistons gummy		73 Broken carbon brush		
Petrol .. No response to turning of engine ..	Ignition	11 Petrol turned off	ENGINE STOPS	Ignition	74 Condenser faulty	
		12 Blockage in pipe			75 Internal shorting due to moisture	
		13 Vacuum feed apparatus failure			76 Dirty contacts	
		14 Petrol pump failure			77 Timing wrong	
		15 Air lock			78 Broken valve	
	Mechanical	16 Jets blocked	79 Stripped timing gears			
		17 Water in carburettor	80 Broken piston, con. rod, etc			
		18 Dirty filter	Clutch	81 Clutch lining burnt		
		19 Carburettor flooding		82 Toggle arms not-adjusted		
		20 Switch off		83 Broken clutch shaft		
Ignition .. No response to turning of engine ..	21 Switch wire shorting	Gear-Box		84 Seized clutch shaft		
	22 Dirty contact breaker			85 Warped disk		
	23 Mal-adjusted contact breaker		86 Clutch lining broken			
	24 Magneto windings burnt out		87 Faces need redressing			
	25 Condenser burnt out		88 Main shaft broken			
	Petrol	26 Plug points too wide	Rear Axle	89 Universal fault		
		27 Battery run down		90 Lay shaft stripped		
		28 Connections loose or broken		91 Broken ball in a bearing		
		29 Low tension winding shorting		92 Insufficient oil		
		30 Coil faulty		93 Gears meshing too deeply or not deeply enough		
Ignition .. Faulty plugs ..		31 Condenser faulty	Noise .. .	94 Wear		
		32 Distributor faulty		95 Damaged crown wheel		
		33 Ballast resistance faulty		96 Broken jack shaft		
		34 Partially choked jet		97 Broken propeller shaft		
		35 Flooding of carburettor		98 Pedal comes against footboard		
	ENGINE MISFIRES	36 Fuel feed faulty	CHASSIS FAULTS	99 Adjustment for wear excessive, so that all travel of cam is used up		
		37 Wrong size choke tube		100 Seized brake camshafts		
		38 Insulation broken down		101 Mal-adjustment		
		39 Plugs too wide or too close		102 Water or lubricating oil in one drum		
		40 Soaked up		103 A camshaft seized		
Mechanical		41 Broken carbon brush on slip ring	Brakes .. .	104 Pull-off springs faulty		
		42 Dirt on slip ring		105 Seized camshafts		
		43 Broken or displaced H.T. lead		106 Operating mechanism binding		
		44 Broken valve		Steering	107 Front tire pressures uneven	
		45 Valve pumped up			108 Truck arm loose	
	46 Broken valve spring	109 Worn joints in track rod				
	47 Vacuum feed	110 Worn steering gear				
	48 Petrol pump	111 Broken bearings in front wheel				
	ENGINE STARTS AND THEN STOPS	Petrol	49 Partial stoppage in petrol pipe	Failure to free	112 Angle of axle pins incorrect through spring set	
			50 Sticking needle valve		113 Worn gear	
51 Carburettor jet loose			One-sided pull		114 Worn bearings in steering box	
52 Water in carburettor					115 Front tire pressures uneven	
53 Choked filter					116 Bent front axle or steering arm	
54 Petrol tank air vent stopped		117 Damaged track rod				
55 Slow running jet blocked		118 Tie in mal-adjusted				
ENGINE RUNS AT WIDE THROTTLE OPENINGS, BUT NOT AT SMALL		Petrol	56 Leak in induction manifold	Wheel wobble	119 Spring faulty	
			57 Slow-running jet-screw mal-adjusted		Excessive play	120 Front tire pressures uneven
			58 Tappets mal-adjusted			121 Front tire pressures uneven
	59 Worn valves and guides		122 Front tire pressures uneven			
	60 Condenser faulty		123 Front tire pressures uneven			
	ENGINE DOES NOT GIVE FULL POWER	Mechanical	61 Valves burnt or deformed	One-sided pull		124 Front tire pressures uneven
			62 Main jet choked		125 Front tire pressures uneven	
			63 Wrong size choke		126 Front tire pressures uneven	
			64 Front tire pressures uneven		127 Front tire pressures uneven	
			65 Front tire pressures uneven		128 Front tire pressures uneven	

Motor Car. Fig. 8. Fault-finding chart which, in conjunction with numbered paragraphs in text, will assist in tracing the cause of a defect or breakdown

period before the engine is started (it can be heard working clearly) after switching on, the indication is that there is a leak on either the suction or the delivery side of the pump. If the leak is on the suction side the pump will work rapidly and air bubbles will be seen in the filter glass. The fittings to the tank should be checked over.

If the pump works exceptionally slowly the leak is probably on the delivery side, and the fittings between pump and carburettor need examining. The valves in this pump are directly under the filter base, and may be reached by removing the cap screw on the top of the pump and lifting off the glass. The two brass screws which are then revealed should then be undone and the valves cleaned. In replacing the valves the one on the tank side must be replaced with the flange uppermost and the other with the flange downwards.

In setting the driving screw which regulates the stroke of the pump, a gap of about 0.04 in. should be left between the bottom of the armature and the top of the magnet. No oil of any kind should be permitted in the Autopulse mechanism.

15, 16, 17 and 18. An air lock in the pipe line may cause a very puzzling form of trouble. The trouble may be manifested only at certain times and may be particularly elusive. Much has been done to eliminate

air locks by running the fuel pipes smoothly and avoiding sharp bends and curves. In addition, the positive petrol pumps have greatly reduced the chances of trouble of this kind. If an air lock should occur the pipe should be taken down and blown through. If the trouble is persistent the pipe should be examined to see if it passes very close to some hot part of the engine, such as the exhaust manifold or exhaust pipe. The heat from the exhaust system has been known to cause vaporization leading to air or vapour locks in the system.

Water in the carburettor may also cause a trouble which is difficult to diagnose. Intermittent missing and irregular running with occasional popping in the exhaust are the usual symptoms. The engine will suddenly lose power and spit, and then as suddenly regain its power. A very dirty filter will cause a more constant form of faulty running, such as a falling-off in power, difficult starting and perhaps over-heating.

19. Flooding of the carburettor may be caused by a dirty or sticking needle valve or by a punctured float. The adjustment of the counterweights which determine the movement of the needle valve may be incorrect. Or their pins and holes may be corroded through the use of unsuitable petrol. The pins may be bent. A leaking float can be detected by taking the float

out and waving it about, when the petrol inside will be heard splashing about. The petrol should be removed by first placing the float under very hot water and watching for bubbles. These will indicate the position of the puncture. The float should then be turned down until the point from which the bubbles are coming is at the bottom, and held thus until all the petrol has been driven out by the heat of the surrounding hot water. When the float is cold again soldering may be attempted, although it is not advisable, because it is an exceedingly difficult task to solder a float satisfactorily. A new float is the best cure of the trouble.

20, 21, 22, 23 and 24. Ignition Troubles. When a fault has definitely been traced to the ignition and it is found that there is no spark at the plugs, the preliminary precautions are to see that the switch is on and that there is no shorting in the switch wire. The simplest method to ensure this is temporarily to detach the switch wire altogether. The contact breaker points will then be examined and the gap checked. In a magneto the rocker arm should be examined to see that it is not sticking. If it is found to be sticking it must be removed and the bearing eased very carefully.

Difficulty in starting when a magneto is fitted may often be traced to a partially burnt-out armature winding. It is a difficult

trouble to run to earth, and the best system is the replacement of the magneto by another one for trial purposes.

25. A faulty capacitor is usually indicated by signs of burning at the platinum make and-break points. The condition of the capacitor can be checked by applying test leads to the end plates of the capacitor for a second or so. On discharge the capacitor should give a sharp crackling spark. If the capacitor is definitely at fault it must be replaced, for repairs are not practicable except with special equipment. Sometimes magneto magnets lose their magnetism, but this fault is much rarer than is generally supposed.

A good test of the magneto primary winding is made with a piece of thin paper inserted between the contact breaker points. The armature is turned slowly with the paper between the points and then without it. Without it there should be a strong pull; but with the paper between the points there should be scarcely any pull at all. A defective primary winding will be indicated if a weak pull is obtained under both conditions.

26. Plug points have to be in exceedingly bad adjustment if they are to cause real trouble in starting if the rest of the electrical equipment is in perfect order. But if the magneto is weak the smallest maladjustment of the plug points will prevent the engine from starting. A spark plug which fires when tested by laying it on the cylinder block may fail when it is under pressure within the cylinder. Leaky insulation is sometimes extremely difficult to detect. A slight crack in the porcelain may ruin the plug, but be scarcely noticeable by eye. The best way to check plugs is to introduce a complete new set. If after that the engine runs well and the fault is cured, then a plug fault is certain and steps may be taken to try to ascertain which of the old set of plugs is causing the trouble. (See Fig. 6).

27, 28, 29, 30, 31, 32 and 33. In coil ignition the main principles of tracing and curing faults remain the same as for magneto ignition, but faults are more readily tracked down with coil ignition. A coil may be checked by removing the high-tension lead and screwing on in its place a piece of copper wire. This should then be bent over so that its end comes within about a quarter of an inch of the base of the coil so as to form a test spark gap. One of the primary leads from the battery to the coil is then quickly touched on to its terminal. If a long silent spark occurs at the test gap the coil may be assumed to be in good condition. If the spark makes a loud crackling sound the indication is that the primary winding is shorting. Erratic running of the engine indicates faulty adjustment of the contact

breaker points. These should be set with scrupulous accuracy (Figs. 9-11).

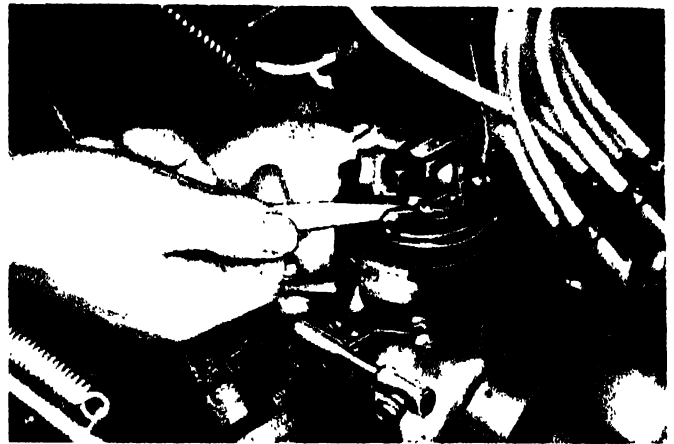
The distributor with its brush should be inspected for any defect, and a broken circuit is checked by turning the engine until the contact points close, and noting if the ammeter shows the usual reading.

If there is no reading the low-tension cables and connexions should be traced by starting at the battery and following through to coil and contact breaker and then back to the battery or earth. Low-tension connexions have much to do with the satisfactory working of a coil ignition system. All terminals must be clean and bright.

A ballast resistance is included in the primary circuit to prevent damage to the primary circuit winding at low speeds. The resistance prevents excessive current going through the primary circuit. If the ignition is left switched on for a long period the ballast resistance will take up some of the current and help to safeguard the windings, but it may not succeed in doing so entirely, and a damaged ignition coil is likely to result if the ignition switch is left on for a very long period.

Misfiring. The faults indicated by the numbers from 34 to 43 have either already been dealt with or else have self-evident cures. Numbers 44, 45 and 46 are mechanical faults and their cures are also self-evident. One cause of a sticking valve, however, is not so obvious, and that occurs when the valve-stem gets dry and tends to bind in its guide. A rough and ready cure for this form of binding which sometimes cures the trouble completely is to mix with the petrol a small quantity of lubricating oil. Special oils are sold expressly for this purpose, it being contended by their maker that the valves run more freely and the upper part of the cylinders gets better lubrication when there is a small admixture of oil in the petrol. However that may be, it is certain that the cure for a sticking valve is sometimes effected by adding oil to the petrol.

55, 56, 57, 58, 59, 60 and 61. When the engine refuses to idle, blockage of the slow



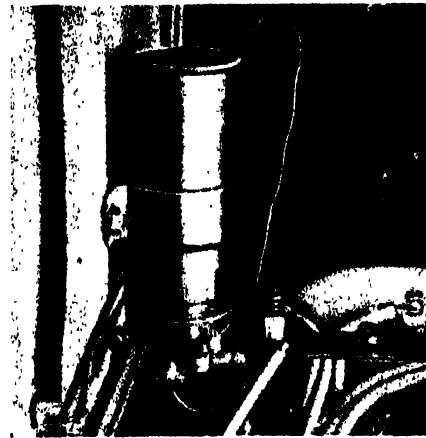
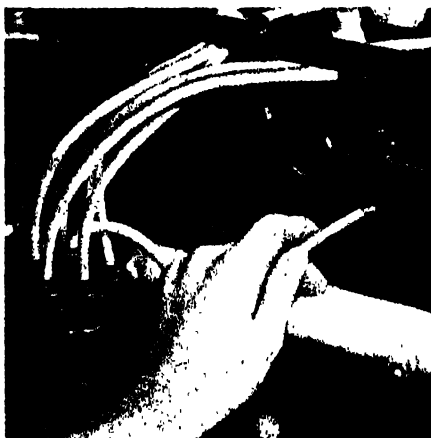
Motor Car. Fig. 9. Correct setting of gap in contact breaker is of great importance with coil ignition. A feeler gauge is essential.

running jet may be the cause. Correction of this fault entails the partial dismantling of the carburettor to extract the jet for examination; any foreign matter should then be ejected by forcing it out of the jet orifice with air. Another common cause of poor slow running is the presence of air leaks.

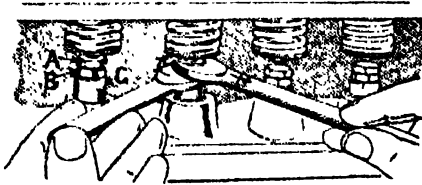
There are numerous classes of air leakage into the induction system which may upset the carburation. Wear may occur between the valve stems and guides, in which case new guides should be fitted. Air leakage may also occur through wear at the throttle bearings. The remedy in this case is to rebush or pack the bearings. All joints of the induction system should be overhauled and bolted up tight. Another source of leakage may be the connexion to the suction-operated windscreen wiper, which if faulty or broken, may quite upset the slow running and starting.

Other reasons for poor idling are maladjustment of the throttle stop or sticking of the accelerator control. In the former case the screw on the throttle arm should be turned so that the butterfly valve is set more closely; if the accelerator is jamming attention should be turned to the ball joints on the rods, the pedal anchorage and the return spring.

Excessive clearance between the valves and tappets will cause an engine to cease running below a certain speed, and when checking over for this fault particular attention should be given to all the tappets, a feeler gauge being used (as in Fig. 14). Where any engine has been in service for a long time pitted and burnt valves may be suspected as the probable cause of poor slow running.



Motor Car. Three important points in keeping a car free from faults. Fig. 10 (left): holding a high-tension lead near the cylinder block in checking ignition system. Fig. 11 (centre): checking for coil breakdown with a "test gap." Fig. 12 (right): all terminals should be kept clean and bright.



Motor Car. Fig. 13. Tappet or valve clearance is measured by a feeler gauge inserted between end of valve stem and head of screw A, which is screwed into or out of tappet C to adjust clearance, and is locked in position by lock-nut B.

When an engine loses power the trouble will probably be due to the fault indicated by the number 62, and clearance of the main or running jet will immediately effect a cure. On the other hand, progressive loss of power suggests that the engine is heavily carboned up, and removal of the cylinder head, the grinding of the valves and a thorough removal of carbon deposit from the combustion chambers, ports and pistons will be called for. Excessive carbon deposit is most frequently caused by badly worn pistons and cylinders and also by worn piston rings or worn grooves. Through excessive clearance at these points oil is sucked up during the induction stroke and deposited in the combustion chamber and on the piston, and is burnt by the heat generated during the power stroke, thus forming, together with road dust, a hard deposit.

This deposit is liable to become incandescent and ignite the fresh mixture before the end of the compression stroke. When this happens it will be seen that instead of the piston rising on compression, it will be rising against the very high pressure of the prematurely exploded charge. This fault is commonly known as pre-ignition, and can only be cured by a renewal of the worn parts responsible, or by frequently removing the cylinders or cylinder heads and carefully scraping away all signs of carbon deposit. Pre-ignition causes knocking, and reduces the power which can be developed.

Poor compression may be due to various causes; for instance, the pistons and cylinders may be badly worn. Other causes include: a broken piston ring; piston ring slots in line; piston rings loose in their grooves; and a scored cylinder wall, due to the gudgeon pin working out at one end of the piston. Defective pistons or piston rings must be replaced. If the valves are properly ground in, they will not give any trouble for some considerable time.

The joint between detachable head and cylinder casing should be examined, as the gasket may be defective, or the holding-down bolts not tightened up uniformly. If the cylinders are worn oval or scored, regrinding and filling of the scores will be necessary. Thin, hard steel liners may be forced in after the cylinders have been suitably enlarged in which case it may be possible to utilize the old pistons. A gasket which is defective in any way should not be used. It is advisable always to keep a spare gasket in hand.

A weak valve spring should be replaced by a new one since it will not return the valve to its seating quickly enough when the engine is running at high speeds. It is futile to attempt to stretch it. The only remedy for broken valve springs is a replacement. When a valve is fitted the seating should be re-cut, as the original face angle will probably have been altered during regrinding. The stem of the valve must move freely, but must not be loose in the guide, and it should be the same length as the old one.

An elusive cause of loss of compression is a stretched valve stem or too little tappet clearance preventing the valve from seating properly when the engine is hot. The engine should be turned until the cam is clear of the

tappet, the valve then being seated, and the tappet should be adjusted to give the clearance specified by the makers of the engine. This varies considerably, but for most side valve engines a tappet clearance of .004 in. is suitable for the inlet valve and .005 in. for the exhaust valve. For overhead valve engines the clearance is slightly greater. A feeler gauge should be used, and the adjustments should be made when the engine is warm. It is safer to have too much than too little clearance.

If the silencer is allowed to become choked with soot the exhaust gases will not be able to escape quickly enough to allow the engine to develop its proper power when running at high speeds. This trouble may never arise if the silencer is of sufficient size and of good design and if carburation is satisfactory.

The air supply to the carburettor must be properly proportioned to the amount of petrol supplied if even running and full power with economy of petrol consumption are to be obtained. Carburettors vary so greatly in construction that it is impossible to give any rules for the adjustment of air and petrol which would be generally applicable. It may be stated, however, as a general rule, in the case of an over-rich mixture, that it is safer to increase the size of the choke than to decrease the size of the jet, while for a weak mixture it is better to increase the size of the jet.

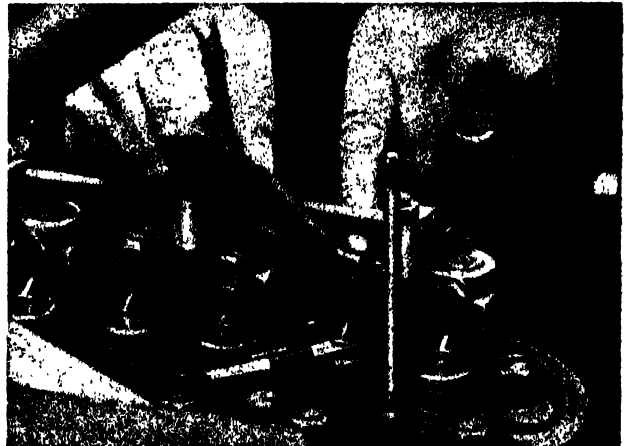
To obtain maximum power at high speed it is advisable to keep the diameter of the choke tube as large as possible, thereby avoiding throttling of the gases. The carburettor should always be kept correctly adjusted for slow running, such adjustment being made when the engine is hot. Instructions for tuning can usually be obtained from the makers.

Overheating of the engine is due to

failure of lubrication, shortage of cooling water, choked water pipes or cooling elements, a worn water circulating pump, a slack belt driving the fan or water pump, a choked silencer, imperfect carburation or ignition too far retarded.

The oil level in the sump should never be allowed to get low; it is best to replenish it frequently and keep the sump full. If the oil is dirty or contains sludge it must be drained off, the sump flushed out with flushing oil, and refilled; this should, in fact, be done about every 1,500-2,000 miles or according to maker's instructions.

If any of the oil pipes or passages have become choked they must be cleaned even though the engine may have to be partly



Motor Car. Fig. 14. Method of adjusting valve clearances with a feeler gauge. Tappets of an overhead valve system are being adjusted.

dismantled. Pumps, whether of the gear wheel, plunger, or rotating vane type, must be replaced or repaired if they do not force oil through properly.

The radiator should always be filled, and replenished with rain or other soft water, thus avoiding any deposit of lime in the system, which would result from the use of hard water; such deposit, unless very hard, can be removed by running the engine for a short time with a strong solution of common soda and water in the cooling system. After this mixture is drained off the system must be well washed out before it is refilled with soft water.

An imperfect mixture results from the carburettor not being properly adjusted, or not of a suitable size for the engine to which it is fitted. Until this is corrected unsatisfactory running at varying engine speeds will be certain to occur.

Since water is heavier than petrol and the two do not mix, the water remains at the bottom of the tank or in the float chamber of the carburettor. With a properly designed tank, water can be present in some quantity without any getting through into the carburettor, since the outlet pipe usually projects slightly above the bottom of the tank. If, however, only a little water passes into the float chamber it may get into the jet orifice and cause irregular running. If sufficient water passes through it will entirely stop the flow of petrol, thereby making it impossible to keep the engine running at all. The tank and the float chamber must be drained completely and thoroughly cleansed.

For protection against water in the carburettor a precaution is to use a chamolite leather filter when refilling the tank. With petrol station pumps this precaution is hardly necessary, as the pumps incorporate a filter which will normally be found satisfactory; but if at some wayside garage it becomes necessary to fill the tank from a can the chamolite leather filter is of value.



Motor Car. Fig. 15. Facing knocks in power unit with screwdriver. The sounds are thus amplified and their source is easily located.

The usual causes of clutch slip are faulty adjustment, insufficient spring pressure or the presence of oil on the friction faces, but the different types of clutch vary greatly. A weak spring or springs where no adjustment is provided should be replaced by new, and this should be obtained from the makers to ensure correct strength. With clutches working in oil, slipping may be due to worn plates, worn or missing cork inserts, or weak springs; or a thorough cleansing and fresh lubricant may be necessary. A little oil on a dry plate clutch is soon burnt off, but continued leakage from the engine into the clutch pit may account for persistent slipping.

Some clutches have an adjustable stop by which the position of the clutch pedal can be determined, so that it is advisable first to make sure that this stop is not preventing the clutch from entering into full engagement. The clutch cannot engage properly if the pedal arm is forced hard up against the under side of the floor board. It should be half an inch clear when the clutch is engaged. Unnecessary wear of the ball thrust bearing will also result from this defect. A slipping clutch, if allowed to cool, and provided the engine is not speeded up unduly, will often hold for a short period, thus enabling the motorist to reach a garage or his home if only a short distance has to be travelled. The troubles enumerated under 81, 83 and 84, however, rule out any possibility of proceeding without the car being towed. All the defects indicated by the numbers 85 to 92 demand immediate attention.

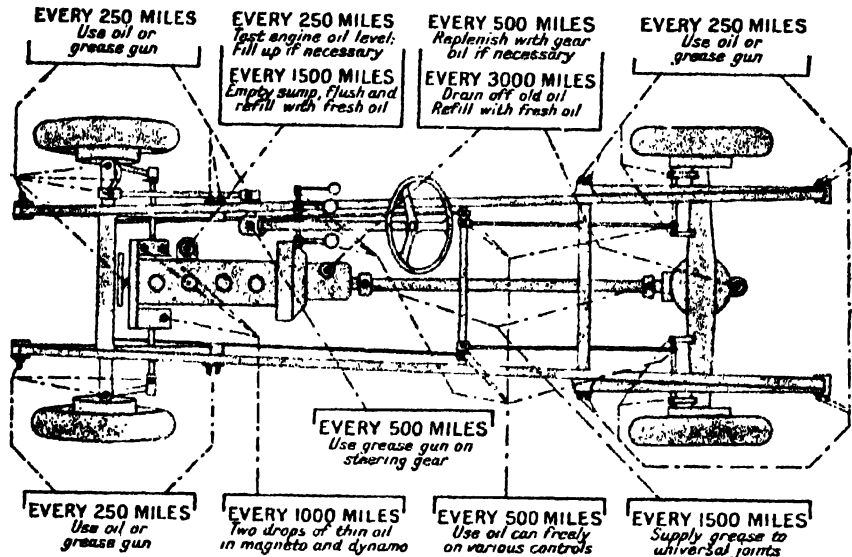
98, 99, 100, 102, 103, 104, 105 and 106. The defects indicated under these numbers are due to neglect and, with the exception of those caused by wear of the friction linings, are easily remedied by cleaning, oiling and adjustment.

Defects in the steering of a vehicle may arise from any one or more of the causes given under the numbers 107 to 119. Soft tires or tires inflated to different pressures will make the steering stiff and cause a bias or drag towards one side.

Assuming the tires are properly inflated, a persistent drag to one side may be the result of excessive wear in one of the steering head bearings, thus preventing the tire of the road wheel concerned from making contact with the road at the proper point, and upsetting any centre-point steering features which the vehicle may possess. An excessive amount of free play will be due to wear of the worm or other steering mechanism and possibly the joints of the steering transmission. In most cases adjustment is possible. In worm gearing the worm can often be turned to a new position. Should the steering become stiff, attention should be given to lubrication, particularly of the steering heads and the worm, screw, or other operating mechanism.

Lack of proper attention to the lubrication of such parts as the spring shackle pins, the brake control joints, and the leaves of the springs, is a frequent cause of intermittent squeaks and rattles while the car is travelling. Other causes may be loose mudguard stays, slack holding down bolts for the running boards, worn windscreen fittings, perished felt, leather, rubber or other seating strips on which the edges of the bonnet rest.

Binding of the brakes or slipping of the clutch may be responsible for poor acceleration. The hand brake may have been left on. Want of lubrication, apart from increasing the difficulty of applying the brakes, may cause them to remain in engagement after the hand lever or pedal has been released. One or more of the holding-off springs may have broken, leaving the brake shoes in contact with the drum. If the shoes are set too close to the drums the flexing of the springs may cause intermittent contact between shoes and drums.



Motor Car. Fig. 16. Typical chassis lubrication calendar, giving a general indication as to how often the different points should be lubricated if satisfactory performance and long life are to be secured. If the mileage is small the car should receive some attention every week.

If the brakes are not used for any part of a run the drums should be cool to the touch. If they are not or even warm there is some continuous or intermittent binding. One way of testing brake adjustment is by feeling whether the drums have heated uniformly at the end of a run when they have had normal use. The operating connections on an overheated drum should be slackened off, or vice versa.

A fierce clutch which grips suddenly and starts the car with a jerk may cause serious damage to the transmission, and may even twist and ultimately break the axle driving shafts. A possible but not very likely cause is want of alignment, due to wear of the central spigot bearing between rear end of crankshaft and forward end of clutch shaft.

The various types of clutch differ so much from one another that it is difficult to give any generally applicable rules, but mention may be made particularly of the following: In the widely used single-plate clutch in which friction disks made of asbestos fabric reinforced with brass wire are interposed between the metal driving and driven disks, fierceness can be cured by injecting a little thin oil into the clutch. Very little is sufficient to soften the asbestos surfaces slightly, although any excess is soon burnt off.

Clutches employing cork inserts engaging metal plates always run in oil, and fierceness may be due to the oil being too thin or the clutch requiring cleansing or renewal of the oil.

Breakdowns on the Road. Should the engine fail to run or to start, the trouble is probably some comparatively minor derangement of the ignition or the carburation. In the event of a breakdown on the road the cause should be investigated as follows: First make sure that the petrol is turned on and is available at the carburettor jets. Then find out whether there is a spark at the plugs by removing one of the high tension leads from a plug terminal and holding it so that the terminal on the wire is close to but not touching some metal part of the engine. Then get an assistant to turn the engine by the starting handle and watch for a spark to jump across the intervening gap.

Should the spark be present, the question as to whether the gap between the points of the sparking plug is correct should next be investigated and the procedure outlined in the various headings above may then be followed; it is probable that the trouble will be located long before a more serious breakdown need be contemplated.

MOTOR CYCLES: BUYING AND RUNNING THEM

Facts and Figures as Aids to Economy and Efficiency

The information given in this article is supplemented by that in the entries on the various parts of the machine, e.g. Brake; Carburettor. See also Garage; Gear; Lubrication and the article following on Motoring.

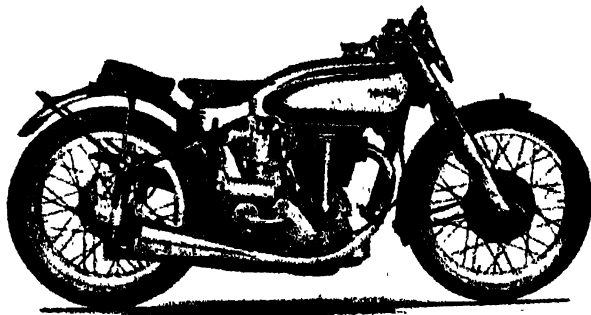
The prospective motor cyclist should refer to the legal portion of the following article on Motoring, where particulars are given about preliminaries such as registration, car and driving licences, and insurance.

All types of motor cycle are naturally more economical than cars. The lighter machines afford a cheap form of travel, for their running cost over a fixed period is less than that of a railway season ticket for a comparable period. The chief objection to using a motor cycle for business purposes throughout the year is the exposure of the rider to all weathers. This is not particularly serious when direct transport from home to office or factory is desired; a machine of moderate horse power can be equipped with windscreen and leg-shields, so that the driver can keep dry and warm in light waterproof overalls. But if the rider's duties involve numerous stoppages he will be bound

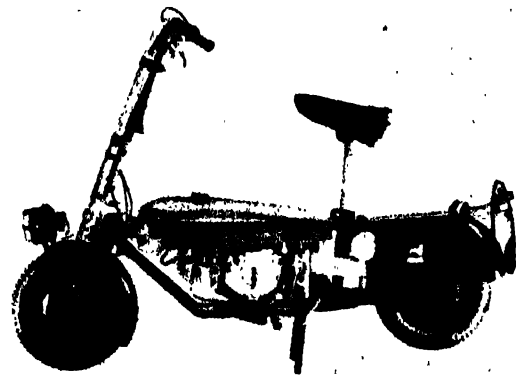
to make calls in muddled overalls, which is usually objectionable.

No elderly person with a weak heart or chest should face the exposure of a motor cycle, or the exertion of using the foot starter; but to the rest of the community, including women, the motor cycle offers the cheapest means of private mechanical transport, both for pleasure and for utility. Serious stoppages are uncommon with a good machine, and petty stoppages are soon set right on the road.

It is not possible to generalise about the cost of owning and running a machine, as the market embraces a great variety of types, ranging from the bicycle fitted with a mini-motor, and light machines like the Corgi, up to the 8 h.p. model capable of 100 miles per hour. Sidecars and three-wheeled runabouts are also obtainable, the latter being as comfortable as a small car.



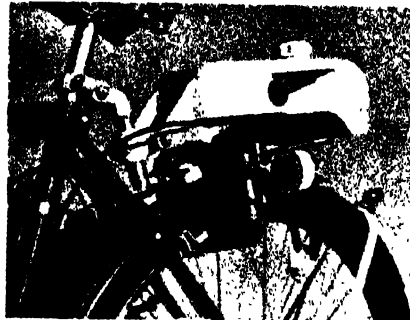
Courtesy of "The Motor Cycle"
Motor Cycle. Norton 490 c.c. with overhead-valve engine. Right: Corgi folding model weighing 85 lb., with 88 c.c. two-stroke Spryt engine; seat and handlebars fold flat. Petrol consumption is 100 m.p.g.



Courtesy Jack Olding & Co.

One of the most successful and sturdy light-weight motor cycles is the Corgi illustrated on this page. It has a remarkably powerful engine for its size, and gives good performance in hilly country. The saddle and handlebars fold flat, so that it occupies little garage space.

(about 2½ h.p.) is the most practical. Smaller engines must be geared rather low to enable the machine to climb steep hills and to maintain a good speed against a head wind.



Motor Cycle. Left, and above. Pedal bicycle motorised by mounting a 1 3 h.p. engine over the rear wheel. Transmission from the engine is by a roller bearing on the tire.

Courtesy Minimotor

But a 2½ horse power engine has ample power for all ordinary purposes, and can be run quietly like a good car. It is the best all round machine for young and middle-aged people, and is quite suitable for the beginner, being easy to start, inexpensive to maintain, not cumbersome to handle in the garage, and reliable on the road. The more powerful types of 500 c.c. (3½ h.p.) and upwards, can fairly be compared to the sports cars. They are unnecessarily powerful, and are chiefly bought by the sporting type of rider, who has no objection to weight, and indulges at times in very high speeds. Alternatively, the big-engined bicycle can be used for pulling a sidecar.

Overhauling. One advantage which the motor cycle has over a car is the simplicity with which it can be dismantled for overhaul and periodical adjustment. Routine attention consists in keeping the engine free of excessive

carbon deposits, attending to the sparking plug so that the gap is correctly adjusted, cleaning the carburetter, and (in four-stroke engines) maintaining the valve tappet clearances at the right setting. At intervals, other matters must be attended to. The transmission, particularly the short countershaft chain connecting the engine to the gearbox, should be seen to from time to time, and the brakes, clutch, and engine controls should, in addition, be adjusted in order to take up the wear that develops in all types of machines after long periods of service.

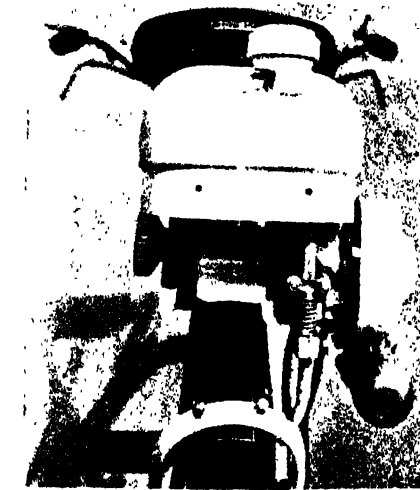
Pillion Riding. Coroners and magistrates often denounce the practice of carrying a passenger on the carrier of a motor cycle. It is by no means so dangerous as might be supposed. The insurance companies frame their premiums in accordance with accurate statistics. If a motor cyclist wishes to carry a pillion passenger, he must pay an extra 50 per cent. on his premium. Obviously, two people will be endangered in any accident, with a pillion rider aboard, and we should therefore expect the premiums charged to be double that for a solo machine, instead of being, as they are in fact, only 50 per cent. higher.

Undoubtedly the presence of an extra weight of perhaps 10 st. or more at the stern of the machine must affect control to some extent; but the insurance data suggest that the added risk is negligible, and is really limited to the chance of two people being hurt instead of one. However, it is obvious that nobody should carry a pillion passenger until he has ridden several thousand miles alone, and has become a tolerably expert driver. It is an offence to take a passenger on anything but a proper seat.

Sidecars. Despite the light motor car, the sidecar retains its popularity. Quite a serviceable sidecar outfit of 2½-3½ horse-power can be bought complete for about half the cost of the smallest new car. Running cost, show a similar ratio, as the tax and insurance, fuel bill, and tire bill, of the small car will be twice as heavy.

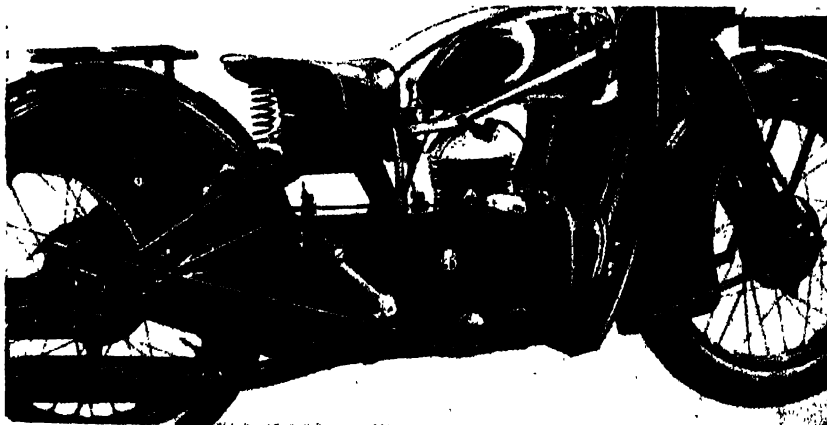
Specification. As motor cycles are designed by experts who are themselves practical riders, and who can keep in business only by offering the public a machine which is good value for the money, it is unnecessary to discuss specification in detail.

Purchasing the Machine. The motor cycle should be bought locally, if possible. The agent receives a commission on the sale of a new machine, and is expected to give his customer a certain amount of service, especially if the customer is a beginner. But if a customer residing in Westmorland, for example, buys from a London dealer, he cannot hope for any free service. There is one exception to this rule of buying locally. If a rider is buying his second or third machine, it may be desired to trade off to good advantage an old machine in part payment for the



There are also available a number of power units for fitting to the rear or front wheels of ordinary pedal cycles. The Minimotor shown on this page gives a speed of 25 m.p.h. for a petrol consumption of 240 m.p.g. All controls are on the handlebars, there is no gear, and the transmission can be disengaged from the road wheel.

Larger Bicycles. The touring classes include machines from 2½ horse power to 8 horse-power, varying in price accordingly. The more powerful a machine is the more it will cost to run and the more difficult it will be to handle when its engine is stopped; for example, in wheeling it out of its shed. In this touring class the machine of 350 c.c.



Motor Cycle. Constructional features embodied in a well-known British type, Francis-Barnett "Cruiser," in which gear-box and crankcase are cowed in, showing also leg shields.

Courtesy of "The Motor Cycle"

new one. If he lives in a remote place, his local dealer may lack facilities for re-selling second hand machines, and may make him a much poorer allowance than a big London dealer will. In such cases it may pay to sacrifice the service facilities in return for a higher exchange allowance.

Learning to Ride. The three requisites are a good handbook, a friend to act as a tutor, and a suitable machine. Excellent handbooks are published by the motor cycling journals and other firms. A local rider will always give the initial instruction on some quiet road, and confidence comes with amazing rapidity, as the machine is so low and steady that from the outset it feels much safer than a pedal cycle. An initial apprenticeship on a pedal cycle is always desirable, as it familiarises the rider with various road emergencies, and gives him a certain amount of road sense. But such an apprenticeship is not essential, and many men and women take up motor cycling without ever having learned to ride a pedal cycle.

The beginner need not be afraid of damaging the machine. It is not in the least likely that he will do it any harm, provided always that he lubricates the engine adequately. If he under-oils it he may wreck the engine in five miles. Therefore he should not attempt to run it until he has had the lubrication system thoroughly explained, and ever afterwards he should verify his oiling at short intervals until he learns to recognize, from the beat of his engine, whether it is properly oiled or not. The working of a typical simple splash lubrication system is illustrated in Fig. 2. The toolbag will contain a booklet explaining this important matter in detail, and any local rider will demonstrate its action to him.

Before he risks a solitary ride, he should further ask his dealer or a friend to show him how to mend a puncture. In all probability his tires will not puncture for 3,000 miles, but he cannot turn a heavy machine upside down to get at the tire, as he would with a pedal cycle, so a practical demonstration will be of real value.

Before taking to the road the beginner should master the art of stopping the machine. The engine can be stopped in two ways, either by shutting the throttle or lifting the exhaust valve. Two brakes are available for bringing the machine to a stop—a rear brake, operated by a pedal, and a front brake operated by a pull-up lever under the right grip of the handle bar. Some novices are a little apt to become excited in any sudden emergency, and to lose their heads. They should school themselves to shut off the engine and apply the brakes instinctively.

The ordinary traffic signals must be given. These are explained and illustrated in the article on motoring that follows. Very abrupt braking should never be attempted on wet, greasy surfaces, or on loose gravelly roads. Except on firm surfaces the brakes should be applied progressively and firmly, rather than abruptly. Generally speaking, all changes of speed should be executed smoothly, without jerk. High speed should be entirely eschewed except on deserted roads, and the novice should not attempt high speed for at least three months after starting to ride.

Starting the Engine. A lonely novice is apt to experience some trouble in starting engines of 350 c.c. and over, the smaller engines never give any serious trouble in this respect. Such an experience should not discourage the tire. Even racing engines of 500 c.c. are tolerably easy to start when they are tackled in the right way, and the owner will soon learn how to operate the controls so as to obtain a prompt start. If his difficulties persist, he should ask the dealer or an expert local rider to give him a demonstration, both with the engine cold and with the engine warm.

The first essential is that the engine should be free; it is quite impossible to start a stiff engine easily. For this reason the proper amount of the correct oil should be used, since cold oil, used to excess, gums up a piston rather tightly. If the engine is cold the carburettor should be tickled rather liberally, but this should be omitted when the engine is warm. For the rest the spark should be advanced about two-thirds; note the exact setting whenever a specially easy start is obtained. The throttle should be opened very little. Here, again, it pays to note the exact position when success results.

If there is an air lever, it should be shut with a cold engine, and perhaps opened a

all diagnosis of motor troubles is briefly summarized here.

A petrol engine must work subject to three conditions, namely (1) If it is in perfect order mechanically. (2) If a proper spark is occurring at the points of the sparking plug. (3) If the carburettor is delivering the correct charge of gas. In other words, the cause of a stoppage is concerned with the ignition, with the gas charge, or with the engine. If the beginner can clear up this initial problem, he can at once dismiss from his mind two thirds of the potential troubles and concentrate on tracking down his actual trouble in a very restricted field.

The trained rider looks the machine over swiftly when a stop occurs. He makes sure, perhaps, that petrol is reaching the carburettor by pressing the tickler. He eyes the engine to see if he can spot any broken part, and touches his kick-starter to see if the valve tappets are working normally. (The operation of the valves of a single cylinder side-valve, four-stroke motor cycle engine is diagrammatically shown in Fig. 1.) If all is well so far, he forms a preliminary expectation that the trouble is ignition, and unscrews his sparking plug. Very probably the points are fouled with carbon or bridged with soot or oil; he cleans the plug and goes on his way in a couple of minutes.

Sometimes matters are not so simple as this. Perhaps the plug looks clean and healthy. In this case he may test the spark. This is done by jamming it (with cable still attached) in some nook on the cylinder head, so that only the thick end of the plug touches the machine. He then raises the valve-lifter and kicks the starter. A splendid spark jumps the plug points, so that his trouble is not connected with the ignition. Perhaps 90 per cent of motor cycle stops are due to dirty plugs, and if the novice carries a spare plug and inserts it under such circumstances, he will surmount most of his early stops.

As the spark is perfect the rider has eliminated a third of the field of possible trouble, and he next suspects his carburettor. This embraces one or more very fine holes through which petrol is forced to vaporise it into gas. It is a simple matter for a speck of dirt to seal these spraying holes and in this way to stop the production of gas.

His next step will be to take out the jet, as it is called, hold it up to the light and peep through it. A carburettor booklet in the toolbag will contain sketches indicating the jet and the manner of dismantling the carburettor. If the jet is stopped up, he blows through it or clears it with a fine wire, and all is well. He must, however, be very careful not to alter the size of the jet by using the wire or a needle roughly. Only in the case of a mechanical breakage will further progress be impossible. This is an extremely rare happening, and is best solved by "flagging" a passing lorry and getting the driver to transport the machine to the nearest garage. The principles and working of two-stroke and four-stroke engines are dealt with in the article on Internal Combustion Engine; systems of Lubrication are explained under that entry, while there is much information of use to the motor cyclist in the article on Motoring.

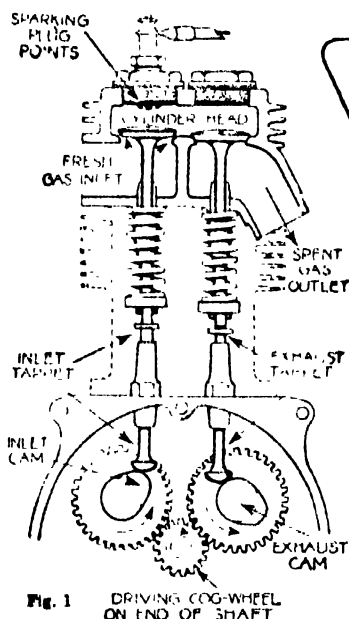
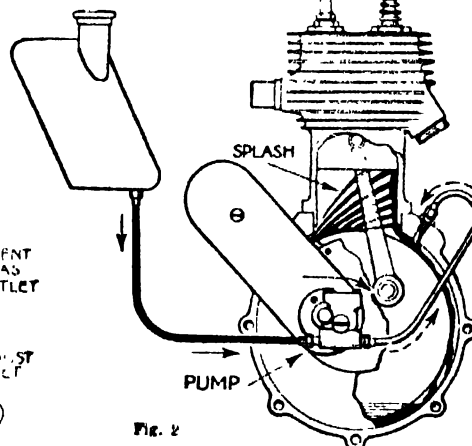


Fig. 1



Motor Cycle. Fig. 1. Diagram illustrating operation of the valves of a single-cylinder four-stroke engine. Fig. 2. Diagram illustrating typical simple splash lubrication system.

shade when the engine is warm. If there is a mixture lever, it should be set at "rich" with a cold engine, and at "weak" with a warm engine. The kick starter should be gently felt until it encounters the maximum resistance, in which it should be allowed to return to its topmost position. It may then be eased a fraction of an inch past this position by gently pressing it with the valve lifter raised. The engine should then respond to a strong downward thrust with the foot, the valve lifter being dropped as soon as the kick starter begins to move down.

Trouble on the Road. Nothing is more bewildering to the novice than a complete stoppage of his engine when he has not the faintest conception of the cause. The handbooks referred to above will give him an encyclopedic analysis of the various possibilities, together with much assistance in effecting a diagnosis and in executing a repair. Such a handbook should be carried in the pocket. At the worst, he need not be seriously disturbed, as there is a splendid camaraderie of the road, and before long some more expert rider is likely to come to his assistance.

However, it may set the beginner's mind working in a scientific direction if the key to

MOTORING AND MOTOR LAW

Instructions for Driving, Licensing and Insuring the Car

As a preceding article has dealt with the choice and care of the car, this one deals with the duties and responsibilities of the owner and the driver, especially as affected by the important Road Traffic Acts and regulations. In the legal section the prospective motorist will find information about the necessary preliminaries such as registration, the procuring of car licence and driving licence, and insurance.

The management of a motor car on the road is perhaps a nervous undertaking for the first 100 miles or so, but afterwards, when the handling of the car has become more or less automatic, there is a danger that the driver may become too confident, too casual, or too daring. It is not possible to teach oneself to drive from books alone, and it is inadvisable to learn to drive on one's own car. The dealer who supplies the new car can usually provide a suitable tutor, and a car. There are also many schools where one may learn the essential mechanics of a car and how to drive it.

The new motorist must pass an official test before being granted a driving licence. He must feel at home in the car and should have reached that stage when the various sequences of operation are more or less automatic before he enters for the test. This is not difficult, although when gear changing the novice may at first be somewhat awkward. To change gear without noise requires a great deal of practice and is a matter of doing the right thing at exactly the right time.

Changing Gear. The speed of the sliding gear wheels on the main or final driving shaft is controlled by the speed of the road wheels. The fixed gears on the lay shaft are always driven by the clutch shaft, their speed corresponding to that of the engine when the clutch is engaged. Therefore, if a silent gear change is to be made, the speeds of the teeth of the two wheels to be engaged must be as nearly as possible the same at the instant the change is made.

Changing up from a low gear to a higher is easier than changing down. With most cars all that is necessary is to de-clutch with the accelerator pedal raised so that the engine speed will decrease. After a second or two the higher gear may be quietly engaged and the clutch may then be re-engaged and the engine accelerated.

Briefly, this procedure is as follows:

1. Accelerate the car up to about 8 miles per hour in first gear.
2. Let the accelerator pedal come right up.
3. Press the clutch pedal right down.
4. Move the gear lever out of the first gear notch.
5. Wait for engine speed to decrease a little.
6. Move gear lever into the second gear notch.
7. Let the clutch pedal in smoothly but quickly.
8. Press down the accelerator pedal.

The same procedure is followed when changing up into higher gears.

The main point to remember when changing down to a lower gear is that the engine speed is higher in relation to the speed of the car when one of the lower ratios is used than when in top

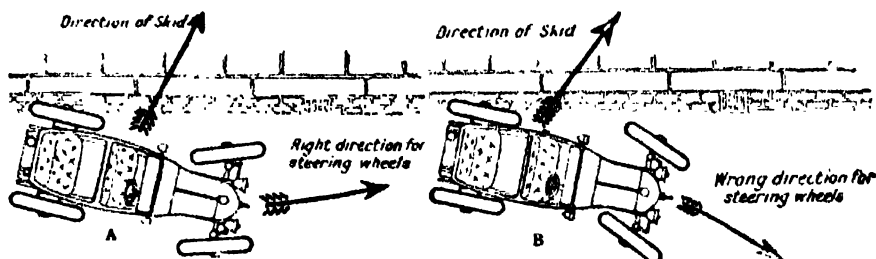
gear. In top gear the engine shaft rotates about five times to one of the road wheels, in the middle gear of a three-speed gear box about nine to one, and in the bottom gear, about fourteen to one. When a lower gear is to be engaged, therefore, it is first necessary to increase the engine speed with the gear in neutral.

To change down, by the method known as double clutching, the accelerator pedal should be eased slightly, the clutch pedal pressed down and the gear lever moved into neutral. The engine will accelerate when free

the accelerator pedal is kept hard down or is eased slightly depends upon the characteristics of the car. The former is better if it can be managed.

Gear changing difficulties are, however, entirely eliminated in the Wilson pre-selective gear box, in which a small lever, carried on the steering column, as shown in Fig. 1, is set by the fingers before making the change. The gear is not changed until the clutch pedal is depressed and re-engaged.

The gear itself is shown diagrammatically in Fig. 2 with the several epicyclic groups spread out, but actually all four groups are close together. Each group consists of a central sun wheel, an outer toothed ring or annulus, and several planet pinions meshing with both the sun wheel and annulus, the different sets being interconnected as shown. To engage the several lower gears, brakes (not shown in the drawing) are applied to one



Motoring. Fig. 3. Skidding. A. How to steer out of a skid. B. How steering the car in the wrong direction will increase skid.

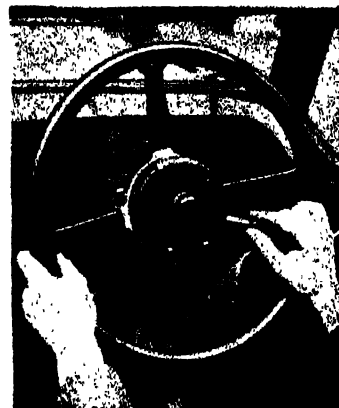
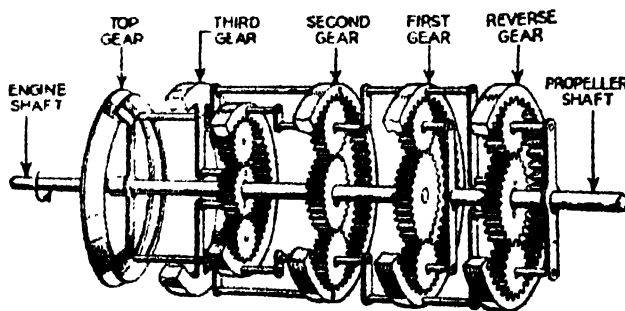
and the clutch should be quickly re-engaged. This raises the speed of the gears on the counter shaft. The clutch pedal should again be depressed, and the gear lever moved into the desired position when the clutch is once more engaged, and the engine accelerated. If this operation is well practised, slowly at first, and gradually speeding up, the driver of the car will be enabled to carry out this apparently complicated operation in about a second of time at any speed.

or more of the outer members as required. The direct speed is obtained by engaging the top gear clutch.

The reader is reminded that the brakes, clutch, and accelerator pedals should not be pressed or released violently. A progressive action is desirable, especially in the case of the accelerator. Further, excessive use of the brakes is not recommended, in fact a good driver rarely uses his brakes, but relies generally upon his engine and supplements its retarding effect by the brakes when descending steep gradients or stopping. An exception to this occurs, however, when the roads are slippery, as mentioned in the section below.

Skidding. Side slipping or skidding with rare exceptions always affects the back wheels, and is due to excessive retardation by the brakes acting on the wheels themselves or on the propeller shaft, or by the engine acting as a brake. The last mentioned is often overlooked, but it is sufficient to start a skid on roads which are only half wet, as when rain has just started or when the surface is drying. It is inadvisable at such times either to apply the hand brake or to use the engine as a brake, since both act on the rear wheels only. Brakes applied to the front wheels alone cannot cause a skid, and skidding is much less likely with cars having four wheel brakes properly adjusted. Fig. 3 shows, A, how to steer out of a skid, and B, how steering the car in the wrong direction will increase skid.

The New Car. The following hints will be found of value to the owner of a new car. When taking delivery ask the agent to explain thoroughly the controls and general details of the car, and to go over the important subjects dealt with in the instruction book. The first 500 or 1,000 miles are the most important in the life of a new car, and a limit of 30 miles an hour on top gear during this period will save a considerable amount of expense in the future, while in addition it will improve the ultimate performance of the motor car when it has been "run in." Lower limits should be observed on the lower gears in order to avoid excessive engine speed.



Motoring. Fig. 1. Gear selecting lever for Wilson gear box. Fig. 2 (Top). Diagrammatic sketch showing arrangement of gear wheels.

1. Improved Gears, Ltd. 2. The Autocar

This procedure may be summarised as follows:

1. Ease the accelerator pedal slightly.
2. Depress the clutch pedal.
3. Slip the gear lever into neutral.
4. Engage the clutch again to speed up the clutch shaft and countershaft gear wheels.
5. Depress the clutch pedal.
6. Slip the gear lever into the lower gear position.
7. Let the clutch pedal up again, quickly but smoothly.

It is possible after some practice to make these changes so rapidly that they may be described as two quick dabs on the clutch pedal, made in time with the two movements of the gear lever. Whether



Motoring. Cleaning the car. Fig. 4. Washing down the roof with hose and sponge. Fig. 5. An old, softened scrubbing brush is ideal for cleaning radiator grille and other plated parts. Fig. 6. Wheels should be cleaned with brush and hose after the wheel and tire have been well soaked. Fig. 7. Accumulated mud behind bumper and under mudguards is best removed with a soft brush having a flexible wire handle, the cleaned parts then being hosed down.

Courtesy "The Motorist"

Washing the Car. Some sort of routine in washing a car is essential if time is to be saved. (See Figs. 4-7.) A good strong sponge should be used for the exterior, including wings, but not for the wheels, bumpers, and so forth. The chamois leather which is used for drying off the exterior of the car can be used for cleaning the interior, and this leather should be kept near the driver's seat for occasional cleaning of the windscreen or windows on a long journey. A spot of grease will ruin a chamois leather, and it is well to beware of the grease that exudes from lubrication nipples and spring leaves under the car.

Motoring Holidays. The cost of motoring holidays varies enormously. On the one hand they can be very expensive, and, on the other hand, the cost can be actually less than that incurred when staying at home. One expense that is often overlooked is that of buying meals away from home, an item which alone can easily exceed the entire cost of keeping the car in commission. It is worth remembering that picnic meals cost little, if any, more than those partaken at home. A tour in which the party puts up at a different hotel every night is the most expensive way of holiday-making with a motor car. To tour from a centre is cheaper, the party staying for some time at an hotel, boarding-house, or rooms, and exploring the neighbourhood in the car. The other extreme is to carry tents for camping. Tents and equipment can be hired at reasonable charges. It is possible to sleep in some cars. (See Figs. 10, 11 & 12.)

Another form of holiday is a camping tour with a caravan (q.v.) towed by the car.

Traffic Signals. The Highway Code issued by the Ministry of Transport includes a system of standard signals to be used by the police or other official traffic controllers, and also signals which a driver should use to give notice of his intentions. The standard police signals are as follows.

1. A vehicle approaching the policeman is halted by extending the right arm and hand towards the vehicle. Where two vehicles are approaching along different roads, the policeman faces the vehicle to be stopped.



2. A vehicle approaching from behind is halted by extending the left arm and hand horizontally, with the back of the hand towards the vehicle.

3. Vehicles approaching simultaneously from in front and from behind necessitate the use of both arms as described under (1) and (2). This signal is commonly used at cross-roads.

4. To bring on a vehicle from his front, the policeman beckons on the driver with the right hand and forearm; he should look towards the driver to show clearly that the signal is intended for him.

5. When the policeman is releasing traffic which has been stopped, or is bringing on vehicles from his right, he looks towards the driver and beckons him on with the right arm but without turning his body.

6. When bringing on vehicles from his left he looks in that direction, and gives a similar signal to that in (5), but with his left arm beckoning forward waiting vehicles.



Motoring. Fig. 8. Recognized signals given by police and other traffic controllers. See text.

From the Highway Code, by permission of H. M. Stationery Office

An engine should always be given the opportunity of warming up from cold for a few minutes before starting off on the road, to allow the oil to thin down and pass through the bearings and on to the cylinder bores. When the oil-pressure gauge drops back to the normal running point the engine will be warm enough. After the first 300 miles, change the oil in the engine sump. The old oil has been subjected to heavy work with tight engine bearings, and will have lost its viscosity and contain impurities. Check the tire pressures regularly, with a gauge.

The new owner should learn how best to start the engine without using the starting motor several times on each occasion. There is a certain position for the throttle, ignition, and strangler controls, which will give the quickest start, either by hand or when using the starting motor. Learn to understand the ammeter on the instrument board, and the readings shown when some or all of the lights are used, and when the dynamo switch is in the "off," "charge," or "summer charge" and "winter charge" positions. Remember that coil ignition takes a fair amount of current from the accumulator, and that, if the ignition is left in the "on" position for some time when the engine is not running, there will be a considerable drain on the accumulator. The accumulator should be inspected according to mileage, and the acid level maintained about $\frac{1}{2}$ in. above the tops of the plates, by adding distilled water.

The recognized signals to be given by the driver (Fig. 9) are as follow:

(7) A warning that a driver is going to slow down or stop or turn to the left is given by extending the right arm and hand horizontally towards the outside of the car with the palm downwards and moving the hand slowly up and down.

(8) When about to turn to the right, the right arm and hand are extended horizontally straight out from the outside of the vehicle with the palm towards the front.



Motoring. Fig. 9. Recognized signals given by driver to indicate his intentions to others. See text
From the Highway Code, by permission of Controller of H.M. Stationery Office

(9) An invitation to a following vehicle to overtake on the right is given by extending the right arm and hand downwards and moving them backwards and forwards so as to beckon the vehicle forward.

(10) The desire to go straight ahead is indicated to the traffic controller by moving the hand and forearm well forward and backward in a vertical plane.

(11) When desiring to turn to the left the hand and arm are pointed in that direction across the body.

(12) When wishing to turn to the right the arm should be extended horizontally with the palm towards the front, this signal being identical with number (8) above.

In 1952 the Ministry of Transport in Great Britain proposed making certain modifications in the above system of driving signals.

Legal Considerations: Buying a Car. A motorist who proposes to sell his present car and buy another one will, as a rule, receive a larger price for his old car if he arranges to get a new car of the same make and "trades-in" his old car in part exchange. It is always advisable to do business with a dealer who holds an agency for the car to be bought. The terms of the sale of the old car should be put into writing, otherwise the purchaser can legally refuse to take the car. The agreement does not require any stamp. If any accessories fitted on to the car are not to be sold this should be made clear at the time of sale.

The prices quoted for new cars are usually ex-works, that is, the purchaser will be required to pay the cost of delivery from the manufacturer's works in addition to the price

quoted. Most makers give guarantees with their cars and several include free service for some time after delivery. This guarantee and service only apply to parts of the car which the makers have themselves manufactured; but similar guarantees are usually also given by the makers of the accessories.

In the case of second hand cars there is no maker's guarantee, but some dealers themselves guarantee the car for some months. In most cases, however, the purchaser must take the car as he finds it, and so, unless he knows

something of its history, he will usually be well advised to spend a few pounds on having the car overhauled by some expert and a report obtained before purchasing. The motoring associations make examinations of this kind for a small fee.

A prospective purchaser should remember that the mere fact that the seller holds a registration book for the car in which his name appears as that of the registered owner does not necessarily mean that he has any right to sell the car. Cars held on the hire purchase system are registered in the name of the hirer and not in the name of the hire purchase company to which the car really belongs. If the hirer sells the car he does so in breach of his contract with the hire purchase company and they will be entitled to retake the car from any purchaser, who will thus lose the car without compensation, although he can recover the money he paid for it from the seller if he can find him.

Registration and Licence. Before the purchaser can drive the car he must see that it is registered and licensed and provide himself with an insurance certificate and driving licence. An insurance certificate or cover note must be produced before a road licence can be obtained. If the car is a new one, the dealer will usually arrange for its licensing and registration, and hand to the purchaser the registration book. If the dealer does not do this, the purchaser must himself obtain the registration book and licence from his local council. In the case of second-hand cars, the purchaser must get the registration book from the seller, insert his own name and address in

the book and send it at once to his local council. Any licence in force for the car at the time it is bought will continue in force until the date on which it expires.

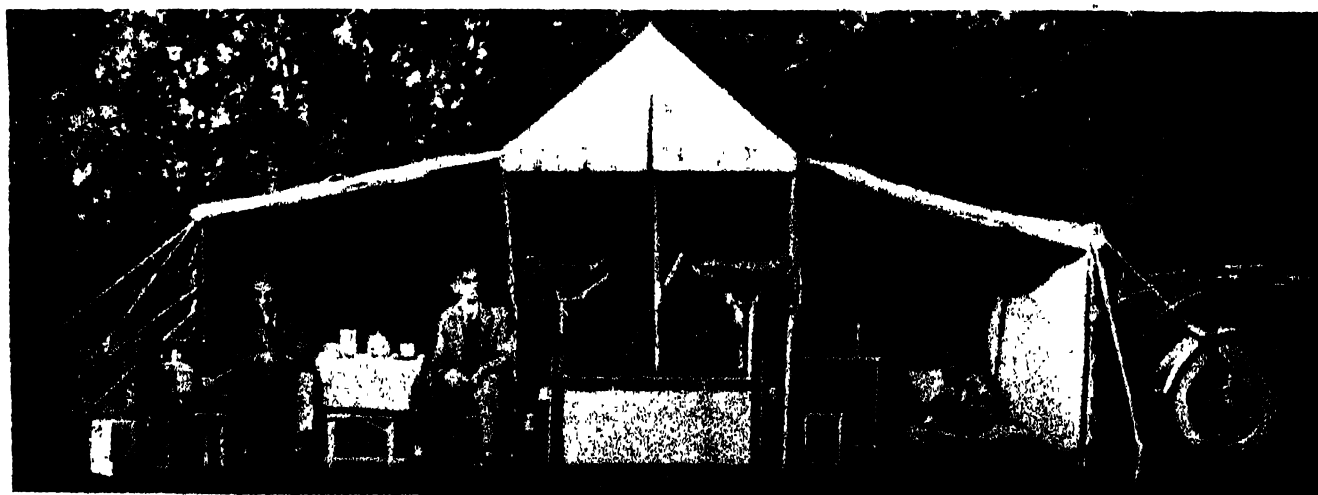
A licence may be taken out either for the whole or the remainder of any current year, ending December 31st, or for the whole or the remainder of any of the four quarters of the year ending March 24th, June 30th, September 30th or December 31st. If a licence is required, say, in May until the end of August, two licences will have to be taken out, one for the remainder of the quarter ending June 30th, and then, at the end of that quarter, another licence for the quarter ending September 30th.

Cost of the Licence. In 1952 the annual duty on cars used for private purposes and first registered before 1947 was £1 5s. for every unit of horse-power. Cars first registered in 1947 and after were taxed at a flat rate of £10

a year irrespective of horse power rating. The Budget of 1952 proposed to tax all cars, irrespective of the date of first registering, at a flat rate of £12 10s. a year. If private cars are used for trade purposes, e.g. as delivery vehicles, they are taxed as goods vehicles. The annual duty on motor cycles was in 1952: under 150 c.c., 17s. 6d. per annum; over 150 c.c. but under 250 c.c., £1 17s. 6d.; over 250 c.c., £3 15s. Motor tricycles (including three-wheel cars) pay an annual tax of £5 a year provided their unladen weight does not exceed 8 cwt.; when they exceed that weight they are taxed as ordinary motor cars.

The licence may be renewed at any time within the fortnight preceding the date on which it expires. The authorities usually allow also a fortnight after the expiry of a licence for its renewal, but motorists should be careful not to use a vehicle during the period after the licence has lapsed unless they intend to renew the licence, as the police frequently take the registration numbers of vehicles seen on the road during that period and institute proceedings if the licence is not ultimately renewed. The maximum penalty for using a vehicle not properly licensed is a fine of £20 or three times the licence duty, whichever is the greater.

If any alteration is made to the car—e.g. by painting it another colour, or using a vehicle licensed for private use as a commercial vehicle, or if the owner changes his address, the registration book must be sent to the local council with particulars of the alterations. The owner must not himself alter the book, except in event of change of address.



Motoring. Fig. 10. Tent trailer fully erected, showing sleeping arrangements and extra lean-to tents at side. See also Fig. 11
Courtesy of Car Trailers, Ltd

The Insurance Certificate. The insurance certificate will be obtained from the company with whom the vehicle is insured. Every motorist is now compelled to insure against injuries to third parties, excluding passengers travelling in the car, otherwise than for hire, or servants of the owner.

The first step in taking out an insurance policy is the filling up of the proposal form. This form contains a number of questions which the motorist must answer relating to (1) the occupation of the motorist; (2) the nature of the risk to be covered and particulars of the vehicle; (3) the previous driving record of the motorist, including details of any accidents in which he has been involved. It is most important that all these questions should be correctly answered, for an inaccurate answer, even if made innocently and even if quite immaterial to the risk, may enable the insurance company to escape liability under the policy. In addition to answering carefully all questions that he is asked, the motorist must also disclose any fact known to him which would be likely to affect the mind of the insurance company in deciding whether or not they should accept the risk.

When the insurance company receive the proposal form they may not issue a policy at once. There may be some inquiries to be made in consequence of the answers in the proposal form, and until these inquiries have been completed no policy is issued, but a cover note is sent to the motorist. Once this has been issued, the motorist is as fully insured as though he had the policy, but the cover note is only valid for a short time—usually 14 days.

If the policy has not been issued before the expiry of the 14 days the motorist must apply to the insurance company to have the cover note extended. When the company have made all inquiries as to the answers in the proposal form they will either issue a policy or else refuse to accept the risk and return the premium paid, less a proportionate sum for the period during which the motorist has been covered by the cover note.

Penalties for Non-Insurance

It is now a very serious offence to use or to allow anyone else to use a vehicle which is not covered by insurance. The insurance must be against injury to third parties; a motorist is not required to insure against injury to himself or to his non-paying passengers, or against damage to the property of third parties, although every motorist should include these risks in his policy. The penalty for using a vehicle not properly covered is a fine not exceeding £50 or three months' imprisonment, or both. Disqualification from holding a driving licence for at least 12 months will follow automatically, unless there are special reasons why the disqualification should not be imposed.

The insurance certificate or cover note must be produced on demand to any police constable while the vehicle is on the road, and also after an accident involving personal injuries (see below). If the driver is unable to produce the certificate at the time, he may avoid a prosecution by taking the certificate in person within five days to some police station selected by him when asked to produce it.

Driving Licence. Driving licences are issued by the local council. Anyone who drives a motor vehicle without a licence or who employs any unlicensed person to drive is liable to a fine of £20 for the first offence and £50 or six months' imprisonment for later offences. The licence costs five shillings and lasts for twelve months. The licence must be produced to any policeman under penalty of a fine not exceeding five shillings. A motorist will not, however, be fined for failing

to produce his licence if he produces it in person within five days at some police station mentioned by him when he is first asked for the licence.

The minimum ages at which persons may drive are sixteen for motor cycles or invalid carriages, seventeen for ordinary motor cars, and twenty-one for heavy motor vehicles.

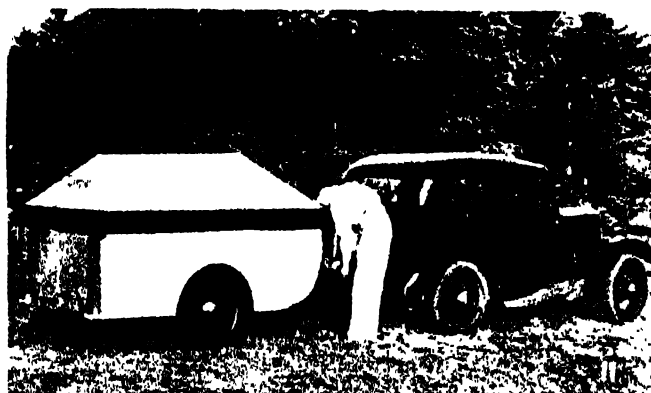
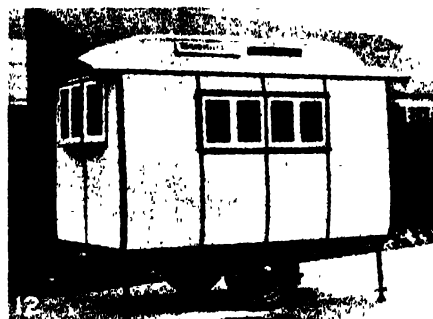
Before a licence can be obtained the applicant must make a declaration as to his physical fitness in which he must answer questions relating to various ailments. If he has suffered from epilepsy, any mental disorder, attacks of dizziness or fainting, or if he is unable to read at a distance of 25 yards (with glasses if worn) the number plate of a motor car, he will not be allowed to obtain a licence. If he is suffering from some other disability he may obtain a licence if he passes a special driving test, usually in a vehicle specially constructed for a disabled driver.

Persons not suffering from any disability are also required to pass a driving test unless they held a driving licence before April 1st, 1934. A provisional licence valid for three months may be obtained (cost 5s). An L sign must be shown on the vehicle, and a qualified driver must accompany the learner.

The applicant must know the Highway Code and prove he is able to drive the vehicle for which he wishes to obtain a licence. A

be liable to a fine if this regulation is not observed. The driver must be at all times in a position from which he can have full control of the vehicle.

Every motor car must carry two white lights to the front and one red lamp to the rear during the hours of darkness. In "summer time" this means from one hour after sunset until one hour before sunrise, and during the rest of the year from half an hour after sunset until half an hour before sunrise. Bicycles without sidecars require only one front lamp and a rear lamp. All lamps (except those not over 7 watts and fitted with frosted glass) must be so constructed that the beam of light



Motoring. Fig. 11. Tent trailer at the camping ground. Fig. 12. Rapid type of trailer caravan. See also page 187.

Fig. 11, courtesy of the T. & L. Co., Ltd. Fig. 12, Fisher Motor Caravans, Ltd.

licence to drive a motor cycle does not entitle the holder to drive a motor car. The fee for a driving test is 5s. Any person who has failed may apply again after one month.

When a driver has been convicted of any motoring offence, particulars of the conviction may be ordered to be endorsed on his driving licence, and these endorsements will be copied on to any new licence. It is a serious offence to apply for a new licence without disclosing the fact that the old one was endorsed.

Disqualifications from driving may be imposed on a conviction for many motoring offences, and in the case of some offences—e.g. driving while under the influence of drink or drugs—must be imposed unless special mitigating circumstances are present. While disqualified, the driver is liable to imprisonment if he drives any motor vehicle. The disqualification may be for any period, varying from a few weeks to life. Where the disqualification is for a longer period than six months, the driver may apply to the court after six months to have the disqualification removed, and if this application is refused, he may repeat it at intervals of not less than three months.

Brakes and Lights. Every motor vehicle must have two independent brakes in good working order. No vehicle must be excessively noisy, either on account of lack of repair of the vehicle or the faulty packing or adjustment of its load. Both owner and driver will

from them can be deflected downwards or to the left by some device so as not to dazzle any person standing more than 25 feet away and with his eye level not less than 3 feet 6 in. above the ground level. Every bulb showing a light to the front must have the wattage marked on it. In many towns local regulations permit vehicles to remain in parking places without lights. Information as to local regulations is contained in the Motorist's Pocket-

book, which may be obtained from the local registration authority. All wind-screens must be of safety glass.

Speed Limit. Every motor vehicle is limited to a speed of 30 m.p.h. in a built-up area. Certain vehicles have to observe a speed limit even though not in a built-up area, e.g. a motor car drawing a two-wheeled trailer, all the tyres being pneumatic. Buses and coaches are limited to 30 m.p.h., and lorries over 2½ tons to 20 m.p.h. Every motor car and motor cycle (except a motor cycle with an engine not over 100 c.c.), if it was registered for the first time on or after October 1st, 1937, must carry some form of speedometer. The penalty for exceeding the speed limit is a fine of not exceeding £20 for the first offence and £50 for later offences.

Driving Offences. Under the Road Traffic Act, 1930, dangerous driving is a serious offence, and it is also an offence to drive without due care and attention, or without reasonable consideration for other persons using the road. Anyone who drives a motor vehicle while under the influence of drink or drugs is liable to a fine not exceeding £50 or imprisonment for not more than four months, and to more severe penalties for later convictions. Pillion riding otherwise than astride on a properly secured seat is illegal. Drivers must strictly obey all police signals, and stop when requested to do so by a police officer. A penalty of a fine of £5.

It is an offence to leave a vehicle standing in a dangerous position, whether in town or country, and also an offence to obstruct traffic. No motor vehicle must be driven on to any land that is not part of a road, or on to any common land. A vehicle may, however, be parked on any land (not common land or private property) within 15 yards of a road.

Motorists entering strange towns should proceed carefully until they have familiarised themselves with any local by laws relating to the passing of trams and similar matters. The useful Motorists' Pocket Book, already referred to, contains a list of these local regulations, and may be obtained from most local councils. In many towns in Scotland it is an offence to pass a tramcar on the near side while passengers are boarding or alighting. Although such regulations are not found in England, the practice can be made grounds for a charge of dangerous or careless driving.

Accidents. When a vehicle is concerned in any accident causing injury or damage to any person, vehicle or animal (including sheep or dogs but not poultry) the driver must stop and, if required, must give his name and address and produce his insurance certificate. If for any reason he does not do this, he must report the accident and produce his certificate at a police station, or to a police officer, as soon as possible, and in any event within 24 hours of the accident.

A driver concerned in an accident should be careful not to make any admissions as to his liability, for if he does so his insurance company may repudiate liability. He should get the name and address of the person injured, or the driver of the other vehicle, and also the names and addresses of any witnesses. He should also find out if he can whether the witnesses think he is to blame for the accident.

The points of importance to be considered are (1) the side of the road on which he was driving at the time of the accident; (2) the speed at which he was travelling; (3) the exact width of the road and the state of its surface, etc.; (4) the place on the road at which the collision took place, measured exactly from the kerb or other mark; (5) the position measured in the same way of the vehicles after the accident; (6) the movements of the other party immediately before the accident, including such matters as speed, signals, etc. No attempt should be made to deal with any claim. The accident should be notified to the insurance company and the whole matter left in their hands.

A motorist is liable for all damage to property or injury to persons caused by his negligent driving. It is impossible to say generally what constitutes negligent driving. It may not be negligent to drive at 60 miles per hour on a clear straight road, whereas it may be grossly negligent to drive at 10 miles per hour in a crowded street on a wet night. Each case must be decided on its own facts. It may be said that anyone who departs from the ordinary rules of good driving will probably be held liable for any accident that may result.

Where both persons concerned have been negligent, neither will be able to recover damages against the other. This will not affect persons who are passengers in a vehicle which has been negligently driven. Thus, if Jones and Smith both drive negligently and collide, neither can recover against the other, but any passenger in either vehicle can recover against either Jones or Smith or both. Persons who give lifts to strangers in the country would do well to bear this in mind. Insurance against injuries to passengers (not carried for gain) is not compulsory and drivers who wish to be covered against this risk should see that it is included in their policy.

When anyone is killed as the result of an accident the driver of any vehicle concerned

will be required to give evidence at the inquest and the coroner's jury may bring in a verdict of manslaughter against the driver. In such a case the driver will later be tried for this serious crime, but before he can be convicted it must be proved that he has been guilty of gross negligence, something more than the negligence necessary to make him liable in a civil action for damages and amounting to a reckless disregard for human life.

MOTTLED SOAP. The name is given to a variety of soap containing coloured markings similar to the veins in marble. The mottled soap was formerly made from kitchen refuse, and the marbling was produced naturally from impurities in the fats or alkalis employed in the boiling.

The red mottled soap known as Castle soap owes its colour to the addition of green copperas, and being made with olive oil or similar oil produces a pure soap. See Soap.

MOULD : On Meat. Meat which is kept too long is acted upon by certain bacteria which cause it to become unfit for food. With the increased use of small household cold storage safes, various kinds of moulds will be seen upon meat, especially raw meat awaiting cooking. While harmful bacteria develop very slowly under cold storage conditions, moulds of fungous origin are frequently seen on the surface of the meat. Unlike bacteria, these moulds do not give rise to substances which are poisonous to human beings, and therefore do not render the meat unfit for food. In most cases the moulds are superficial and can be wiped off with a cloth. Black spot mould is the worst kind and penetrates most, but even this can be cut away with a very thin layer of meat, and the joint cooked with safety.

A common mould is the white one, the product of a moist atmosphere in the cold safe. In appearance it is very similar to that often seen upon cheese.

The most favourable condition for the growths of moulds is a humid atmosphere in

safes or pantries at about freezing temperatures. With care mould growths can be avoided; they are unsightly even if harmless.

MOULD : The Disease. The term mould is applied to a fungoid disease attacking plants in garden and greenhouse. For practical purposes it is synonymous with mildew (q.v.).

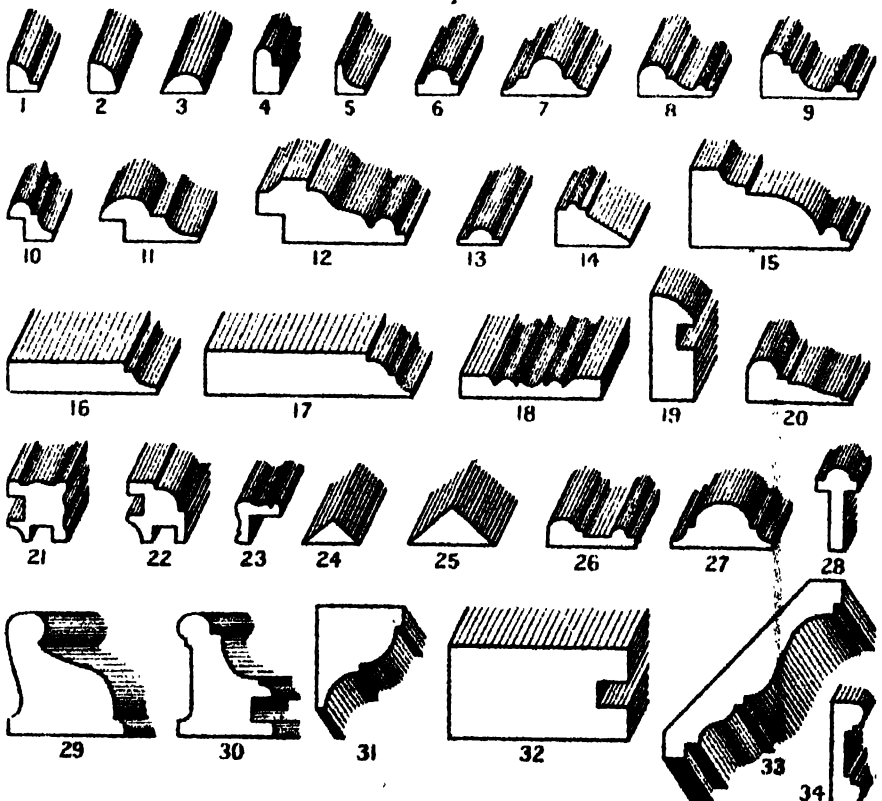
MOULD : In Gardening. Mould or loam in gardening is the top spit of earth which has been acted upon by atmospheric influences; it forms the base of potting composts. Commonly the term is used to express soil suitable for potting purposes, such as that obtained from old turves stacked until they are well matured. See Compost Heap; Loam; Potting; Soil.

MOULD : In Cookery. This is a shape made of tin, aluminium, china, glass, powder, or enamel, into which jellies, blancmanges, cake and pudding mixtures, etc., are poured. These moulds vary greatly in size and design.

Where kitchen equipment is limited and only two moulds are provided, it is a good plan to choose one rather plain oval shape and one border mould. Both sweet and savoury jellies can be moulded in the former and the latter can be used for fish or poultry or meat mousses or galantine dishes, the centre, when turned out, being filled with a salad covered with mayonnaise sauce. The border mould is also useful for shaping home-made sponge cakes.

Ordinary pudding basins can be used as moulds should there be a shortage of the latter. When greasing fancy moulds it is necessary to go into every part of the design. Pure olive oil is more satisfactory to use than butter for this purpose. See Butter; Cheese; Ice; Jelly.

MOULDING. A moulding is a strip of wood or other material worked to an ornamental pattern on one or more of its faces. In architecture, mouldings may be worked in stone or brickwork, or other material of which the building is made, to relieve the surface



Moulding. Figs. 1-34. Stock patterns which the home worker can procure from a timber merchant. The principal types are described in the text.

and act as an adornment. They are generally found in the form of curved section strings at the bases and jambs, and are used round openings for doors and windows. The householder is mostly concerned with mouldings for the embellishment of the interior of the house. Patterns are obtainable from timber merchants. Figs. 1-34 illustrate a number of useful mouldings which the amateur can procure from any good dealer in woodwork hobbies materials.

In the first row are beads, astragals and panel mouldings; Nos. 10, 11, 12 are rebated panel mouldings; 16, 17, 18 are for lid or plinth; 19 is a grooved drawer bottom moulding. In the fourth row are grooved corner moulding, edge moulding (23), glue blocking (24, 25), and a door closing moulding (28). Bottom row shows tray moulding (29, 30), solid cornice (31), door frame moulding (32), and cornice (33). Nos. 13, 14, 20, 26, 27, 31 and 34 are in oak, 16, 17, 18 in hazel walnut, and the rest in suitable hardwood.

Cabinet mouldings are made in a variety of patterns and in many different sizes for the decoration of furniture. Picture mouldings are in a class by themselves, and are dealt with in the article on picture framing. See Ceiling; Chest; Corner Dresser; Cupboard; Doll's House; Door; Grandfather Clock; Picture Framing; Wardrobe, etc.

MOULTING: Of Birds. Moulting is the process by which every year birds renew their plumage, shedding their old feathers and growing new ones. As far as the ordinary householder is concerned its interest is confined to the fowls, ducks, pigeons, parrots, or other kinds he happens to keep.

Although not a disease, moulting is a certain strain on the constitution of the bird, and care should therefore be taken that it is in good condition when the season for it begins. Precautions should be taken against damp, but as a rule very little change of diet is desirable, although this does good with some kinds of birds—pigeons, for instance.

Fowls. In the case of the domestic fowl the process of putting on new plumage starts in July and goes on until September, some birds moulting early and others late. Poultry keepers should endeavour to get their fowls to moult early, so that the birds may recover and get their new plumage before the cold weather sets in, and much can be done by judicious management. As a rule young hens moult far more easily than old ones, the average time occupied by the former being from 6 to 8 weeks. An old hen will sometimes take 3, 4, and even 5 months. Generally speaking, the average time is about 3 months.

The easiest way to accelerate the moult is to curtail the food supply of the birds, feeding sparingly for about two weeks and then giving them plenty of food of a nitrogenous character. Extra feeding should not begin until the fowls are actually in moult, that is to say, when the new feathers are growing. Feathering will be greatly assisted by giving each fowl a pinch of sulphur in its soft food every day. A little sunflower seed or hemp seed with the evening grain food is helpful.

Warm weather is more conducive to a rapid moult than when it is cold and wet, and care should be taken throughout to keep the birds warm. While the moulting season is on the run will be little troubled with feathers, and these should be cleared away daily.

Pigeons and Canaries. With pigeons moulting usually begins in April, and attention should be paid to the diet and general conditions. In particular the bird should be kept warm and protected from draughts, as a chill may have the effect of stopping the moult and will affect the health of the bird. It is well during moulting to feed a pigeon on bread soaked in water to which a little salt has been added.

Canaries require special care when they are moulting. They should be kept in an even temperature, and for this reason the cage should be hung in a fairly warm room during winter, and well covered up at night. The bath need not be altered in any way, but it is often beneficial to add to the water some iron in the form of citrate. See Canary; Parrot; Pigeon; Poultry.

MOUNTAIN ASH. A summer-leaving tree, with ornamental foliage, flowers and berries, the mountain ash (*Pyrus aucuparia*) is particularly suited for culture in suburban gardens, as it will flourish in a smoky atmosphere. Its usual height is about 15 ft. to 20 ft. It may be increased by seed. The white flowers are borne in May and June, and are followed in the autumn by deep orange or scarlet berries.

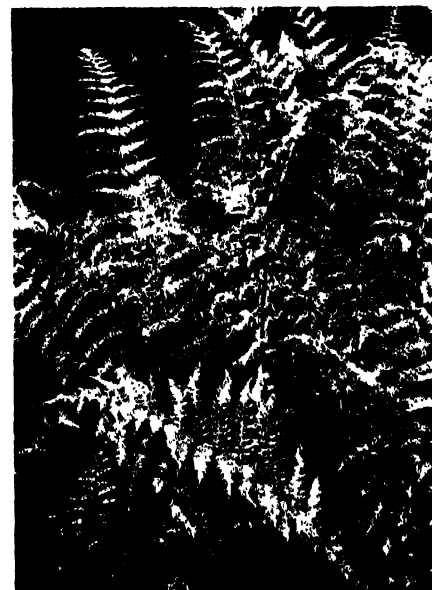
MOUNTAIN AVENS. A family of hardy evergreen trailing rock garden plants, of which the species *Dryas octopetala*, a native plant of great beauty, is found on the mountains of various parts of the United Kingdom. The flowers have eight petals, are about 1 in. in diameter, and are white, with conspicuous yellow stems. *Dryas Drummondii* has yellow flowers; both bloom in summer.

Propagation is by division in spring, or by seeds sown in the spring when available. They flourish in a moist, peaty soil, and should be planted in autumn or spring.

MOUNTAIN BLADDER FERN. The common name of *Cystopteris*, a genus of beautiful hardy ferns which flourish in a compost of loam, leaf mould, sand and mortar rubble in a shady part of the rock garden. *Fragilis* and *montana* are two favourite sorts of the fern.

MOUNTAIN BUCKLER FERN. This is a species of *Nephrodium*, a genus of easily cultivated and strong-growing ferns which embraces the common maid fern. It is useful for odd shady corners or exposed portions of a fernery where choicer kinds would fail. Ordinary soil with which leaf-mould has been mixed is suitable. See Fern; Garden.

MOUNTAIN CLEMATIS. This is a beautiful climbing plant (*Clematis montana*) bearing white flowers in May; it grows very quickly and is ideal for trellises and pergolas, as well as for covering porches and the fronts of houses. *Clematis montana rubens* has rose-red flowers. See Clematis.

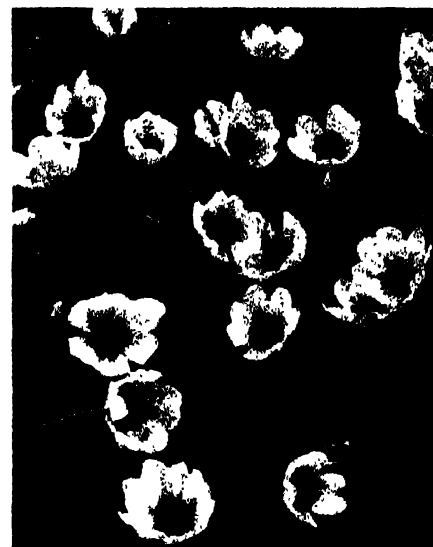


Mountain Buckler Fern. An easily cultivated fern which grows to a height between one and two feet. It is useful for odd corners where a more delicate variety would fail. See above.

MOUNTAIN SPINACH. The mountain spinach, or *Atriplex hortensis*, is raised from seed like the ordinary spinach. The leaves are cut, cooked, and eaten as spinach. A red-leaved variety is sometimes grown in the flower garden for the sake of its colour in summer. See Garden; Spinach.

MOUNTING: Of Pictures. Photographs and pictures are usually improved by careful mounting, the mount consisting of a sheet or frame of paper or cardboard, of white or that colour which most heightens the effect of the picture. It may vary in size from one very little larger than the picture to one several times its size. Occasionally, when used simply for stiffening, it is of the same size.

Photographs, prints, etchings, pencil and black-and-white drawings, etc., and also small lightly-tinted water-colours look well when fixed before a solid mount. Mounts of larger and heavier pictures should be in the form of



Mountain Avena. Delicate flowers of an evergreen trailing plant resembling those of the anemone.

frames of cardboard with bevelled edges. Such mounts are not infrequently a part of the frame, in which case they may slope slightly back from frame to picture. By means of a mount an oval, round, or oblong picture can be inserted in a square frame. Oil pictures rarely require mount.

The size, shape, and colour of the mount depend entirely upon the picture, and can only be decided by individual judgement. The picture need not necessarily be placed in the centre of the mount; it may be nearer the top than the bottom, though not vice versa. It is well to note, also, that a bold or darkly-coloured picture will be enhanced by a dark or dull-coloured mount, while a picture in pencil or delicately tinted will be killed by a dark one. The mount should never be bright in colour.

Cutting the Mounts. Mount-cutting is simple work, and requires but a few tools. Although a penknife may be used, the best results are obtained with a mount-cutter's knife, as illustrated in Fig. 1 on page 824. In addition a steel straight edge with one edge bevelled, a 2 ft. rule, a pair of compasses with a pencil point, and a tee square, are necessary. First cut the mount to fit the frame, and then mark the amount of opening required. There are two methods of doing this; either rule the lines very faintly on the mount or place the picture in position on top of the mount, and then prick the corners carefully with a pin.

To cut out a square or rectangular mount as shown somewhat exaggerated in Fig. 2, place the straight edge a little way from the

line or points grasp the handle of the knife firmly in the right hand, and with the left pressing on the straight edge make a complete slanting cut along the line as in Fig 3. Repeat this on the three sides, and if necessary ease the corners so that they come away clean. The picture is fastened to the back with a little fish glue smeared on the extreme edge, or it may be secured by pasting narrow strips on the back of the picture and mount.

It is essential to the appearance of a cut-out mount that the mitre cut at the corners should be clean. The long cuts should be made in one stroke, and this is not difficult with thin mounts, but in cutting thick cardboard the knife must be very sharp, and it must go through the materials, as two attempts will spoil the effect. The cutting of round and elliptical openings must be done freehand. It is not possible to have a stock of shapes to suit all openings, but with practice in straight cutting without a straight edge it will not be found difficult to round corners and follow curves. Mounting boards, which are obtained from dealers in artist's materials, are supplied in thicknesses known as 4, 6, 8, 10, and 12 sheet, and in sizes from quarter royal, 11½ in. by 9½ in., to antiquarian, 33 in. by 35 in.

Gilt mounts are often used for water colours, and although the cut edges will be white, they can be gilded by using gold leaf. Brush the back of the leaf with gold size, both being obtainable from an artist's colourman, and when dry cut into strips a little wider than the bevelled cut. Moisten the size with a camel hair brush dipped in water, and place the strips on the bevel with the top edge true with the surface. Press gently with a soft rag, and when all the edges are covered turn the mount over and press the projecting edges of the leaf on the back and give a final rub with the rag. See *Passé Partout*; *Picture Framing*.

MOUNTING: Of Photographs. When an adhesive is to be applied to the whole of the back of a print, for mounting it on a card or heavy paper, it should contain a minimum of moisture, and be used very sparingly to avoid cocking of print or mount. The best adhesive for this purpose is that sold as photo mountant, of which dextrine is the principal component.

A similar paste mountant can quite easily be made at home as follows: Mix ½ lb. of the best white dextrine (the best quality only should be used) with cold water to make a smooth creamy paste, taking small quantities of dextrine with a very little water and adding further dextrine and water as required. When the paste is thoroughly mixed, stir in 20 or 30 drops of oil of cloves or cinnamon and 5 oz. of water.

Boil in a clean saucepan until clear. Set it aside in a straight-mouthed jar, such as the white jars used for holding marmalade, to cool, and keep it covered. These mountants are very economical in use, and a small quantity on the tip of the finger or brush need

only be used, rubbing it well into the back of the print. Other mountants are made of paste and arrowroot.

To mount a photograph or print it should

first be made properly flat and be trimmed square. Non-photographic prints are sometimes best flattened by damping slightly on the back; but care should be taken to see that the print is not damaged, and in the case of old and valuable prints it is better to avoid damping.

If the mount of a photograph is to show when framed it should be chosen to harmonize, rather than to contrast, with the colour of the photograph. Probably the best mount is a good white card or stiff paper. Only good quality card or paper should be used, as the cheaper kinds are not really white and have a tendency to yellow within a comparatively short time.

If photographs or prints are not to be mounted close up, i.e. the mount is to show, the print should be arranged so that it is exactly central on the mount but with more margin below it than above. If the margin is equal top and bottom as well as both sides it will give the appearance of being mounted too low. The best rule is to have the margins at top and sides equal, and the bottom margin half as deep again. The place to be occupied by the print on the mount should be measured out and marked at each corner with pencil dots. A little mounting paste is then rubbed into the surface of the mount and the whole of the back of the print is treated with mountant.

The print is placed immediately in position on the mount and pressure applied by rubbing all over with a clean rag or handkerchief. A roller squeegee may be used instead if clean paper is interposed between the photograph and the roller. As soon as it is seen that the print adheres all over, it is put away under pressure.

For photographs or prints that are to be mounted in portfolios or albums, or framed up by *passé-partout* method, it is sufficient to mount them by the corners or edges with gum or secotine.

The most effective and permanent method of mounting photographs and prints, and one in which there is no risk of damaging the print, is that described in the article *Dry Mounting*. In any mountant that is used, particularly in the case of photographs, it is essential that no acid should be present, since this will almost certainly cause stains and spots to appear on the face of the print after a little while. See *Dry Mounting*; *Passé Partout*; *Paste*; *Photography*; *Picture Framing*.

MOUERNING. The conventions governing the wearing of mourning have been greatly relaxed, and the mourners themselves usually decide how long they will wear black, and to what extent it shall be unrelieved. Heavy crape is now seldom worn, but no hard and fast rule can be laid down in these matters. Purple in all its shades, black and white mixtures, and greys are considered as half mourning.

For a very neat relation, i.e. for a parent, it is usual to wear mourning for a year, and it is quite permissible to wear white collars, furs or scarves to relieve the black. Mourning is worn at a funeral by persons attending as a mark of respect, even if they are not closely related.

Mourning for men is simpler than for women. It is usually considered sufficient if a man wears a black tie and a black band on his left arm. At a funeral the ordinary black morning coat with dark striped trousers is the correct wear. See *Crape*; *Funeral*.

Mouse. See *Mice*.

MOUSE-EAR CHICKWEED. This rampant perennial creeping plant is suitable for rockeries or edgings to borders. It should be planted in autumn or spring. The flowers are white and the leaves silvery green. *Cerastium tomentosum* and *C. Biebersteinii* are the chief kinds. They spread very quickly and are easily propagated by detaching rooted pieces.

MOUSSE: How to Make. Literally mousse means something of a light, mossy texture. In cookery it is either a very delicate steamed pudding, a meat dish made with cream and gelatine, or a kind of ice pudding, packed into a mould or case and immersed in ice or placed in an ice cave without the contents having been frozen in a cylinder or freezer. The mousse is sometimes served in pyramidal form, but more often turned out of a plum mould whole, when made as an ice pudding; but it is the texture which is most important, and this should always be spongy.

To make the steamed mousse, cream together 2 oz. butter or margarine with 2 table-spoonfuls pounded lump sugar. Add the yolks of 4 eggs and vanilla or some delicate flavouring. Whisk over hot water until the custard thickens, then fold in the whites of the eggs, beaten to a stiff froth. Turn the whole into a plain soufflé mould, prepared by being greased with olive oil and lightly floured, and steam it



Mouse-ear Chickweed. White flowers and silvery leaves of a plant suitable for edging. See above

in the oven for 35 min. To steam it, place the mould into a pan three-parts filled with boiling water. The mould and the pan must be covered. Serve the mousse with a mustard sauce.

To make an iced mousse, beat up over hot water ½ pint syrup with 6 yolks and 1 whole egg until the mixture is thick enough to coat a spoon; it should resemble a sponge. Remove it from the heat and continue beating until it is cold. Add any flavouring desired, sugar, a wineglassful of liqueur, and ½ pint whipped cream. Turn it into the mould, and plunge into ice and salt, making sure that no ice can penetrate it. As the mixture is very light, it requires careful handling when being turned out.

Chicken and ham mousse is a favourite buffet dish for parties. The ingredients

required are 4 breakfasts cold chicken and ham, $\frac{1}{2}$ pint chicken stock, $\frac{1}{2}$ oz. gelatine, 1 gill cream, and seasoning. The meat is finely minced and pounded in a mortar or rubbed through a sieve. Dissolve the gelatine in a little stock and add it with the rest of the stock to the meat. Season with pepper, salt and a squeeze of lemon juice. Whip the cream stiffly and fold into the mixture. Put in a mould to set. Garnish with chopped parsley and serve with salad. A recipe for a chicken mousse which is suitable for invalids is given in page 234. See Chicken; Ice; Mould.

MOUSSELINE. The usual French form of the English word muslin is applied especially to mousselines de sole, or silk muslins, which are thin, light, and usually coloured silks. Mousseline de laine, or wool muslin, is also known as delaine.

MOUTHWASH. The following are useful mixtures for cleansing the mouth and preserving the teeth. A teaspoonful of the first is diluted in half tumbler of water.

Thynol	1 part
Benzolic acid	10 parts
Oil of eucalyptus	10 "
Oil of peppermint	2 "
Rectified spirit	200 "
Carbolic acid	15 minim-
Bicarbonate of soda	2 drams
Glycerin	1 oz.
Rose water to make	8 oz.

A third mouthwash is composed of compound solution of tannin and BPC mixed with 3 or 4 parts of water. See Teeth.

MUCOUS MEMBRANE. The membrane which lines the mouth, nose, respiratory passages, gullet, stomach, intestine, etc., is called a mucous membrane, and it always secretes mucus, a viscid and tenacious fluid. Its structure varies greatly in different parts. A cold in the head is inflammation of the mucous membrane of the nose chambers caused by microbes.

MUFFIN: How to Bake. A kind of light yeast dough is made up into flat cakes, called muffins, and baked on a muffin plate or griddle. Sift into a basin $1\frac{1}{2}$ lb fine flour, adding 1 teaspoonful salt. Cream 1 oz. dried yeast with $\frac{1}{2}$ oz. castor sugar until it liquefies, then mix in very smoothly 1 pint warm milk. Make a well in the centre of the flour, pour in the liquid, and work in sufficient flour to make a batter. Cover the basin with a clean thick cloth and stand it to rise in a warm place.

Rub 1 oz. margarine in 2 oz. flour till quite fine, then beat in by degrees $\frac{1}{2}$ pint warm milk; stir this into the risen batter and beat all together well; $\frac{1}{2}$ hour is not too long. Now add sufficient flour to make a soft dough—very little may be required. Set it to rise again until it is very light and spongy. Make it up into round flat cakes, and bake them on a griddle greased lightly with mutton fat, turning each cake over as it begins to colour. A little extra flour may be needed when making the muffins in order to mould them.

Muffins should be toasted gradually or they are inclined to become heavy. Warm the muffin and nearly part it before beginning to toast it. Then toast each outer side, pull them apart, butter the inside of each half, set one on the top of the other, and keep very hot while dealing in like manner with the remainder. Muffins must not be cut with a knife, but should be pulled with the fingers. A proper bright bakestone is made for baking muffins, but a thick griddle makes a good substitute.

MUFFINEER. This word is used for a pepper castor greatly valued by collectors. They were first made in England about 1700, the early ones being shaped in the form of a cylinder with a domed or curved top, and with a lid that can be taken off. A little later the more graceful, vase-shaped article was introduced into the country. Muffineers are found

both in silver and Sheffield plate and in a great variety of shapes. Some are plain, but others are decorated, piercing being a form of ornamentation used on them. Some are part of a set that includes salt cellars and a mustard pot, and a few have glass liners inside. The perforations for the pepper are often artistically done.

Small muffineers are sometimes filled with salt and placed on the afternoon tea table. They thus serve the purpose of seasoning muffins or crumpets. See Pepper Pot, Sifter, Silver

MUFFLE. In a particular type of furnace the heat from the fire is made to pass around an inner or oven-like member. This is termed a muffle furnace, and a small one may be used by the home worker. The muffle furnace is employed in the enamelling of jewelry, and also in the heating of tools for hardening. See Enamelling, Furnace.

MUFFLED GLASS. This term is used for a particular type of glass, the characteristics of which are similar to sheet glass. It is blown into cylinders in a similar fashion, but is distinguished by a surface ripple, which is more marked on one side of the sheet than on the other, and varies considerably. It possesses considerable brilliancy, and is sometimes used for leaded light work. Muffled glass takes its name from the fact that the cylinders in which it is made are generally known as muffs.

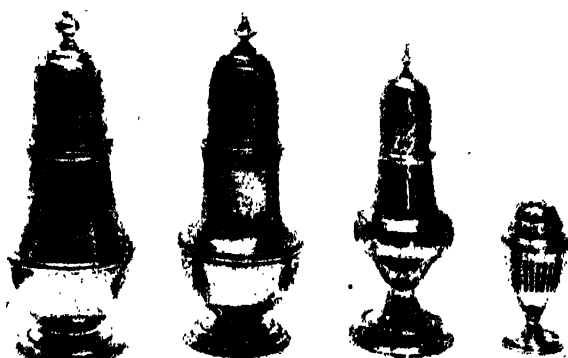
MUFFLER: How to Knit. This article, strictly speaking, is a square of silk or other material measuring about 30 or 40 in., used for tying round the neck. The word is, however, chiefly used for a scarf worn as a protection against the cold and may be woven or knitted of silk or wool.

A knitted muffler is very simple to make, and can be easily adapted to college or club colours, or striped with two other shades or colours. The amounts of wool used are given below, so that the corresponding quantities can be obtained in any colours desired.

For a muffler measuring 41 in. long by 9 in. wide the following quantities of 4-ply Beehive Scotch fingering will be required: 4 oz. in the main colour, 1 oz. for wide dark stripes, and $\frac{1}{2}$ oz. of a lighter shade for the narrow stripes. Use No. 9 bone knitting needles for a fairly close stitch at a tension of 7 stitches to the $\frac{1}{2}$ in. width. The pattern is moss stitch, which is compact and very suitable. It consists of knit one stitch and purl one stitch alternately to the end of the row, then as an even number of stitches is cast on, the second row will begin with purl 1, then knit 1, and repeat alternately to the end of the row. For this width cast on 70 stitches and pro-



Muffin. Plate of the favourite tea cakes ready for toasting, splitting and buttering



Muffineer. Four beautiful examples in silver or old-fashioned pepper pots. All belong to the Georgian period, dating from 1716 to 1792. Courtesy of Chappell & Mantell

ceed in the moss stitch, changing the colours as follows: Work 3 in. in the main colour, then $\frac{1}{2}$ in. in the light, 2 in. in dark, $\frac{1}{2}$ in. in light. Now work 30 in. in the main colour, and work off the following end in colours to correspond with the first end of the muffler. Always change the colours on the same side of the knitting, and when changing to the new colour cut off the old, leaving a few inches hanging, and knit it in with the new, doing one stitch with the first colour and the next stitch with the second colour alternately until the old end is knitted in. At the end cast off fairly loosely so that one end is not contracted any more than the cast-on edge. See Knitting, Scarf.

MUG. The mug is an old form of drinking vessel, still used by children and in public-houses. It is really a small edition of the tankard. Mugs are mostly made of the cheaper kinds of earthenware for children with the exception of silver christening mugs. They are also made of silver and Sheffield plate. The silver mugs sought by collectors sometimes date back as far as the late 17th century. See Pewter; Silver, Tankard.



Mug. Silver mug, barrel-shaped, with engraved lines, 1795. Courtesy of Chappell & Mantell

MULBERRY. The mulberry tree is valuable for its appearance, its flowers and its fruit. The black mulberry, *Morus nigra*, may be grown anywhere in light, deep loam. It should be planted in autumn. In addition, the white mulberry and the red mulberry are well known. All these have heart-shaped leaves with toothed edges, and inconspicuous, greenish-white unisexual flowers, produced in spikes and wind-fertilized. The tree takes some time to establish itself and is slow growing.

The method of propagation is by cuttings, or even by pieces of the branches broken off and stuck in deep, moist soil in the autumn, or seeds may be sown in sandy soil in the greenhouse in spring.

The leaves of the mulberry are the best food for silkworms. For this purpose the white mulberry is particularly grown in China and elsewhere. To feed home-grown silkworms, however, the leaves of the excellent fruit-producing black mulberry will be found equally efficacious.

The fruit, which resembles that of a large raspberry or blackberry in appearance, should not be gathered until it is ready to drop. As a matter of fact, it usually drops unexpectedly before it is gathered, and therefore the mulberry should always be planted as a lawn



Mulberry. Rich fruit somewhat resembling that of the raspberry or blackberry, excellent for dessert.

tree; where this is done the fruit can then drop un injured into the grass.

How to Cook. Mulberries may be eaten as dessert, preserved by bottling, made into wine or jam or a flavouring syrup, and also included in fruit compotes, salads, and ices. They can be cooked in the same way as raspberries, and are particularly good when stewed in syrup and served with custard or cream, or made into pies and tarts.

Mulberry Cream. This is prepared by stalks 1 pint mulberries, putting them into a pan with $\frac{1}{2}$ lb. sugar and the juice of a lemon, and cooking them gently until they are tender. When cold, put the fruit into a glass dish and pile on top of it $\frac{1}{2}$ pint cream and the whites of two eggs whipped separately, then stirred lightly together, sweetened to taste, and flavoured with vanilla. A cheaper dish can be made by covering the fruit with custard and just before serving adding a meringue of whites of eggs and castor sugar. (See Meringue.)

Mulberry Jam. To make mulberry jam put 2 lb. stalked and rather unripe mulberries into an enamel pan with $\frac{1}{2}$ pint water, stew them gently until they are soft and then add $1\frac{1}{2}$ lb. preserving sugar and the grated rind and strained juice of a lemon. Bring all these to the boil over a low fire, stirring all the time, and continue boiling until the jam will set when tested on a cold plate. Take off any scum that rises, then pour the jam into pots and tie them down. This will make only a small amount of jam.

Mulberry Wine. To make this drink, pour 1 gallon boiling water over 2 lb. mulberries, let them stand for 24 hours and then

strain off the liquor, pressing the fruit against the side of the vessel to extract the juice. Measure the latter and put it into a preserving pan, with $\frac{1}{2}$ oz. ground ginger, a clove, and sugar in the proportion of 2 lb. to every gallon of liquor. Boil the whole gently for about an hour, skimming it whenever necessary; let it cool to about 98° F. and stir in $\frac{1}{2}$ teaspoonful of brewer's yeast. Pour the wine into a cask, cover the bung with a cloth, and let it stand for two weeks; then add $\frac{1}{2}$ pint brandy, and cork tightly. The wine will be ready for use in about six months.

MULBERRY BUSH: The Game. This is one of the most familiar of the singing games. All the players join hands in a ring, and dance round and round singing:

Here we go round the mulberry bush, the mulberry bush, the mulberry bush;

Here we go round the mulberry bush on a cold and frosty morning.

This serves as an introduction, and is sung to the same tune as "Here we go gathering nuts in May." The next movement is for the children to drop hands and sing: "This is the way we wash our hands," repeating it in the same fashion as before, with appropriate gestures, and ending with the same refrain. "This is the way we go to school" shows the children crawling round with drooping heads and depressed faces, while "This is the way we come home from school" is the signal for them to skip round.

Hair brushing, putting on shoes, going for walks, learning to dance, and a host of other movements may be introduced, and before each the opening verse must be sung, during which the players join hands again and dance round in a circle.

MULCHING. This term is applied in gardening to the act of spreading a layer of some protecting material upon the ground above the roots of plants to preserve them from frost or drought. The mulch generally consists of well-rotted stable manure, tan, coconut fibre, and decaying leaves or the leaves of fern or of bracken. See Top Dressing.

MULLEIN. This is a hardy biennial or perennial of great decorative value in the garden. Most of them are vigorous leafy plants with tall spikes of bloom in summer. The best perennials are *Chaixii*, yellow, 3 ft.; *nigrum*, yellow, 2-3 ft.; *densiflorum*, yellow, 3 ft.; and *phoeniceum*, various colours, 2 ft. Of the biennials (those which bloom the year following seed-sowing and then perish) one of the best is *olympicum*, yellow, 4 to 5 ft. Many beautiful cross-bred varieties have been raised. Two of the best are *Cotswold Queen*, salmon-bronze, and *Gainborough*, yellow. The mulleins thrive in ordinary soil and may be planted in autumn. The perennials can be increased by division at these seasons; biennials are raised from seeds sown in May.

Mullet. This is a general name for two different fish, both of which are good eating. See Fish; Grey Mullet; Red Mullet.

MULLING. Heating, sweetening and seasoning wine or other liquor with spices is called mulling. Wine can be mullied by heating it to a certain temperature and then adding to it some sugar and also a little nutmeg.

Mulled Ale. The following is a good recipe for mulled ale: Put $\frac{1}{2}$ pint ale, a little ginger, a clove, a small piece of butter and teaspoonful sugar into a saucepan and bring to boiling-point. Beat up 2 eggs with a tablespoonful cold ale, pour the boiling ale into them and then into a large jug. Pour the contents rapidly from one large jug to another for some minutes; then return the liquor to the saucepan and heat it again to nearly boiling point. Serve the ale very hot.

MULLION WINDOW. This is a window in which the upright divisions are built in the window frame, and generally form a part of the structure of the building, the mullion being more or less in the nature of a post or support for the lintel. The type is particularly applicable to constructions in stone. See Window.

MUMPS: The Treatment. The chief characteristic of mumps is the swelling of the salivary glands, the disease, which is highly contagious, being communicated by the breath and saliva of the patient. The incubation period is from 2 to 3 weeks, the quarantine period is 25 days.

Languor and feverishness are amongst the earliest symptoms with pain in the glands, especially near the angle of the jaw, and swelling of the parotid gland near the lobe of the ear. The breath becomes offensive, and there is an increased flow of saliva.

The patient should be kept in bed for a week or 10 days and in his room for another week.



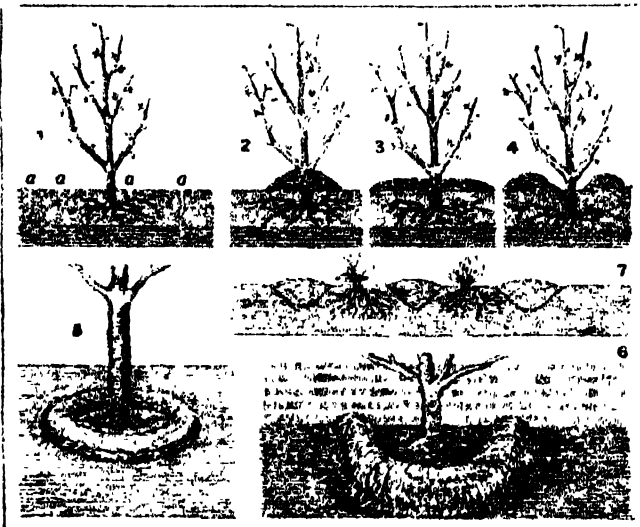
Mullein. Yellow umbels of a vigorous hardy plant.

He should have a fluid diet. A warm poultice or a pad of cotton wool should be applied to the swollen face. The mouth must be frequently rinsed with warm water containing a little permanganate of potash. When the patient leaves the sick-room, the bedding, carpet, and everything in the room should be thoroughly disinfected.

MUNTIN. This is the name given to that portion of a door framing which forms the centre uprights between the middle and top and bottom rails. It is tenoned into them, and is used in all panelled doors, and in other cases where the width of doors or the framework of panelling is divided into two or more panels. See Door.

MURIATE OF POTASH. Used as a fertiliser, muriate of potash, which is a mineral salt containing about 48 per cent of pure potash, is very soluble and is readily absorbed by plants. The sulphate of potash is more generally accepted as a plant food, mixing well with other components and giving good results. Muriate should not be used in larger quantities than 4 lb. to the square rod.

MUSA. The musa, or banana, is a hot-house family of vigorous, large-leaved perennial plants. The height is from 4 ft. to 10 ft. Musas are best started in pots or tubs in early spring, in a mixture of loam and sand. The plants should be well watered and syringed



Mulching. 1. Need for mulching: a, cracked dry soil. 2 and 3. Wrong ways of mulching bushes. 4. Correct method. 5. How to mulch a standard. 6. How to mulch a wall tree. 7. Good method of mulching plants.



Musa. Leaves and fruit of the large hothouse plant, better known as the banana

frequently. Musa esculenta is chiefly used for decorative purposes, in sunken pots or tubs in the sub-tropical garden. It may be safely placed out of doors in June and taken in again in September. If the plants are grown under glass to yield fruit Musa cavendishiana is recommended.

MUSCADEL. The name of muscadel is given to strong French and Italian wines, both white and red, such as the Lacryma Christi (q.v.) of Naples. See Wine.

MUSCAT. The name is given to one of the most highly esteemed grapes in cultivation. One of its most deliciously flavoured varieties, Muscat of Alexandria, was introduced from the East some two centuries ago, and from its small berries are obtained the sultanas of commerce. Other good muscats are Mrs. Pince, Lady Hastings, and Prince of Wales. Under proper cultivation muscats bear long, tapering bunches of sweet, rich, fleshy berries, but they require a high temperature. See Dessert; Grape; Vine.

MUSCATEL. Muscates are a variety of sun-dried raisin that is appreciated as a dessert dish. The muscates are large and juicy, of a purplish colour and are usually served piled on a dessert dish, the raisins being retained on their branches. Shelled almonds are served with muscates.

Muscate Pudding. A baked fruit pudding is made with muscates by mixing 1 lb. self-raising flour with $\frac{1}{2}$ lb. finely chopped suet, $\frac{1}{4}$ lb. sugar, $\frac{3}{4}$ lb. stoned muscates, $\frac{1}{4}$ lb. candied peel cut into small pieces, and a little grated nutmeg; to these add a beaten egg previously mixed with $\frac{1}{2}$ pint milk and water used in equal proportions. Beat the whole well, and then pour it into a greased pie dish. Bake the pudding in a moderately hot oven for 1½ hours. This is sufficient for about 8 persons. See Dessert; Raisin.

MUSCLE. Muscles are of various shapes. Some, like the biceps, are rather spindle-shaped; others, like the sartorius, form long, narrow ribbons, and others still, like those in the anterior abdominal wall, form broad, thin sheets. A muscle is enclosed in a sheath, and is found to be made up of bundles of fibre, separated by connective tissue.

Muscle possesses irritability; that is, it responds to some kind of irritation. Normally, the excitation is nervous energy, but an electric current, the striking of a muscle, and other causes will also evoke a response.

This takes the form of contraction; a muscle fibre, and therefore the whole muscle, becomes shorter and thicker in response to the excitation.

Muscles perform a large volume of work. They are enabled to do this by the oxidation, or combustion, of sugar supplied to them by the blood, of which they receive a generous supply. But just as the combustion of fuel may not only supply energy for an engine, but also heat, so the combustion of sugar in a muscle liberates heat, so that blood coming from a muscle is hotter than that which goes into it. This, in fact, is the chief source of the heat of the body, and explains why a person who is cold desires to move about.

Fatigue supervenes sooner or later when a muscle is being continuously exercised, and is due rather to the accumulation of waste products and, notably, lactic acid, than to the using up of available fuel. Massage, by improving the circulation through a muscle and washing out this acid, helps to remove the sense of fatigue.

Injuries and Diseases. Overstretching of a muscle is described as a strain. There is pain and stiffness. The muscle should be rested and, if necessary, hot or cold applications will relieve pain. Early massage and gentle

movements are necessary. A muscle may be ruptured by violent stretching when it is contracted or by a blow when it is in this condition. The severed fibres contract and leave a gap which is more evident if an effort is made to move the muscle, the severed ends gathering into knots. The limb should be placed in such a position as to put the muscle at rest and shorten it as much as possible.

Inflammation of a muscle, or myositis, may be due to one of the causes of inflammation (q.v.) in any situation, and if this cause be a microbe an abscess may result. The general symptoms and treatment of these conditions are described under their respective headings. Muscular rheumatism is inflammation in the connective tissue mingled throughout a muscle—a fibrositis.

A painful spasm of a muscle is usually referred to as cramp. Pain in a muscle without obvious signs of inflammation is spoken of as myalgia; it is generally due to rheumatism. An intensive use of muscles leads to an increase in their size, or hypertrophy. Disease, on the other hand, causes a diminution in size, or atrophy. There may be a progressive muscular atrophy involving all parts of the body. See Backache; Cramp; Fibrositis; Lumbago; Rheumatism; Sprain.

MUSHROOMS: GROWING AND COOKING

Advice About an Appetizing and Nutritious Food

This article describes in detail various ways in which mushrooms can be grown, afterwards dealing with methods of cooking them. See Frame; Hotbed; Manure; Savoury, etc.

Rich in nitrogenous matter and easily digested, the mushroom is a highly nutritious fungus which grows luxuriantly and very rapidly in warm, showery weather. The utmost care, however, is necessary in detecting the nature of the fungus, as the non-edible variety, which is poisonous, is similar in appearance to the edible fungus.

The edible mushroom has a dry pleasant smell, its flesh is dry and brittle and the outer skin peels off easily. Deaths occur annually through the eating of poisonous fungi, under the impression that they are mushrooms.

Testing Mushrooms. To test mushrooms, sprinkle a little salt on the spongy part and leave it for a few minutes. If the flesh turns yellow, the fungus is poisonous; if it turns black it is wholesome. Another test is to use a silver spoon while cooking the mushrooms. The silver will be blackened if any injurious property is present. When poisonous mushrooms are eaten, if the effects come on quickly the early symptoms are giddiness, dimness of sight, and weakness. If the poisonous effects are delayed, the symptoms are irritation, pain, vomiting and purging. An emetic of two tablespoonfuls of common salt in a glass of water should be given at once, and afterwards a dose of castor oil.

Hints on Growing.

In England mushrooms are generally gathered in the fields during the late summer months, and are most easily found in the early morning. They can, however, be cultivated, and in Bulletin 34 the Ministry of Agriculture give some information on this subject. If kept for any time after being gathered, mushrooms become unwholesome, and may become poisonous. Any portion that is not eaten should be thrown away, as there is some risk of the develop-

ment of poisonous properties if cooked mushrooms are kept for a day or so, or are served re-cooked. Intending growers of mushrooms will be well advised to buy spawn from a manufacturer of good repute. It is sold in the form of "bricks." Pure-culture spawn should be obtained.

The manure intended for the beds should be very carefully selected and prepared. Manure containing peat, sawdust, or chip litter, and that from horses under veterinary treatment, should be avoided. The manure should contain some straw litter. When the required quantity has been collected the longest straw should be shaken out with a fork and stacked in a dry place for use later in covering the finished bed. The rest of the manure should then be stacked in a heap. If very dry it should be watered.

The heap should now remain untouched for 3 or 4 days, during which time a considerable heat will develop. It should then be turned, care being taken to turn the outside portions into the centre of the new heap. If still dry a little more water should be added and the heap left to heat up again for a further 2 or 3 days and again turned as before. If the dung is good and not too old, no further turning should be necessary. When



Mushroom. Plate of the nutritious edible fungus which can be grown from spawn in a cellar or shed, and cooked in many attractive ways

opened up it should be hot and steaming, moist but not wet, and should smell strongly of ammonia. If in this condition it is ready for making into beds. Where possible the manure should be prepared under cover but in open sheds. If prepared in the open the heap should be protected from heavy rains.

For indoor culture almost any place can be used providing an equable temperature of about 50° can be maintained. Indoor beds, except in glasshouses, may be made at any time. The beginner should not, however, attempt to make beds during the months of May, June, and July, as the higher atmospheric temperature during these months necessitates considerable judgement in the use of water in the preparation of the manure and beds. Outdoor beds are usually made up in late summer.

Beds for Mushrooms. The most common types of beds are flat and ridge. For indoor culture where space is limited, flat beds are chiefly used. The size of the bed will depend upon the weight of manure available, one ton making 6 sq. yd. of bed 9 in. deep. Where artificial heat is available a depth of 6 in. may be sufficient, but where there is a possibility of low temperature, the bed may be made as deep as 15 in. to 12 in., however, is the common range of depth. Before commencing to lay the bed, the site which it is to occupy should be carefully cleaned and dusted over with slaked lime.

The site should then be carefully marked out, and the manure spread evenly to a depth of 10 in., beating it down with a fork as the spreading proceeds. It should now be trodden down compactly. This will reduce the depth to about 6 or 7 in.

The successful construction of a ridge bed requires considerable experience. The usual ridge bed is, in section, the shape of a triangle with the top cut off, 2 ft. 6 in. along the base, 2 ft. 6 in. high, and 6 in. along the top. The length will depend upon the amount of manure and space available. 1 ton of manure usually making 2½ yd. of bed. When the base has been accurately marked out, the manure should be carefully and evenly spread the whole length to a depth of 18 in. and brinsly trodden down. A further 18 in. should then be added and trodden down in a like manner.

The bed should now be 2 ft. high of tightly packed manure with a lot of loose overhanging material on the sides. This should be removed

with a fork and placed on the top bringing the height up to 3 ft. The top and sides should be thoroughly beaten until perfectly compact, smooth and even, any loose material being swept up and set aside for use in the next bed. To prevent evaporation, the beds should be lightly covered with the long litter previously shaken, and protection from rain should be provided for all outdoor beds.

If the processes described have been properly carried out, the temperature of the beds should now commence to rise, and to follow the progress of the heating a thermometer should be inserted in the bed, the bulb being at least 3 in. deep. Special thermometers tending up to 160° to 200° F., protected by a wood or metal case.

When the temperature at 3 in. below the surface has steadily dropped to 85° F. for flat, and 80° F. for ridge beds, the beds are ready for spawning. There is much difference of opinion as to the correct temperature for spawning, but as the spawn is only inserted on the surface there is no risk of it being killed unless the inside heat again rises above 85° F. If the temperature is allowed to drop to 75° F. it is possible that the spawn will not develop or will develop very slowly and cause long delay in the production of mushrooms.

Inserting the Spawn

The bricks of spawn, if very dry and if the bed is also rather dry, should be dipped in water before use. Each brick should then be broken into 8 pieces, as nearly as possible of equal size. The pieces of spawn should be inserted in the bed in diagonal lines as nearly as possible 9 in. apart in all directions. Pure culture spawn is superior to the old-fashioned brick spawn, and is now used extensively. After spawning it is advisable to allow the beds to rest a few days before soiling or casing.

In casing a ridge bed it is best to begin to apply the soil to a height of 1 ft. and a thickness of about 2 in., beating it lightly with the smooth back of a spade to make it bind. This process is repeated another foot in height, leaving only the top and a small portion on each side to be completed in a similar manner.

The casing of a flat bed is a comparatively simple matter, but care should be taken to see that the soil is uniform in thickness and firmly beaten down. The bed should now be covered to a depth of 12 in. to 18 in., according to the atmospheric temperature, with the straw litter shaken out in preparing the manure, supplemented if necessary, with new straw. Outdoor beds in cold weather will need straw mats or hurdles in addition. In frosty weather a little artificial heat will be needed in vineries or other glasshouses and in unprotected sheds. In normal circumstances mushrooms will begin to appear in six to eight weeks.

Mushrooms will thrive best in a damp atmosphere, and the beds should, therefore, be watered until damp but not wet. If the casing of soil becomes dry, it should be very lightly watered with a fine hose, going over the bed several times if necessary. On beds in unheated sheds the water used in cold weather should be

lukewarm. Watering, if properly done, should not be required more than once a week.

In normal circumstances the bed will need picking over three times a week, but in cold weather the progress of the crop will indicate how often picking is required. The bed should be uncovered piece by piece, each portion being covered again as soon as the mushrooms have been picked. They should not be cut, but carefully pulled, bringing away a little soil with the root-like threads of mycelium. The ends are now cut off into a refuse basket and the mushrooms freed from any soil, placed stem upwards in the basket. The holes made by pulling should be filled with new soil.

How to Cook. Mushrooms can be cooked in many ways and combined with other foods. They are also used in sauces and ketchups, while button mushrooms are excellent pickled. The recipe for mushroom ketchup is given in page 645.

To prepare stewed mushrooms, rub off the outside skin with a flannel dipped in salt and put them into a stewpan with 2 oz. melted butter or margarine. Add 1 teaspoonful salt and half the quantity of pepper, and stew gently until tender. Serve on a hot dish. Stewed mushrooms can also be served on toast. Stew as above, but add 1 teaspoonful grated lemon rind and a blade of mace. Add a white roux made from a dessertspoonful of flour stirred into a tablespoonful of melted butter or margarine. Stir this into the mushrooms, and serve them on fried bread or buttered toast.

Creamed mushrooms make a good entrée. Trim and rub with a flannel dipped in salt ½ pint button mushrooms. Melt 2 oz. butter or margarine in a pan, and stir in 1 teaspoonful flour; add the mushrooms, 1 tablespoonful chopped parsley, and ½ teaspoonful salt. Stir, cooking slowly, for about 10 min., then beat up the yolks of 2 eggs with 1 tablespoonful cream, and add this gradually to the mushrooms. Stir together for a few minutes, then serve the mushrooms in the sauce.

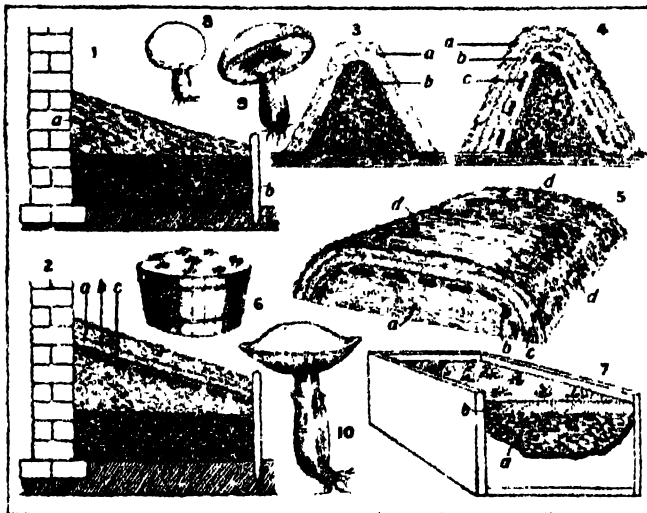
To grill mushrooms, cut away the stems and rub off the outside skin with a flannel dipped in salt. Grease the bars of the gridiron and place the mushrooms on the bars, sprinkling them with salt. Serve them, on buttered toast, or with bacon, etc.

Mushrooms and scrambled eggs are made by melting 2 oz. butter or margarine in a pan and simmering in it ¼ lb. mushrooms cut into small pieces. When they have cooked for about ¼ hour, add salt and pepper to taste, and when tender add 2 beaten eggs, and stir all together until the eggs are cooked. Serve the mixture on hot buttered toast.

To prepare croquettes or fritters made from mushrooms, peel and stalk ½ lb. mushrooms, put them into a saucepan with sufficient milk and water to cover them, and stew them for about ¼ hour, or until they are tender. Then strain off the stock, chop the mushrooms coarsely, and mix them with 1 teaspoonful boiled rice, 2 teaspoonfuls chopped parsley, and the same quantity of chopped onion. Melt ½ oz. butter or margarine in another pan, stir in ½ oz. flour, add the mushroom stock, and stir until it boils.

Put in the mushrooms, etc., and a beaten egg, and stir all over the heat until they are well mixed. Season the mixture carefully, turn it on to a plate to cool, and then shape into even-sized balls. Brush these over with egg, coat them with breadcrumbs, and fry them in smoking hot fat. When they are a golden brown colour drain them on kitchen paper, and serve them garnished with fried parsley and cut lemon.

Mushroom Patty. Mushroom patties are made by cutting up into dice and then stewing ½ lb. mushrooms, and stirring in about two



Mushroom Growing. 1. Outdoor bed against wall: *a*, top manure; *b*, well trod bottom manure. 2. Same with spawn in position: *a*, top straw; *b*, soil; *c*, spawn. 3. Outdoor mound: *a*, top manure; *b*, firmly packed manure. 4. Same completed: *a*, straw; *b*, soil; *c*, spawn. 5. Hotbed for collars: *a*, manure; *b*, spawn; *c*, soil; *d*, straw. 6. Tub culture. 7. Box culture: *a*, manure; *b*, soil. 8. Bottom. 9. Mature. 10. Old mushroom. The special arrangement with the mushroom growing.

tablespoonfuls white roux or plain white sauce. Line some patty tins with puff paste, and fill them with the mushroom mixture, placing a cover of pastry on the top. Bake them in a moderate oven for about half hour.

Mushroom Pickle Button mushrooms only should be used to make this pickle. Stalks, wash and dry them thoroughly, and then rub off the skins with salt. Put them into a pan at the side of the heat and let them cook slowly in the liquid which the salt draws out of them. Continue cooking until this liquid has been evaporated; then season the mushrooms to taste with mace and pepper, cover them with vinegar, and bring the whole to the boil. Boil it slowly for a few minutes, and let it cool slightly before pouring it into bottles or jars. When the pickle is cold tie it down, making the jar airtight.

MUSHROOM CAKES. Mushroom-shaped cakes coated with almond paste and chocolate butter icing, to give them a realistic appearance, can be made from a rich plain cake mixture baked in small cake tins for about 12 min., or until they are spongy.

When the cakes have cooled, level them to the required shape, and brush the sides and bottoms with white of egg. Cut the almond paste into rounds, stand a cake on each, and then mould the paste round it, leaving the tops uncovered. Trim off the rough edges, and place the cakes in a warm oven for 20 min., so that the paste may set. Then leave them to cool, and reserve any trimmings of almond paste for the stalks. Make the butter icing and ice the tops of the cakes by forcing the icing through a rose tube fixed to an icing bag. Start from the centre of the cakes and continue in straight lines to the edge where the



Mushroom Cakes, consisting of a plain cake mixture coated with almond paste and chocolate butter icing to give them a realistic appearance

almond paste begins. Mould the remainder of the latter into thick stalks, and stick one in the centre of each cake. See Almond Paste; Chocolate Roll; Icing; Madeira Cake.

MUSICAL CHAIRS. Musical chairs is an indoor game, the popularity of which is by no means confined to children. A line of chairs is placed down the centre of the room, there being one chair fewer than the number of players. They are arranged alternately, one chair being one way and the next the other. Somebody then plays the piano, and the players run round the line of chairs until the music suddenly stops, when each person sits down in the nearest chair. The player who fails to secure a seat is out of the game. A chair is then removed from one end of the line and the game continues with the recommencement of the music. It ends when only two people are left to circle round and round a single chair, the one who first occupies it when the music stops being the winner.

Where there are many players and not sufficient chairs available this game can be played equally well by putting a line of people instead of chairs, standing each with one hand on his hip, alternate left and right. The players have to put their arms through the arms of the improvised chairs when the music stops.

Musical bumps is popular with children. It is played in the same way as musical chairs, but when the music stops all the children sit down on the ground. The last one to do this is out of the game. See Children's Party.



Musk. One of the striking Monkey Flowers

MUSK The Plant. The favourite musk is *Mimulus moschatus*. Before it lost its scent this was a popular window plant, seen in almost every cottage window. The variety *Harrisoni* has larger flowers. Rooted pieces should be potted in March, several in a 5-in. pot in a compost of sand and leaf mould. *Mimulus moschatus* may also be grown out of doors. Other showy musks are luteus, yellow, and the numerous highly coloured hybrids which have been raised between luteus and guttatus. They are commonly known as monkey flowers. Seeds are sown in May to produce flowering plants the following year. Whitecroft Scarlet is a brilliant dwarf kind.

MUSK: The Perfume. One of the strongest of perfumes, musk is a dried glandular secretion obtained from the musk deer. Musk is very expensive, but it retains its odour for a long time, and for this reason is added to other perfumes in order to render them more durable. A cheaper substitute is synthetic musk, which is made from a coal tar product, toluene. See Scent.

Musk Mallow. This is a hardy herbaceous perennial plant, also called *Moschata*. See Malva.

MUSK ROSE. The popular name of *R. moschata* is musk rose. It is a very vigorous climber with clusters of white flowers. The leaves are greyish green. It should be planted in autumn and allowed plenty of room for development, for it makes rampant growth. See Rose.

MUSLIN. The successful employment of white muslin is a matter of skill and taste in adding colour touches in the form of a simple ribbon or in other ways. Muslin is again used for dressing table flounces over pale coloured satens, and cushion covers and curtains to match look dainty in a country bedroom.

Sprigged or embroidered muslins are pretty for summer curtains. Madras muslin and silk muslin are obtainable for this purpose in exquisite designs and colourings.

White muslin is easily tinted with the dyes and dolly-sticks used for curtains. In washing spotted muslin it is well to see whether the dots have actually been woven in or merely attached.

Plain muslins equally suitable for dresses, glass or long window curtains, bedspreads, and cushion covers are always procurable, and when they have served for one purpose they can frequently be turned to another. Muslins which have been soft can be stiffened by starching and ironing, and be used for foundations for other light stuffs. Spare muslin comes in for wrapping up food, making fly-proof covers for meat and milk. A heavy head edging round a little mat of spare muslin converts it into an efficient cover for milk jugs.

Kitchen strainers can be improvised from muslin, and it has many other household uses in making poultice covers, bandages, stretched on frames to prevent the entry of flies through open windows, diffusers for amateur photographers, and for drying and polishing. See Dressing Table; Organdie.

MUSLINET. Made with coarser threads and in more open texture than fine muslin, muslinet is intermediate between muslin and net. Muslinet makes cheap window curtains.

MUSQUASH. The fur known by this name is commonly used for making fur coats. It comes from an animal, *Onychia zibethicus*, native to North America, where it is trapped extensively. It is very common, and more musquash skins are taken than any other. The animal has been introduced to Russia, and there it is multiplying rapidly. So in spite of its popularity with trappers (and buyers) there seems little likelihood of this rodent ever nearing extinction—a fate threatening some other fur-bearing creatures.

The musquash is also known as musk rat, because of its strong musky odour. It is about 12 in. long, plus 10 in. of scaly tail, and it lives in marshes and frequents slow streams. Its food consists chiefly of vegetable matter. The dense fur is brownish black above, tinted golden or reddish on the sides, and white below. It is sometimes treated and dyed by the furrier to imitate seal-skin.

MUSSELS. To prepare mussels for eating, they should be put to soak for some hours in clean cold water and the shells scrubbed with a stiff brush. The water should be changed

several times, to get rid of any sand there might be and possible traces of pollution. It is on the latter count that these bivalves are less commonly eaten than other shell-fish. When the mussels have undergone this preparation, put them in an iron saucepan, without water, over gentle heat. As soon as the shells open, the mussels are ready to be served in the shells, with brown bread and butter, after any foreign bodies have been removed, special care being taken to remove the green grass-like "beard". Vinegar or lemon juice should be taken with mussels.

Stewing Mussels. Boil them, then take them from their shells, and remove the beards. Strain all the liquor from mussels into pan. To every quart of mussels allow 4 oz. margarine. Roll this in flour and melt margarine with liquor. Add mussels with a spoonful of chopped



Musk Rose. White flowers and greyish-green leaves of this climber

parsley, a sprinkling of pepper and salt, and a spoonful of lemon juice. Shake the contents of the pan and simmer for about 10 min. Serve with croutets of toast.

Scalloped Mussels. To make scalloped mussels, prepare them as directed (in previous page). Take the mussels out of the shells and remove the beards. Strain the liquor and add to it 4 oz. margarine rolled in flour. When the margarine is melted, add the mussels and simmer for 5 min. Butter a scallop shell and sprinkle it with browned crumbs. Put in a layer of mussels, then a layer of crumbs with a piece of margarine on top. Continue this until the shell is filled. Pour the liquor over and brown the dish under the browning shelf of the oven.

Poisoning by Mussels. The popular idea that cooking destroys all poisons does not apply to mussels, which are sometimes poisonous whether raw or cooked. There is nothing to indicate this fact before they are eaten. The poison is present chiefly in the liver of the mussel.

The patient may suffer from irritation in the stomach, colic, vomiting, purging, cramp in the limbs, and netherlash. Sometimes he becomes numb and cold, the pupils of his eyes dilate, paralysis may develop, and he may become comatose. So virulent is the poison that death sometimes occurs within two hours.

As quickly as possible give an emetic composed of a tablespoonful of mustard in a large tumbler of warm water. As soon as the patient has vomited, give him a dose of 1 to 2 oz. of castor oil. If he becomes very weak before the arrival of the physician, weak brandy in tablespoonful doses every half-hour may be administered. The patient should be kept warm, and poultices or hot-water bags may be applied to the abdomen.

MUSSEL SCALE. Mussel scales are injurious to apples and less frequently to pears and currants, black and red. The insects also attack hawthorn, broom, and other plants. Trees that grow against walls suffer more than others, as the pests flourish most in warm, sheltered situations. The injury to the tree is caused by the loss of sap which is sucked up and devoured by the pests.

In the case of a bad attack, the trees or bushes should be sprayed when dormant, November to February, with an oil emulsion made as follows:

Paraffin oil	1 gal.
Soft soap	1½-2 lb.
Water	10 gal.

The soap is first dissolved in about a gallon of boiling water. The soap solution is then removed from the fire, and the paraffin is at once added, the whole being emulsified by squirting the liquid back into itself with a hand syringe. The strong emulsion may be kept until required for use, when the remaining 9 gallons of water should be added and the whole thoroughly stirred or emulsified again with the hand syringe.

If the pest has not been dealt with in winter—the best time—it may be greatly reduced by spraying when the eggs are hatching, about the end of May or early June. At this period a weak paraffin emulsion has proved satisfactory, and probably any other contact insecticide, such as nicotine and soap, would do as well. A suitable paraffin emulsion may be made as recommended in paragraph above, but using the ingredients in the following proportions:

Paraffin	2 pints
Soft soap	1 lb.
Water	10 gal.

See Apple; Insecticide; Pear; Spraying.

MUSTARD: The Plant. The hardy annual mustard plant is usually grown for table purposes in conjunction with cress. Seeds may be sown on the surface of fine soil at the

end of March, watered in, and followed by successive sowings every week until September.

Mustard and cress may be grown indoors all the year round by sowing seed on the surface of shallow pans or boxes of soil, watering in with tepid water, and keeping warm, or grown on flannel placed in a dish and kept moist in a sunny window. The true mustard is *Sinapis*. Mustard should be sown 3 days later than cress.

Use for Sandwiches. The young leaves of mustard, which have a pleasant and rather pungent flavour, can be mixed with cress into a green salad or may be used alone with bread and butter and salt. Mustard and cress makes excellent light sandwiches. The leaves should be washed thoroughly in cold, slightly salted water, to remove any seed cases or grit, and then swung in a salad shaker until dry. As a garnish for cold meats, etc., mustard and cress is invaluable; also, if a little is thrown into a saucepan of soup a few moments before serving, the flavour of the soup will be very much improved. See Cress.

MUSTARD: The Condiment. Two varieties of mustard plant, the black and the white, are cultivated in England, the mustard of commerce being the powdered seed of both. The black variety contains a volatile oil from which mustard derives its pungent colour, and this is accentuated by the use of turmeric for the bright yellow colour of the powder.

As a condiment mustard is taken with beef, pork, bacon, cheese, and other foods, though not usually with mutton; it also enters largely into the composition of most piquant sauces and dressings. To prepare it for table use, a small quantity of the powder is mixed in a cup with a few drops of water to the consistency of a thick paste, all lumps being broken up. More water is added, stirring all the time, until the mustard is just thick enough to lie on the edge of a plate without running down. The addition of a little salt is held to improve the flavour of mustard. It is best to make only a small supply at a time, and to replenish the mustard pot with freshly made condiment.

A very pleasant table mustard and one which will keep can be made by dissolving 1½ oz. salt in 1 pint boiling water, then pour it upon 1 oz. grated horse-radish, and let it stand 24 hours. Strain it and mix in, by degrees, sufficient dry mustard to make a smooth rather stiff paste. Equal quantities of horse-radish, chilli and tarragon vinegar can be substituted for the water.

French Mustard. French mustard is made from the black mustard seeds, which are much more pungent than the white or yellow seeds. Steep them in vinegar, garlic, thyme, mint, and tarragon until a full-flavoured vinegar is obtained, then grind the mustard seeds and pound them, adding vinegar by degrees to work them into a paste. Season it with salt.

Mustard Pots. A mustard pot is one of the members of a crust or condiment set. It takes a large number of forms, and is in various sizes, but is usually fitted with a hinged lid and supplied with a spoon to match. Sets are made in glass and in coloured pottery, com-

prising a mustard pot, one or two pepper pots and salt cellars. Mustard pots should match in style the other condiment containers on the table. The better pieces are in silver with glass liners.

Old silver mustard pots are much valued by collectors. They date, as far as England is concerned, from about 1750, and were often, as they are to-day, made with salt cellar and pepper pot to match. The majority are glass lined, the glass being usually blue, but occasionally rose in colour. The marks may be on the front, near the handle, or on the bottom, and, like all hinged articles, the cover should bear the same initials as the body. Some examples are beautifully decorated, those pierced and engraved with festoons and rosettes being especially noteworthy.

The three mustard pots illustrated on this page are beautiful examples chosen out of a large selection in order to give an idea of the varied shapes in which these articles were made. Mustard pots, remarkable for the beauty of their chased work, were made in Sheffield plate, and there is a representative collection of these in the Victoria and Albert Museum, South Kensington. See Silver.

MUSTARD: Its Medical Uses. In medicine mustard is used as a handy and reliable emetic, and also as an external application. As an emetic, the dose for an adult is a tablespoonful in half glass of water. Externally, mustard acts as a counter irritant, and may be applied as a plaster or a poultice. The most convenient form for use is the mustard leaf.

Mustard Plasters. To make a plaster, mix the mustard with cold water to form a thin paste, and spread upon brown paper. A little vinegar increases the strength. The mustard may be covered with a layer of muslin. A poultice is made by sprinkling a linseed meal or other poultice with mustard and covering it with muslin. The plaster or poultice may generally be kept on for 15-30 min., but for not more than 10 min. with young children or sensitive and delicate adults. A safe plan in the case of children is to mix the mustard with 2 or 3 times its weight of common or corn flour. The part may then be covered with a layer of cotton wool. When the plaster or poultice is removed, the skin should be wiped clean from all traces of the mustard, using for the purpose a very soft cloth.

Mustard Bath. For a bath the mustard should be made into a thin paste with cold water, and then stirred into the bath. For a foot bath add 1 to 2 tablespoonfuls of mustard to each gallon of water; the water should be as hot as can be comfortably borne. For a sitz bath, a tablespoonful of mustard should be used for each gallon of water. For the full bath of about 30 gallons of water, ½ lb. to 1 lb. of mustard may be used. The temperature should be about blood temperature. This is an admirable cure for chills, commencing colds, sleeplessness, etc.

MUTISIA. The kind generally cultivated is *Mutisia decurrens*, a climbing perennial which is not hardy except in a few exceptional

ally mild places. The flowers, which open in summer, are of orange-yellow colouring. Propagation is by cuttings under glass in spring. The plants may be grown in a greenhouse from which frost is excluded.



Mustard Pot. Three silver mustard pots of the Georgian period. 1. Example with beautiful pierced body showing blue inner receptacle. 1770. 2. Pot with dome-shaped lid and fluted base. 1822. 3. Octagonal specimen mounted on a pedestal. 1776

Courtesy of Chapple & Mansell

MUTTON: VALUE AND COOKING METHODS

The Housewife's Guide to a Popular Article of Food

In addition to similar articles on Beef, Lamb, Pork, etc., are referred to *Bonnie*, Breast; Carving; Diet; Food; Meat, etc., and other entries dealing with the subject of food. See also Caper Sauce; Cold Meat; Cutlet; Flavored Mutton; Mince; Onion Sauce.

Being highly nutritious and yet easy of digestion, mutton is preferable to beef for delicate persons or young children. The best meat is obtained from a sheep from 3 to 6 years old; under that age the flesh does not acquire the flavour of choice mutton. The leg is the most economical joint, as there is less bone and waste in proportion to the flesh; but it is liable to become tainted sooner than other portions of the carcass, especially if the kernel is not at once removed.

Leg of Mutton. Before the 1939-45 war a 7 lb. leg of mutton, and a shoulder of about 5 lb., were considered good average joints for family consumption.

Mutton should be cooked rather longer than beef in proportion to its weight, with the exception of chops and cutlets, which can be slightly undercooked if preferred. Mutton requires due attention when roasting, for if not thoroughly basted and the temperature regulated it will be dry and hard.

The leg can be boiled or roasted, but sometimes it is boned, stuffed with sage and onions, and trussed in an oblong shape, slightly flattened both sides, and baked or braised. It is then called *mock duck*. If intended for invalid diet, vegetables must be omitted when boiling a leg of mutton; but when served as a family joint it is usual to cook carrots and turnips with it and to hand them separately as a vegetable, either whole or mashed.

For a braised leg of mutton a very small joint is the best. Remove the kernels and trim the leg neatly; it should then be partly roasted and afterwards braised on a bed of vegetables, adding 1 or 2 slices of fat bacon and a bouquet garni. Care must be taken to turn the meat in the braise. The gravy, after being strained, must have the fat skimmed off before reducing it and pouring it over the meat.

Shoulder and Other Parts. Shoulders of mutton should never be boiled; they are too fat to allow the meat to look appetising, and the flavour is insipid. They should be either roasted or braised—roasted for preference—and served with a sauce which has some distinct flavour, such as onion. They may be boned and stuffed, by the method described earlier in this article for the leg.

The haunch (hind quarter) should hang as long as possible without being allowed to become tainted; then the shank should be removed and the flap trimmed, and it should be roasted and served with rich gravy. Red currant jelly should always be served as an accompaniment to this joint.

The saddle (double loin) before being roasted must be trimmed and the flaps folded under. A small skewer must be run through the kidney in each loin to prevent its becoming detached. The tail is left on, but is split in half and curled over each side the reverse way. A 10 lb. saddle will take from 2 to 2½ hours to roast. It must be remembered that the loin is not such a thick joint as the leg, and does not take long in proportion to cook. Serve with good gravy and red currant jelly.

Loin of mutton can be roasted whole, but should never be boiled. When roasted, superfluous fat must be cut away, and carving is easier if the chine bone is sawn off.

The breast is usually boiled, but can be boned, coated with stuffing, rolled up, and roasted, as described under the heading *Breast*. The neck is an economical joint for family consumption. When sold in the piece it is known as the *target* and comprises the best end, middle neck, and scrag end, and is

comparatively cheap if the whole is bought. The best end can be roasted or made into cutlets, the middle neck can be used for Irish stew, or a ragout with or without the scrag, while the latter can be made into broth.

Mutton Broth. Cut up 1 lb. scrag into small pieces and put these, together with the bones and a quart of cold water, into a saucepan over the heat. Add a little salt, bring the broth to the boil, and after skimming it add 1½ dessertspoonfuls rice, a leek, and a piece each of carrot, turnip, and celery cut up small. Simmer the whole for about 2 hours, then skim it again; take out the bones, add 1½ teaspoonfuls chopped parsley and seasoning to taste, and serve. Mutton broth is often made with bones only, no meat.

Mutton Chop. Grilling is the best way of cooking mutton chops, but they can also be fried or steamed. For grilling they should be at least 1 in. in thickness and should be cut from a well hung piece of mutton. Bid them of skin and any superfluous fat, and after trimming the edges flatten them with a cutlet bat and brush them over with melted dripping. Place them on a hot gridiron before the fire or under a gas grill, and cook them for about 10 min. This is the approximate time required, but it will naturally vary with the thickness of the meat. Serve the chops garnished with watercress, and with a pat of *maitre d'hôtel* butter on top of each.

To fry mutton chops, prepare them in the same way as for grilling, omitting, however, to brush them over with dripping. Melt a piece of dripping in a frying pan, and when it is smoking hot put in the chops. Brown them on both sides, and then

cooked, as they should be in 8-10 min., drain and serve them in the same way as grilled chops.

Mutton chops can be steamed by trimming and flattening them as already described, and placing them on a greased plate over a pan half filled with boiling water. Dust them lightly with salt, cover them with greased paper, and then with a basin. Take care that the water in the pan continues to boil, and add more if necessary during the course of cooking. After about 15 min. turn the chops and continue cooking them for another 15 min.

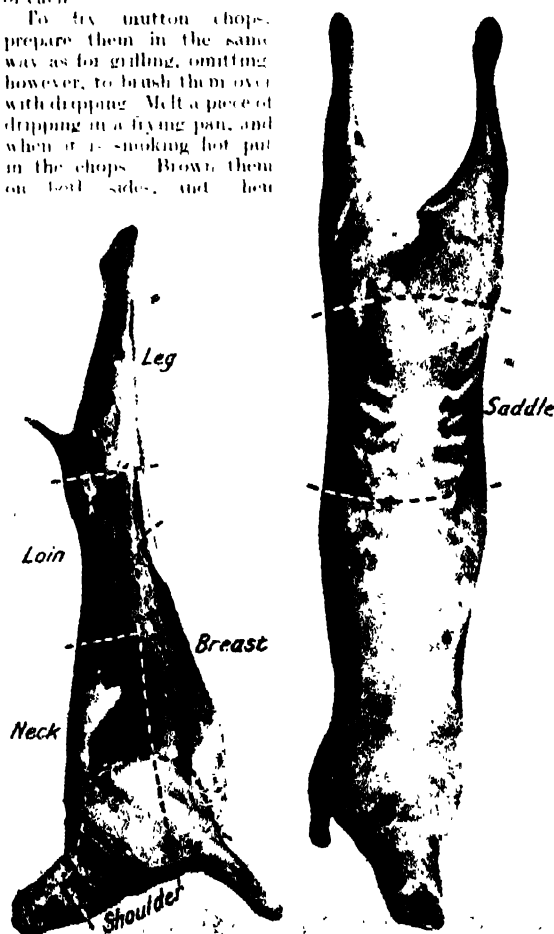
Kebobbed Mutton. Mutton kebobbed makes a choice dish, and one that can be cooked in the Dutch oven. Remove the meat whole from a loin of mutton and cut it into steaks, trimming off some of the fat. Mix with some breadcrumbs a little sweet herbs, a sprinkling of grated nutmeg, salt and pepper. Dip each steak into beaten egg, then into the prepared crumbs; place the steaks together as if they had not been cut asunder, and tie them back into shape with string. Cook them either in the Dutch oven or in a baking-tin in a hot oven, basting them with dripping and a small piece of margarine. When serving pour off the fat, sprinkle a little flour over the tin, mix it with the sediment from the meat, and stir into it by degrees ½ pint of good gravy. Add a little mushroom ketchup, boil up well, and pour this liquor round the meat.

Uses of Cold Mutton. Suggestions for doing up cold mutton are given under various headings. Excellent minced, curried, stewed in a casserole, or made into a shepherd's pie, it may also be used to prepare the following dish.

Free the meat from skin and gristle, then weigh out ½ lb. and mince it finely. Melt a piece of dripping about the size of an egg in a saucepan, add a breakfast-cupful of tomatoes—previously skinned and rubbed through a fine sieve—the minced meat, three well-beaten eggs, pepper and salt. Stir the whole over the heat, taking care that it does not burn, and when it is thoroughly hot, dish it on slices of toast, with chopped parsley on top.

To utilise the knuckle end of a cooked leg of mutton, trim it neatly and then put it into a pan containing a pint of hot brown gravy made from meat extract. Add a tablespoonful of Worcester sauce or ketchup, a little allspice, and a large grated onion. Cover the pan, and let its contents stew slowly at the side of the heat for about an hour, or until the meat is thoroughly heated. In the meantime, cook 2 oz. macaroni, cut into short lengths; wash and peel 2 large carrots and turnips, cut them with a vegetable cutter into balls about the size of marbles, and cook them in boiling salted water until they are tender. Dish the stewed knuckle on a hot dish, place a paper frill round the bone, and strain the sauce round. Around the meat arrange alternate heaps of vegetable and macaroni, sprinkling a little chopped parsley over the latter.

Another good way of using up cold roast or curried mutton is to make it into croquettes. To prepare these, wash ½ lb. rice and boil till tender in plenty of fast-boiling salted water.



Mutton. Left, side view of the carcass of a sheep, showing position of joints into which it is cut by the butcher. Right, head view, showing the position of the joint known as the saddle.

Drain off the water thoroughly, and put the rice on a plate in the oven to dry.

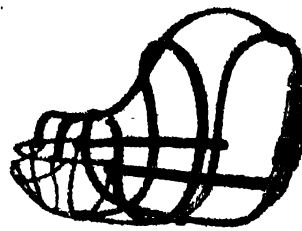
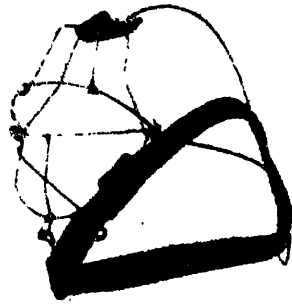
Fry a teaspoonful chopped onion in 1 oz. dripping in a saucepan, and when it is well browned add $\frac{1}{2}$ oz. flour and $\frac{1}{2}$ dessertspoonful curry powder, frying these for a couple of minutes. Pour in $\frac{1}{2}$ pint stock, stir the mixture until it boils, and then add $\frac{1}{2}$ lb. finely chopped cold mutton, 1 teaspoonful lemon juice, the cooked rice, some salt and pepper to taste, and lastly the beaten egg. Mix all these ingredients thoroughly together, spread the mixture evenly on a plate, mark it into even-sized divisions, and leave it until it has become cold.

Shape the divisions into neat balls, brush the latter over with beaten egg, and cover them with bread crumbs. Put plenty of frying fat in a pan over the heat, and when a bluish smoke rises from it put in the croquettes, frying them a golden brown. Drain them, and serve them on a lace paper garnished with pieces of fried parsley.

Either the shoulder or the neck can be done up as a stew or ragout in a casserole. Cut up 2 lb. into neat pieces, removing any superfluous fat and bone, and fry them lightly in 1 oz. margarine melted in a casserole. When slightly browned on both sides take out the meat and put in its stead 2 shredded onions, 2 carrots cut into dice, and $\frac{1}{2}$ oz. flour. When these ingredients have browned thoroughly, pour in 12 pints warm stock or water, stirring all the time, and bring the whole to the boil.

Then put in the meat, a bay leaf, 2 oz. pearl barley which has been soaked overnight, and season with salt. Place the lid on the casserole and gently simmer its contents in a moderate oven until the barley is soft. Then skim off the fat, take out the bay leaf, and serve the ragout in the casserole. If the barley absorbs the stock, more must be added.

MUZZLE. In Great Britain the Ministry of Agriculture and Fisheries possesses the power to make orders regarding the muzzling of dogs, the seizure, detention and disposal (including



Muzzle. Fig. 1 (left). Wire muzzle for a Pekinese or other small dog. Fig. 2 (above). One made of leather and wire, suitable for a terrier.

destruction) of unmuzzled dogs, and the recovery from the owners of the expenses incurred in respect of their detention. Orders may be made to prevent dogs from straying between sunset and sunrise. If an offence is being committed in respect of any dog, the dog may be treated as a stray. A muzzling order may be revoked or altered from time to time, and may be made to apply either to the whole country or to a particular area.

The effect of a muzzling order is that any person who keeps a dog is liable to a fine and to pay the cost of the summons if the dog is found in any public place unmuzzled, whether it is the person's fault or not. It will not avail him to prove that the dog was muzzled when he let it out and that some one must have stolen the muzzle; nor that the dog escaped unmuzzled through the negligence of a third person.

The Town and Country Planning Act, which applies to most towns in England, makes it an offence to allow a person's dog to be at large unmuzzled, i.e. to be in a public street or place or on farmland. The word "allow" implies knowledge on the part of the dog owner. It is a moot point whether this means knowledge that the dog is ferocious, or knowledge that it is at large.

Types of Muzzle. Dog muzzles are of

two kinds, the leather and the wire cage shape. The latter is usually ordered by the authorities in outbreaks of rabies. It is not as comfortable as a leather one, and if the latter fits properly it should be equally effective. In the wire muzzle for a toy dog, shown in Fig. 1, a small pad has been arranged so as to avoid pressure of the wire point on the animal's head. Fig. 2 shows a combination of leather and wire for a larger dog. Whichever type of muzzle is used, care should be taken to get one of the proper size that does not pinch the

animal's jaws too closely together. See Dog.

MYOPIA. The technical name for short sight is myopia. Parallel rays of light falling on the cornea are focussed in front of the retina, or, in other words, the eye is too long.

The condition may be progressive, and it is desirable that children who are shortsighted should not have their books or similar work too close to the eyes, not nearer than 10 to 13 in., also that the type should be large and the light good. See Eye; Spectacles.

MYOSOTIDIUM. The perennial plant *myosotidium*, also known as the Chatham



Myrica gale, a British plant with fragrant leaves, suitable for growing in moist, peaty soil.

Island forget-me-not, is a difficult plant to grow, but when it succeeds it becomes a very handsome object, bearing flowers like very large forget-me-nots. It requires a moist, sheltered position, and must be grown in loamy soil. It does best in maritime counties in the south-west district. Propagation is by seeds,

which should be sown in the summer.

Myosotis. This is the botanical name for the popular hardy plant forget-me-not (p. v).

MYRICA. Of these hardy shrubs, one, *Myrica gale*, grows wild in boggy ground in parts of the British Isles. *Myrica cerifera* is known as the wax myrtle; it has fragrant leaves and the fruits exude a wax-like substance. Another kind is *Myrica californica*.

Using the Wax. The wax from the minute fruits, which are known as candle berries, can be obtained in the following way: A pot of boiling water is prepared, into which the berries are placed; the wax melts and floats on the surface of the water, from which it is collected and fashioned into little candles, which give off a delightful fragrance when burnt. Such candles would make excellent Christmas decorations.

MYROBALAN PLUM. Used as an alternative to privet and quick the myrobalan plum (*Prunus cerasifera*) is often seen in hedges. Its variety *atropurpurea* has purplish leaves. When full grown the



Mutton: the joints. 1. Shoulder. 2. Loin, showing position of kidney under the fat. 3. Leg. All are good joints for roasting. 4. Neck, showing the positions and shape of the scrag end, middle neck and best neck.

myrobalan plum is from 8 ft. to 10 ft. in height, and in favourable situations has reddish fruit in the autumn. Plants may be successfully raised from fruit stones. *See Hedge.*

MYRRH: The Herb. Myrrh, or sweet oleo. *Myrrhus odorata*, is a hardy perennial herb with sweet smelling leaves and white



Myrrh. Much-divided leaves of the sweet-scented herb *Myrrhus odorata*

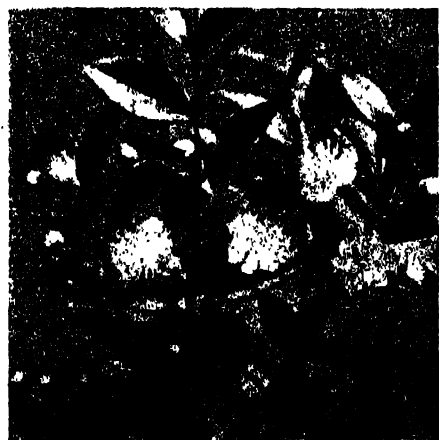
flowers. It thrives in the open border in any soil, and reaches a height of about 2 ft. Propagation is by seed, or division of the roots.

Medicinal Uses. The gum resin known as myrrh is the product of the balsamodendron, a small tree grown in Arabia and elsewhere in the East. Combined with borax, as in the following prescription, myrrh is a favourite gurgel in inflamed conditions of the tongue, cheeks, or gums, and in a relaxed throat.

Tincture of myrrh	4 fluid drams
Borax	24 gr.
Glycerin	1 fluid dram
Eau-de-Cologne to make	2 oz.

A teaspoonful of the above mixture should be used in a small glass of water as a mouth-wash or gargle. The tincture of myrrh is given in doses of $\frac{1}{2}$ to 1 dram. *See Mouthwash.*

MYRTLE. The fragrant myrtle (*Myrtus communis*) is a greenhouse and half-hardy evergreen shrub which can only be grown out of doors in mild districts, or against walls with winter protection in cold localities. The flowers are white and fragrant; they produce black fruits. Myrtles do best in fertile loamy soil, well lightened with leaf-mould and sand. They require a good deal of water in summer, and will benefit by frequent syringing. Any necessary pruning should be done in spring. Propagation is by cuttings in sandy soil under a hand-light in summer.



Myrtle. Fragrant white flowers of the evergreen shrub which needs a sheltered outdoor situation

NAILS AND HOW TO USE THEM

The Various Kinds and their Proper Uses

THE author suggests reference to almost all the woodworking articles in this work, but they only call for the mention, e.g. *Amateur Carpentry*, *Cabinet Making*, *Door*, *Draw*, *Table*, *Box*, *Chair*, *Nail*, *Clout Nail*.

Of the many varieties of nail in use a number are illustrated in Fig. 1. Iron and steel nails are liable to rust if exposed to the air or allowed to become damp. They should be kept in their original packets or arranged in a box divided into sections.

French or wire nails are made in sizes from 1 in. to 6 in. long, and in various thicknesses. Useful sizes in the 1 in. length are known as 16 gauge, in the 1 in. 13 gauge, in the 2 in. 11 gauge and in the 6 in. 4 gauge. The oval wire nail or brad does not hold so well as the French nail, but it has less tendency to split the wood, and for internal work the head, being long and narrow, easily sinks into the grain of the wood and is almost invisible. The shanks of the oval and wire nails are generally roughened near the head, so that they hold better in the wood and there is a smaller chance of their coming loose.

Cut nails are made by punching from sheets of thin metal. They are rectangular in section, and generally tapered or wedge-shaped. The amateur will find it wise to use this class of nail only when the work is fairly substantial and not less than 1 in. in thickness, otherwise the wood is likely to split. The ordinary cut clasp nail is provided with a T-shaped head, so that when driven into the wood it draws the two parts firmly together.

The floor nail has an L-shaped head, and is used almost exclusively for nailing down floorboards to the joists, the purpose of the projecting piece on the head being to draw the floorboards tightly against the joists. The wall nail is a stout round nail, resembling a thick French nail, and is intended generally for driving into brickwork. Rose-headed nails are made with a round and modelled head and long, flat pin; they are used on exterior work where the head will be exposed; the large area under the head serves to hold one part to another.

Joane's brads are a variety of floor brads, ranging in length from $\frac{1}{2}$ in. to 2 in., being small in size they are useful for nailing on the backs of furniture and similar purposes. Hob nails are generally used on the soles of boots, but as they are of variously shaped heads they are often employed as a decorative device on doors. The lath nail is a form of wire nail with a broad, flat head, intended chiefly for nailing laths to the stud partition intended to be plastered; a variety is made in the form of a cut lath nail.

Cast wall nails are often utilized for garden purposes in the training of plants; they should be driven into the mortar joints in the brickwork, since not being very strong, they are liable to break if driven into hard material. Clout nails have a very broad head, circular in section, and are made in the form of a wire or wrought nail. They are employed for fastening roofing felt and similar material.

Brass-headed nails are made in many fancy patterns, the heads being of polished brass. They are intended for the support of pictures or for fastening an overmantel or similar pieces of furniture to the wall, the brass heads alone being visible. Brass-headed nails of small size are used for many decorative purposes. The panel pin is a fine wire nail with a conical-shaped head of small diameter. It is invaluable for fastening two pieces of thin material together and should always be used with thin wood of any description. Although the nails are small in diameter, they are very efficient and hold well.

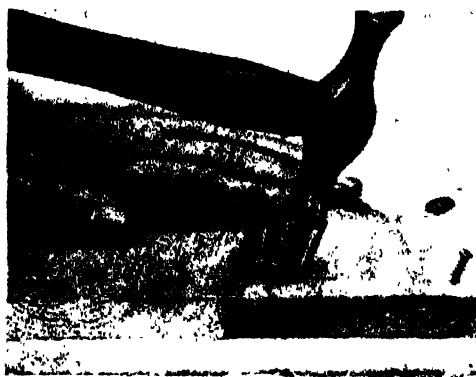
Use of the Hammer. The whole secret of driving a nail lies in the use of the hammer. It should be held rather loosely and near the end of the shaft. The nail must be struck fair and square on the head, and the hammer should fall in a straight line with the path of the nail, otherwise the nail will not be driven in straight. There are other methods, however, beside the ordinary one of driving the nail straight in. For example, if a nail be driven at



Nail. Fig. 1. Typical varieties of nails; their uses are described in the text

an angle through a piece of wood it will drive the wood in the direction in which the nail is pointing. Consequently, if two boards are to be nailed on to joists or battens, the joint between the boards can be brought close up by first nailing one of the boards and then nailing the second with the nails inclining toward the board already fixed. This is illustrated in Fig. 2. Another way

of driving nails is known as dove-tailing, in which each nail is driven at an angle into the wood so that it can be drawn out readily. A common method of driving a nail to prevent its being withdrawn is known as clenching (Fig. 3). The nail is driven



Nail. Fig. 2. Nails set diagonally draw a joint up tightly. Fig. 3. Clenching a nail; right to left are shown the three stages in the process.

right through the material so that about 1 in. projects on the opposite side. This portion is then struck with the hammer near the point so that the pointed end of the nail is bent over. Further blows drive the remainder of the projecting portion down into the work. The object of first knocking over the point is that the point may then be driven into the wood, thereby holding the clench firmly.

The work to be nailed should rest upon a solid base, as it is very difficult to drive a nail into a springy piece of wood. If no support is available, it will be necessary to hold a hammer, or some heavy tool, behind the place where the nail is to be driven through the thinner piece of material into the thick.

Splitting of the wood is a frequent cause of trouble. It is always advisable to make small holes with a bradawl through wood that is liable to split and then drive the nails through the holes. In very hard wood it is sometimes difficult to drive a nail unless a hole is bored first, but in this case the hole should be somewhat less than the diameter of the nail, so that the latter may get a firm hold. Another point is to avoid having two nails in the same grain of wood. The nails should be zig-zagged, or staggered, as in Fig. 4, so that each nail is separated by as much untouched wood as possible.

Secret Nailing. When several boards are to be laid and nailed so that the joints do not show a great deal a method of diagonal nailing may be used. The nails can then be driven diagonally into the edge of one plank so that when the next plank is placed against it and driven home the nail will be invisible. Generally this method is adopted with rebated boards so that the second plank may interlock the first.

Another method of secret nailing consists of making an incision into the wood with a tool like a very fine gouge. This raises a shaving, which is bent back and the nail driven in the cavity and punched well down, as in Fig. 5. The shaving is glued and then pressed back into position, and after the glue has set the face should be sandpapered till smooth and all traces of the nail is lost.

In good work the nails are always punched below the surface of the wood, and especially should this be done when the work is to be finished by painting, as the nail holes may then be filled with putty or one of the numerous stoppings on the market. Nail punches or nail sets are made for this special purpose, but almost any plain punch will answer. Cross nailing (Fig. 6) or skew nailing, as it is sometimes called, is generally used to fix the uprights on to the bottom plate. It consists in driving the nails diagonally through the lower part of the upright into the bottom plate.

NAILS: Their Care. Growth at the root of the nail constantly pushes it forward, hence the need for cutting or filing. In the case of finger nails the points may be rounded, toe nails must be left square.

Nail-biting is a habit with many children, sometimes persisting on to later life, and mothers cannot be too decided in checking it while the child is young. Something bitter, such as aloes or quinine, should be put on the finger tips.

If this fails, mustard may be used, but only while the mother or nurse keeps watch, as he might put his fingers to his eyes. A child who is inclined to bite his nails will generally do so on first waking.



Fig. 4. Correct spacing of each nail in different grain of wood. **Fig. 5.** Secret nailing, left to right: Chip turned up; nail partly driven home; clenching nail home; opposite arrow, chip pressed home on nail head. **Fig. 6.** Skew nailing an upright to a horizontal member.

from sleep, so it is well to put the hands in gloves when putting him to rest.

If nails are filed daily with an emery board, they will be kept nicely shaped and always the desired length. They should not be filed down at the sides (a common fault), as this removes the support from the tip, causing it to break. After washing, an orange stick dipped in cuticle remover should be passed all round the cuticle, pressing it back very gently. The nails should be washed in soapy water at night, dried carefully, and cuticle cream applied with an orange stick. Varnish can be bought in all shades, liquid or cream, and should be applied with firm, downward strokes. A nail varnish can be made by dissolving one drachm of paraffin wax in 2 oz. of chloroform. Peroxide of hydrogen, and lemon juice, will bleach discoloured nails.

Abscess in the Nail. An abscess may form under the nail or at the root as the result of some injury, or a small infected wound such as may be caused by a splinter of wood. The pressure of the confined pus (matter) causes severe pain. When an abscess threatens, the end of the finger should be wrapped in lint soaked in hot solution of boric acid (one tea-spoonful to the pint of water). The lint should be removed frequently or covered with oiled silk or a large rubber finger-stall. The hand should be kept well raised by means of a sling. If the abscess forms, relief can be obtained only by having it opened and letting the matter escape. Inflammation of the nail matrix, or onychia, may arise from several causes, including infection by the microbes which produce suppuration.

Toe Nails. With ingrowing toe nails the edge of the nail, by pressing against the soft skin near it, may set up great irritation. They are caused chiefly by wearing boots and shoes which are too narrow. Harm is also done by rounding the toe nails when cutting.

Keep the edge of the nail from getting embedded in the flesh by forcing a small piece of cotton wool under it. The pressure can be eased by soaking for 10 min. in very hot water, and gently scraping the centre with a sharp knife. It will be easy to raise the corner of the nail and put in the cotton wool, which should be well pressed in under the nail. This wool must be renewed morning and night. Keep the toe nail cut square and in a perfect state of cleanliness, and wear sufficiently easy boots and shoes, and the trouble will disappear.

The Nail Brush. The choice of a nail brush ranges from a very plain, cheap article to the superior varieties, which may be regarded as a better investment.

A convenient addition is often made by fixing a thin brush of one row of short, stiff bristles flat to the back, this being helpful in cleaning the under surface of nails. A concave back may have two or three rows of knots so arranged that each row brushes a different part simultaneously. In all qualities the knots may be either punched into holes by a machine process or hand-made, the knots being drawn into position by wire.

Nail brushes are made from various materials. The best consist of pure bristles set in a hardwood or bone handle. Cheaper nail brushes have nylon or other synthetic bristles cemented into plastic handles. Nail brushes with nylon bristles should not be left damp, or with soap adhering to the bristles, or the bristles will become soft and matted.

NAINSOOK: The Material. Although a very thin cotton material, a good quality of nainsook wears fairly well for children's finer undergarments. It has not quite the strength of a cambric made with more threads in the square inch and should be washed and ironed with extra care.

NAMES: SOME LEGAL CONSIDERATIONS

With Suggestions on the Choice of First Names

This contribution concludes with a list of some of the more popular Christian names in use in Great Britain with the meaning of each. See Naturalization

The names given to a child, together with its surname, are told to the registrar when the birth is registered, and are recorded by him. When a child is baptized, its Christian names are pronounced by the clergyman or other person officiating at the baptism, and are entered in the parish or other register. The names are thus on record for all time, and cannot legally be changed except by Act of Parliament or by the bishop at confirmation, although in practice many persons add an additional name to those given at baptism. This should be done cautiously, however, as it may be difficult for a man who has made himself known as Thomas Wilson Jones to prove that he is the Thomas Jones entitled to a legacy of £5,000 under an uncle's will.

Changing a Name. In Great Britain an alien is not allowed to change his first or surname without the leave of the Home Secretary. A British subject can, however, change his surname and can in effect call himself anything he pleases. This, however, is subject to the requirements of the Business Names Registration Act, which makes it compulsory for anyone who carries on a business not in his own name to register the name of the business and his own names as proprietor, and to put his real names on all his business notepaper, and documents generally.

Subject to this, anyone who wishes to change his surname can do so without any formalities at all. If, however, he wishes for any reason to put the fact on record so that it shall be easy to trace the fact that he has changed his surname, the easiest way to do it is to have a deed drawn up in which he declares that he, John Scott, intends for the future to take the name of Montcrieff. This deed he can enrol at the royal courts of justice. He will be well advised also to advertise the change of name in a few leading newspapers. There is a 10s. stamp on the deed, and a small fee for enrolment. Some persons, however, obtain a royal licence, the fee for which is about £40.

Wills and settlements relating to family properties sometimes contain what is called a name and arms clause. The estate is given to somebody, very often a man who has married the female heir to the property, upon the condition that he shall assume for himself and his children the name and arms of the original family. In these instances it is proper to apply for the royal licence, and also to the College of Heralds for a grant of the arms.

Giving a False Name. Anyone, other than an alien and except under the Business Names Act, can call himself any name he likes, unless he assumes a name which he has never previously been known by for purposes of deceit. He might find himself prosecuted for obtaining money or goods by falsely pretending he is Jones when he is really Smith.

It is also an offence to give a false name on applying for a licence or publication of banns for marriage. But supposing a man for some reason of his own, as, for instance, that he does not like his father's name, chooses to call himself by another name, any legal transaction that he enters into in his adopted name is perfectly good.

No one may change his Christian name, i.e. the name in which he is baptized. But anyone can use any first name he pleases, and give up using his Christian name. If within 12 months of the registration of a birth the parents wish to add a name, as, for instance, on baptism, or a mistake has been made about the name, the new name can be added by the registrar of births. But if the new name is

one which has been added on baptism, a certificate from the clergyman or minister must be produced. Every limited company must show in all trade circulars and letters the present first names and surname of each of its directors and also any former first names and surnames, nationality if not British, and the nationality of origin if he has changed his nationality.

Christian Names. The term Christian name is loosely used to describe all first names of persons. Strictly, no unbaptized person can have a Christian name. It is obviously absurd to speak of the "Christian name" of a Jew, or of a Mahomedan; but as the term "Christian name" is now so generally applied to the first names of persons irrespective of their religious faith we use it here. An enormous number of Christian names, both for boys and girls, are in existence, and parents are sometimes bewildered when they have to choose a name for a child. This is especially so in these days, because so many children are given two or three Christian names. In former days one was deemed sufficient. The choice is usually fairly easy in the case of an eldest son or daughter, for there is almost always a family association with certain names.

By long association some families choose certain first names for the eldest son. The Wakes invariably name the heir Hereward; the Curzons prefer Nathaniel; the Raleighs call their eldest sons Walter; the Sidneys use the name Philip.

Reasons for the Choice

Many popular Christian names have been adopted from surnames. This is frequently the maiden name of the mother, or the name of some distinguished family to which the child is allied; examples are L. She, Keith, Neville, Douglas, Oliver, Olive, &c.

Millions of persons, however, are without known associations with the distant past, while younger sons and daughters must be named, for boys cannot, in practice, like the ex-prince of Wales, be all named Heinrich and then numbered.

A common plan is to give a child a name or names borne by a godparent, and this, a practice of great antiquity, accounts for many Christian names. Another plan is to name a child after the saint on whose day it was born. Thus a child born on Oct. 18 will be named Luke if a boy, Lucy if a girl. A boy born on Nov. 30 will be named Andrew. Associated with this is the practice of naming a boy Noel, a girl Carol, if born at Christmas, and a girl Avril (April), May, or June, if born in one of these months.

Fashion plays a large part in the naming of children. Sometimes it shows itself in vagaries which cannot always be explained. A name, Joan or Alan, suddenly becomes popular. At other times the fashion can be traced, and in this royalty plays a large part. This accounts for the popularity of George and Charlotte for a century after the marriage of George III; for the later vogue which Albert enjoyed; and the still later one of Elizabeth. Charles and Anne, inspired by Queen Elizabeth II and her children. Many girls were named Marina after the marriage of the Duke of Kent and Princess Marina of Greece.

Great men leave their mark on Christian names. The vogue which Arnold and Stanley enjoyed in the 19th century was due to the fame of the schoolmaster of Rugby and of the explorer of Africa. Gordon is another instance. Peter became popular owing to the play Peter Pan. Wars generally lead to a demand for

names borne by the soldiers and sailors who distinguish themselves during those periods.

The most popular Christian names, however, are still the simple ones originally borne by the saints. John and Mary, Margaret and Thomas, for example. This is due, perhaps, less to their religious associations than to the fact that the names are found in almost every family circle, and are, therefore, sure to be chosen very frequently. Allied to this are the patriotic associations which are responsible for the frequency of Robert and Andrew in Scotland, and Patrick in Ireland.

One class of girls' names consists of those which are formed from masculine ones, thus following a Roman model. These include the feminines of John—Joanna, Jane, Joan, and others. Philippa, Josephine, and Georgina are other examples. In this way girls can perpetuate the name of a father or a distinguished member of the family. Another class of names for girls is taken from flowers and plants, Rose, Lily, and Ivy, for instance. Names of the appropriate birthstones, Ruby, Pearl, etc., are popular. Another draws upon the various Christian and other virtues and attributes, whether in English, as Hope and Faith, or in Latin, as Vera.

In choosing a name it is well to consider whether the child can in this way be linked to the family to which he or she belongs by blood. This should not be carried too far, and relationships with great families assumed without examination. If the names of the near relations, parents, and grandparents are already taken by elder brothers and sisters, a search can be made for more distant ancestors.

A consideration of importance is euphony. Preference should be given to a name that sounds well when linked with other Christian names and with the surname. Henry Higgins and Robert Robertson do not sound particularly well; still less so does Montagu Tigg. Combinations such as Victoria Alexandra and Irene Phyllis also lack euphony. But Mary Morrison and John Lindley have simple dignity. Algernon and Reginald go well with some surnames but ill with others, and the same can be said of many other names. Sometimes the obstacle to euphony is in the surname, and the choice of a Christian name should avoid accentuating this. Parents and godparents should also avoid giving children names the initials of which can form an unpleasant word. For instance, a girl whose surname is Dawson or Davis should not be named Margaret Alice, nor should a boy with the surname of Gillespie be christened Douglas Oliver.

Below we give a list of some of the names in general use in the British Isles for both girls and boys, with the meaning of each.

Names for Girls

Ada—rich gift	Edith—rich gift
Agnes—pure (Gr.)	Eileen—Irish form of Helen
Alice—noble cheer	Ellen—form of Helen
Ann—beloved	Eileen—form of Helen
Ann or Anne—grace (Heb.)	Eileen—form of Helen
Barbara—foreign	Emily—crafty
Beatrice—blessed	Emma—industrious
Bertha—bright	Ester—star (Assyrian)
Beryl—soothsayer	Ethel—noble
Betty or Bessy—dim. of Elizabeth	Eva or Eve—life (Heb.)
Blanche—white	Evelyn—life (Heb.)
Brenda—sword	Fanny—free (from France)
Bridget—strength	Florence—flowering
Caroline—form of Charles	Frances—free
Catherine—pure	Geraldine—firm spear (form of Gerald)
Charlotte—form of Charles	Gertude—spear maiden
Christine—Christian	Gladys—glad (Welsh form of Claudia)
Clara—bright	Grace—thanksgiving
Constance—faithful	Gwendolen—white bow
Daisy—pearl (Persian)	Hannah—grace (Heb.)
Diana—goddess	Harriet—home ruler
Dorothy or Dora—gift of God	

NAME PLATES FOR PRIVATE HOUSES

Graceful Styles and Novel Ideas for Town and Country Homes

Several ways of making name plates are suggested in this article and practical directions are given. See also the articles on Chip Carving, Lead Art Craft, Lettering, Repoussé Work, Stencilling, Woodcarving.

While the chief use of a name plate is to indicate the house as a guide to visitors and tradesmen, the decorative side of this accessory need not be overlooked. In choosing a style the type of house will be borne in mind. What would look pretentious on a cottage porch may be quite in keeping with the entrance of a large house on the outskirts of a town, and what would be somewhat aggressive on a terrace door, will be pleasantly arresting on that of a seaside bungalow.

In town streets of any length it is always advisable to have a number as well as a name on the gate or door. There is nothing so irritating for those visiting a home for the first time as the search for a name only without the assistance of a number, in a row of villas which all look alike. It is also a convenience where the front door is only a little way from the gate, and the latter does not mark the corner, if name and number are repeated on the door. Taxi drivers and tradesmen frequently only look at doors in such cases. At night the name on the door can be lighted by a lantern fitting on, where there is a porch by a lighting fixture in the roof of this. If there is a glass knocker the number can be written on the middle pane, or better still for visibility, on a glass lamp projecting from it.

For houses where the front door is concealed behind a high gate and brick walls the name plate can be placed symmetrically to balance the letter box or number, or can be affixed to the gate where this is of wrought iron, the plate taking the form of a circular iron disk with the name in neat lettering.

As a general rule, in choosing a name plate for a town house the simpler it is the better.

The first illustration shows an example of a suitably designed and perfectly placed name plate for a decorative door. For the 18th century style of entrance the name plate looks best either just above the door, or on the upper part of the door itself when the panelling permits. Displays of name and number on the walls at the side of the door, or painted on the columns, when such an entrance possesses these, take away from the beauty of the doorway. Any exaggerated type of lettering would be disfiguring.

In the country, signposts and wrought iron brackets are sometimes utilized to carry more ornamental name plates. Such a style can be delightful for a picturesque stone-tiled house or a thatched cottage, as shown in Fig. 2. The name plate illustrated is cut out of wrought iron plate. It will never wear out, warp or crack, and such plates can be obtained in a variety of designs. Painted signboards are suitable and gay for a seaside bungalow, if carried out in a modern design descriptive of the title, and have the advantage of being little likely to be passed by unnoticed when suspended from a wrought iron bracket. As the colors used to paint such a sign will be exposed to the weather, paint with a hard glossy surface should be chosen.

Suitable for a sedate little house, either in town or in country village, is the name plate shown in Fig. 3, with its white painted wooden letters on a base which matches the door in colour. Perfectly simple in form, it is the position of the plate which attracts the eye in this case and is far more effective placed on the wall than on the door itself. On a chequered pale gateway, or any rustic entrance, the incised wood name plate illustrated in Fig. 4 is the most suitable.

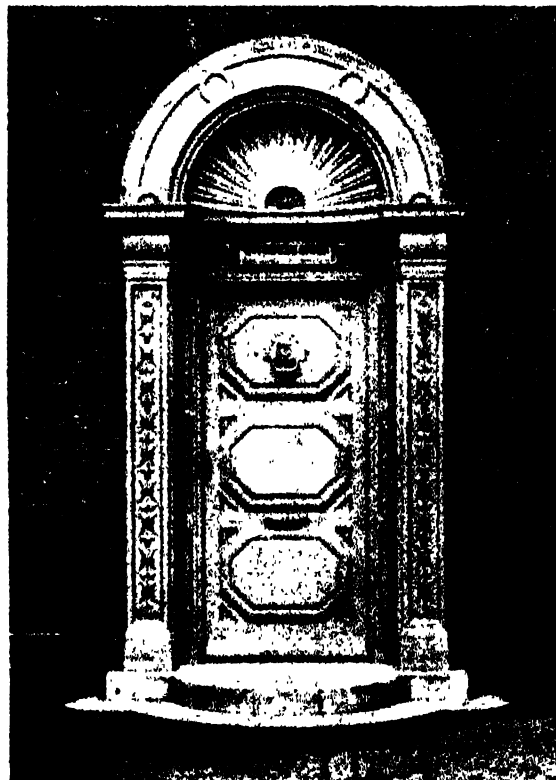
Constructive Details. For a house the size of a name plate varies not only in accordance with the amount of the lettering thereon, but also with the style chosen. The smallest size is about 10 by 3 in. Brass plates used for business or professional purposes vary from 8 by 3 in. to 18 by 12 in. on the average, and are engraved with one line or two line lettering in sizes from 1/4 in. to 3/4 in. Name plates are also employed indoors for various purposes, to distinguish particular rooms, or for drawer fronts and boxes.

Name plates can be made up from various materials the choice being governed to some extent by considerations of durability and appearance. For exterior work oak, copper, brass, and lead are good both on the score of durability and of general suitability. Ornamentation may be effected by various processes. In the case of a wooden name plate, the letters may be incised as in Fig. 4, or may be raised by carving. Another method is to cut the letters to shape from comparatively thin material, and apply them to the plate. Such a plate is seen in Fig. 3. Here the wooden letters are painted,

Heleen—torch (Gr.)	Nancy—grace (Heb.)
Hilda—little maiden	Nora—dun or Honoria or Eleanor
Irene—peace	Oiga—holy or light
Iris—a flower	Olive—fem. of Olive
Jane or Janet	Patience—all sweeties
Joan—fem. of John	Patience—patience
Joseph—fem. of Joseph	Peggy—dim. of Margaret
Julia—fem. of Julius	Phyllis—green bough (Gr.)
Katherine—Catherine	Polly—form of Mary
Kathleen—fresh form of Catherine	Prudence—prudence
Laura—laurel (Lat.)	Richard—a ewe (Heb.)
Lily or Lilian—lily	Rhoda—rose (Gr.)
Macl—lovable	Rosalind—a rose
Mabel—dim. of Margaret	Rose or Rosa (Gr.)
Margaret—pearl	Ruth—friend (Heb.)
Margaret—form of Margaret	Sarah or Sara—princess (Heb.)
Marian—form of Mary	Shelia—blind (Lat.)
Mary—bitterness	Sophia—wisdom
Matilda—mighty battle maiden	Stella—star
Maud or Maude—form of Matilda	Susan—rich (Heb.)
May—dim. of Mary	Sybil or Sybil—prophetess
Maya—magic	Trisula—little bear
Mildred—gentle strength	Verity—truth
Milcent—strong in work	Violet—violet
Mirella—wealth	Winifred—friend of bees

Names for Boys

Adrian—Adrian (Heb.)	Lawrence—fence warrior
Adrian—Adrian (Heb.)	Leonard—lion strength
Alfred—nobly bright	Leopold—prince of the people
Alfred—nobly bright	Levi—famous in war
Alfred—nobly bright	Lincoln—strong lion
Alfred—nobly bright	Llewellyn—lion like
Alfred—nobly bright	Luke—born at daybreak
Alfred—nobly bright	Malcolm—servant of Colman
Alfred—nobly bright	Marcus—English variant of Mark
Alfred—nobly bright	Mark—spring from Mars
Alfred—nobly bright	Marmaduke—sea hawk (Heb.)
Alfred—nobly bright	Martin—of Mars warlike
Alfred—nobly bright	Matthew—God's gift
Alfred—nobly bright	Maxwell—mouth of the sea
Alfred—nobly bright	Michael—like God (Heb.)
Alfred—nobly bright	Nicholas—victory of the people (Gr.)
Alfred—nobly bright	Noel—Christmas
Alfred—nobly bright	Norman—Northman
Alfred—nobly bright	Olive—olive tree
Alfred—nobly bright	Oscar—bounding warrior
Alfred—nobly bright	Oswald—heavenly power
Alfred—nobly bright	Owen—young warrior (Heb.)
Alfred—nobly bright	Patrick—nobel (Lat.)
Alfred—nobly bright	Paul—small (Lat.)
Alfred—nobly bright	Perceval—meaning doubtful
Alfred—nobly bright	Peter—stone or rock
Alfred—nobly bright	Philip—lover of horses
Alfred—nobly bright	Ralph—wolf of fame
Alfred—nobly bright	Raymond—wise protection
Alfred—nobly bright	Reginald—great set
Alfred—nobly bright	Richard—stern king
Alfred—nobly bright	Robert—bright in fame
Alfred—nobly bright	Robin—fem. of Robert
Alfred—nobly bright	Roger—speaker of law
Alfred—nobly bright	Ronald—great sense
Alfred—nobly bright	Roland—fame of the land
Alfred—nobly bright	Rupert—form of Robert
Alfred—nobly bright	Samuel—asked of God (Heb.)
Alfred—nobly bright	Simon—obedient (Heb.)
Alfred—nobly bright	Stanley—a place name
Alfred—nobly bright	Stephen—crown (Gr.)
Alfred—nobly bright	Theodore—gift of God (Gr.)
Alfred—nobly bright	Thomas—twin
Alfred—nobly bright	Timothy—honoured by God (Lat.)
Alfred—nobly bright	Victor—conqueror (Lat.)
Alfred—nobly bright	Vincent—conquering (Lat.)
Alfred—nobly bright	Vivian—lively
Alfred—nobly bright	Walter—great warrior
Alfred—nobly bright	Wilfred—great peace
Alfred—nobly bright	William—helmet of resolution



Name Plate. Fig. 1. Name plate for a town house which, by means of plain, but dignified lettering, does not detract from the beautiful design of the doorway.



Name Plate. Fig. 2. Name plate on a sign-holder for a picturesque house or Tudor cottage. The design is cut out of wrought iron plate.
Courtesy of Capt. G. C. Clark

but wooden letters may be left in the natural colour and glued and tacked to a dark stained base or the letters might be dark and the base light. Poker work and chip carving are applicable to wooden plates; stencilling and painting in colours are also employed.

A name plate may be made in wrought iron, pierced metal, and applied metal letters are other processes. For brass and copper, engraving is generally adopted. Laid letters applied on glass is another suitable

method of making a name plate, which is described in the article on Lead Art Craft.

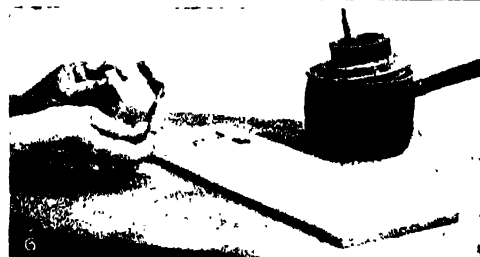
Wooden and lead letters can be obtained in various sizes. All that has to be done with these is to get a baseboard, say a piece of oak, and clean it up smooth in the vice, and mould or otherwise decorate the edges. The lettering should be set up by temporarily fixing a batten towards the lower part of the plate and placing the separate letters upon it, arranging them until the space between them is accurate and pleasing to the eye, noting each of the characters, marking their position on the baseboard, gluing and pinning if necessary. When dry, the edges of the letters can be modelled or left plain, and the back ground coloured, oiled or polished. If the name plate is not exposed to the weather, the letters could be cut from good plywood.

In making a repoussé name plate the design should be drawn and a tracing made. The latter is transferred in reverse to the back of the metal plate, which is then mounted on to a cement block and the work of embossing proceeded with. The article on Repoussé work should be referred to.

A simple way to make a name plate for a protected doorway is to braid the letters up from thin strips of wood, such as can be obtained for strip work. The lettering is marked out on the baseboard, and pieces of the wood strip cut off to the right length. These have then to be glued and pinned to the baseboard. The construction is

illustrated in Figs. 5 and 6, which show the baseboard prepared, the method of applying the letters when cut to shape, and also the building up of others. Curved or rounded letters are represented by short straight pieces, but if these are carefully cut, they have a certain quaint charm.

NANDINA. The flowering shrub *Nandina domestica* is not hardy, and therefore requires to be planted against a sunny wall, even in southern and western districts. It has large decorative leaves and blush-coloured flowers.



Name Plate. Fig. 5. Building up wooden letters on a base.
Fig. 6. Fixing the letters by means of glue.

in summer and is suited by ordinary soil.

NANKEEN. Now a yellow or drab pocketing or corset twill, nankeen was originally hand-made in China from cotton of a natural yellow colour, and was used for breeches and men's waistcoats. In order

to secure good nankeen pocketing material ask for stout double-warp twill. Nankeen is best laundered by immersing it in cold salted water for 24 hours before washing and hanging it up to dry without wringing it.



Name Plate. Fig. 3. Suitable for a small house standing back from the street, the colour contrast of the unobtrusive name plate catches the eye.



Fig. 4. Incised lettering on a wooden base forms a simple but effective name plate for the chestnut pale gateway of the cottage type of residence.

Humphrey & Vasey, Ltd.

NANKEEN LILY. This is the popular name of the beautiful hardy lily (*Lilium testaceum*) that owes its name to its nankeen-yellow flowers. See Lily.

NAP: The Game. Nap or Napoleon is a card game for any number of players, but it is best played by five or six. An ordinary pack of 52 cards is used, and the cards rank as in whist.

In the simple game of nap each player is dealt five cards, and the eldest hand has the right of first call, the call passing as usual to the left. Each player calls according to the number of tricks he can make up to five tricks, or nap. Any player who cannot beat the previous player's call says "pass." Whoever makes the highest call has the privilege of leading, and all the other players play against him. The first card led by the player making the highest call makes the trump suit. Players must follow suit if possible, but if not may trump as desired. They are not bound to try to win a trick. The winner of each trick leads for the next.

The caller is only paid for the number of tricks he declared, though he may make one or two more. Similarly, if he fails to make the number of tricks nominated, he only pays on the amount of his call. The game is usually played for money, and payment given for each trick. Thus at halfpenny nap a player will receive 1½d. from every other player for a successful call of three, and pay out 1½d. to every player if he fails to make his call. Usually, on the Napoleon call, he receives double stakes for winning, i.e. 5d. at halfpenny nap, but only pays out normal stakes, 2½d., if he loses. Often even money is paid out on this call, i.e. 3d. and 3d. respectively.

Variations of the Game. The above is the ordinary game of nap. In the first variation there is a call known as Wellington. By this call the player undertakes not only to take all five tricks but at double the usual stakes. Wellington can only be called if nap has already been called by a previous player.

An adaptation from solo whist is the call unversy, by which a player undertakes to lose all five tricks. There are of course no trumps, and the call ranks between the ordinary calls of three and four tricks, and is paid for as for a call of three.

Sir Garnet is an extra hand of five cards dealt face downwards on the table. Each player in turn has the privilege of taking the hand up and combining it with his own, throwing away the five cards he does not want, but any player who does this must declare nap.

NAP CLOTH. An old favourite for winter coats, woollen nap cloth is warm with out being unduly heavy. The nap is produced by a process of rubbing, and the motions of the rubbing surfaces control the pattern. Besides the pimple, large or small, of Peterham nap there are also wavy naps, known sometimes as Elysians or Witney naps.

The weakness of nap cloth is that the surface rubs smooth at the points of most friction, and in the cheapest qualities this defect soon appears. Nap cloths are made at widely differing prices, and the best are much the most satisfactory in the end.

NAPHTHA. The liquid product obtained by distilling wood or paraffin is known as wood naphtha or mineral naphtha. Wood naphtha has solvent properties similar to methylated spirit; it is used by French polishers as a solvent for shellac.

Mineral naphtha is not so volatile as petrol, but it possesses similar cleansing properties, and can be

employed for removing grease and oil from fabrics. Allied to it is the solvent naphtha obtained from coal tar of the gas works. This form is employed as a solvent for india-rubber and in the manufacture of rubber waterproof articles.

NAPHTHALENE. Obtained by distillation from coal tar, naphthalene is a white crystalline solid with a peculiar odour, and when cast into globular forms it is known, but not correctly, as carbon or camphor balls. It is used principally as a disinfectant and insecticide.

Placed among furs and woollen goods stored away during the summer, the odour acts as a deterrent of moths. Before storing the furs they should be enclosed in airtight bags with a few lumps of naphthalene. The odour which is communicated to the furs is removed by hanging the furs or garments in the air for some time, preferably in the sun.

NAPKIN: For the Table. The ordinary fabric for table napkins is damask linen. If a cloth is in use the napkins should match in pattern or style. Coloured damask napkins

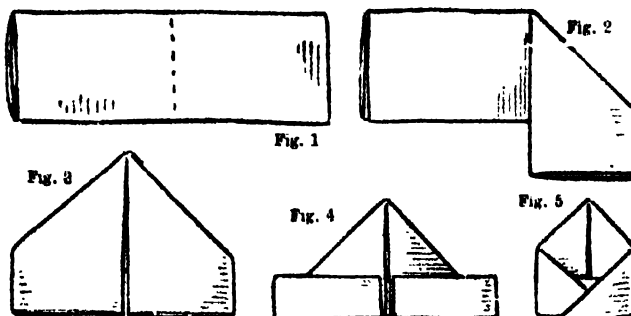
should be of good quality, because inferior weaves will not stand the frequent laundering required and are therefore not really an economy. Embroidered monograms or initials look well on good linen napkins of all kinds.

In a household the supply of napkins should be at the rate of at least four for each person with an allowance for visitors according to probable requirements. When purchasing napkins which are sometimes stocked unhemmed, these will be hemmed free of charge at a good shop, and also, in common with other house linen, will be marked free of charge.

When making dinner napkins an average size is 24 in. square; but smaller sizes may be made for breakfast or fancy napkins. Those used for afternoon tea may be 12 in. square and should be very daintily scalloped or lace edged to suit the cloth or style of the tea service. Beautiful sets can be embroidered in Renaissance or Richelieu cut work, less formal ones with cross-stitch in colours.

Paper serviettes sometimes do duty for napkins at informal meals, picnics, children's parties and in the nursery or schoolroom. Coloured

or patterned, such serviettes may be purchased in packets at most stationers. Suitable designs are obtainable for Christmas parties, and colours should be selected to enhance the bright appearance of the table and harmonize with floral decorations of the room. The advantage of paper serviettes on such occasions is that they can be thrown away after each meal and thus save laundry work. For children plain white should be an ordinary use as bright



Napkin. Method of folding to make a holder for a roll. Fig. 1. Napkin folded into three. Fig. 2. Right side folded over to centre. Fig. 3. Left side similarly turned. Fig. 4. Bottom ends folded up. Fig. 5. Shape completed by inserting bottom corners one inside the other.

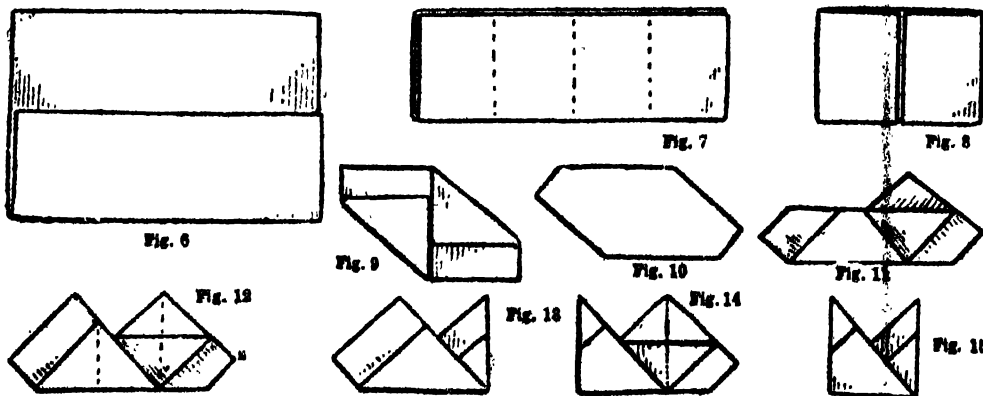
are obtainable in sets which include a tablecloth. Coloured plain linen napkins and cloths are easily made at home with hem-stitched borders. Breakfast napkins can be of checked linen or gingham, with or without a border of plain colour, to correspond with the breakfast cloth. An advantage in using the fancy style of napkins is that they are more easily laundered than damask ones, which require careful starching to bring out the glossy beauty of the fabric.

For use with decorative cloths and luncheon sets, napkins may be embroidered or lace edged to match. As a change from the more ordinary bought varieties in damask, fancy napkins made at home to suit different table sets are charming accessories to a well-laid meal. If damask napkins are bought they

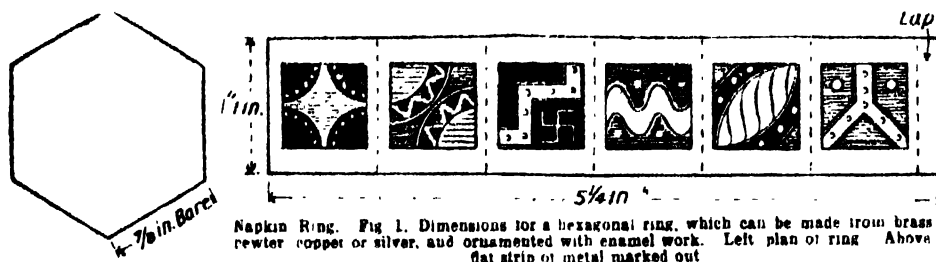
colours on paper are apt to run.

Folding Napkins. For the family table the simplest methods of folding are most suitable, and where napkins are in use for several days' meals, a ring should be provided for each person. When entertaining and embroidered or lace-trimmed napkins are in use they are merely folded flatly into neat squares or oblongs and laid for each person on the bread plate on the left to balance the glasses, or between the knives and forks. Should the hostess prefer to fold starched napkins more elaborately two methods are illustrated by diagrams.

The method of folding that produces the roll-holder seen in Fig. 5 consists in laying the napkin flat on the table and folding it carefully in three so as to make two creases. This will give the result shown in Fig. 1. Then



Napkin. Method of making the bishop style. Fig. 6. Napkin with one-third of width turned up. Fig. 7. Upper single layer folded between lower layers. Fig. 8. Three-fold length with ends touching. Fig. 9. Top right and bottom left corners turned to centre. Fig. 10. Napkin turned over. Fig. 11. Top folded over to bottom. Fig. 12. Top folded over, dotted lines showing fold to which the point B must come. Fig. 13. Point B tucked in. Fig. 14. Napkin turned over again. Fig. 15. Finished shape resulting from other point being tucked in.



Napkin Ring. Fig. 1. Dimensions for a hexagonal ring, which can be made from brass, pewter, copper or silver, and ornamented with enamel work. Left plan of ring Above flat strip of metal marked out

fold lengthwise in two so as to make a crease, and turn it back again. This crease is represented by the dotted line. From the middle, fold over the right side as seen in Fig. 2, then turn the napkin over and do the same thing on the other side. This produces Fig. 3. Turn the napkin over again, fold up the bottom ends, Fig. 4, and then complete the shape by taking the bottom corners and inserting them well into each other.

The bishop style is achieved by laying the napkin flat on the table and bringing the bottom edge up in one fold, making the size of the whole one-third less. A reference to Fig. 6 will make the process clearer. Fold the single layer of the upper part in between the two layers of the lower half, making three thick creases, as in Fig. 7, and then, by creasing over, find the centre of Fig. 7, and fold in the edges at each side to meet this line, Fig. 8.

The top right-hand corner must now be brought down, and the bottom left-hand corner up, as in Fig. 9. Turn this over and lay it on the table according to Fig. 10, and fold the top over to meet the bottom, Fig. 11. Turn this over to get Fig. 12. The dotted lines show the fold on which the right-hand part must be brought over, the angle E being tucked under the folds. This gives Fig. 13. Turn the whole over again to produce Fig. 14. Tuck in the right-hand corner of this exactly as in the last process and the finished shape, Fig. 15, will result. This must be opened out by pushing the fingers into the opening underneath. See Drawn Thread Work; Embroidery; Hemstitch; Linen; Table Laying.

Napkin Rings. The most important point about a napkin ring is that it should be individual, so that napkins shall not get mixed up when laying the table. Various devices are adopted for distinguishing rings, the simplest being to have an initial or monogram engraved, carved, or painted on them. Sometimes they are numbered, or, in the case of children, wooden rings are painted with some simple design and with the child's name in block letters. More elaborate enamelled rings may have a different design on each one of a set of rings, or they may have the same design but a different colour for the background.

Simple but pretty rings are made of strips of white linen, cut with one pointed end and just long enough to go round the napkin when rolled up. Each ring is fastened by means of a loop and button, and has a different flower, fruit or bird design embroidered on it. A tiny single hem is turned up all round and the edges are buttonholed.

Wooden rings can be obtained for enamelling or painting. Having sandpapered the ring, the selected design may be stencilled and painted in oil colours, afterwards

varnishing the ring. Bronze colours may be used or the ring may be decorated with Chinese lacquer work. Metal rings can be ornamented by piercing or by repoussé work. Instructions for carrying out these processes will be found under their own headings.

Making the Rings. A pleasing type of ring takes the form of a hexagon and can be made from brass, pewter, copper or silver. A set of such rings could be worked out using a different predominant colour for the background in each case.

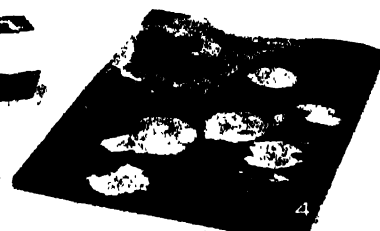
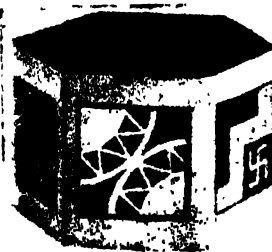
Suitable proportions are given in Fig. 1, and it will be seen that in the first stages the metal is simply a strip. It should be perfectly flat and accurately marked out where the bends are to be made.

The next stage is the bending of the strip as shown in Fig. 2, to the correct angle. This must be bent very carefully, otherwise the ring will be unequal and look very bad. A large size hexagonal nut such as is used by engineers for large-size bolts is very useful as a guide in bending to the proper angle. The two ends of the ring may either be butted, and silver soldered, or

made slightly to overlap, and then soft soldered, as in Fig. 3. Allowance for the jointing must be made when fixing the proportions of the strip.

Having soldered the joint, all six faces should be cleaned up with fine emery paper and neatly grained. Then the finest grain emery paper should be struck across the surface in one direction only until the whole exhibits a uniform surface. The next step is to decide upon a suitable design, such as that shown in Fig. 1

and carry it out with some of the specially prepared enamel as described in lacquer work on metal in page 681, or with the regulation stove enamel. The paint is applied with a very small brush in the manner illustrated in Fig. 4, and naturally calls for the greatest care if a satisfactory result is to be achieved. When this part of the work has been finished, the ring must be dipped in lacquer varnish in order to preserve it from the atmosphere. The result is seen in Fig. 5. See Embroidery Enamelling Lacquer Work; Piercing; Repoussé Work; Stencilling, etc.



NAPKIN: For the Baby. Turkish towel-ling is the best material to use for infants' napkins, owing to its absorbent quality. The squares may be bought separately or the material may be purchased by the yard and cut up and hemmed at home. See Baby.

NAPLES CAKE.

This is a mixture which is baked in six rounds, each rather less than 1 in. thick. When the layers are cooked and cold they are piled one on the top of the other, with a filling of preserve between them. The preserve must be rich and should be passed through a hair sieve, or minced nuts and whipped cream may be used as a filling.

The top of the cake is decorated with an even coating of almond icing and finished with sugar icing and a border of crystallized fruits or flowers, as shown in the illustration in the next page. For the mixture 1 lb. fine flour will be required, also 1/2 lb. butter, 1/2 lb. castor sugar, the grated rind of a lemon, one tea-spoonful orange-flower water, 7 oz. ground sweet almonds, and 1 oz. pounded bitter almonds. Rub the butter into the flour, add the other dry ingredients with a pinch of salt, mix well, and then make into a paste with the yolks of 4 eggs.

The mixture is made up into rounds and baked in a slow oven till crisp and firm and

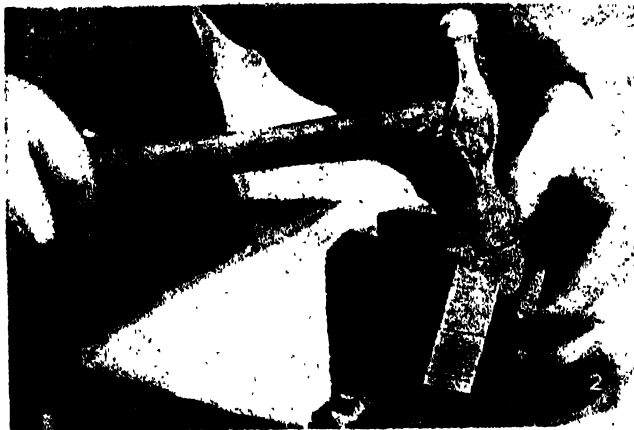


Fig. 2. Showing how to bend the metal strip on a large hexagonal nut held in the vice. Fig. 3. Soldering the ends together. Fig. 4. Application of prepared enamel with a small brush. Fig. 5. The finished ring



Naples Cake, consisting of layers of cake with fillings of preserve, the top layer being iced

about the colour of shortbread. Small flan hoops may be used to keep the rounds in shape. See Almond Paste; Jam.

NARCISSUS. This is the most popular of all the spring-flowering bulbs; there are many types or classes and numerous varieties of each type. The classification is based on the length of the cup or crown, the central part of the flower, in comparison with the outer part called the perianth.

The first class or group is the trumpet, in which the trumpet is as long as or longer than the perianth. Varieties in this group are usually called daffodils. Some of the best are King Alfred, Emperor, Empress, Horsfieldii, Glory of London and Mimi de Grief.

The second group of incomparables or chalice-cupped narcissi consists of flowers in which the cup is not less than one-third the length of the perianth. Popular varieties are Sir Watkin, Beauty, Gloria Mundi, Croesus and Golden Frilled.

In the Barn or star narcissi the cup is less than one-third as long as the perianth. Favourite varieties are Barn-conspicuous, Albatross, Red Beacon and Seagull.

The Leiden narcissi are beautiful flowers with pale perianth and cup. Mrs Langtry, Waterwitch, Duchess of Westminster and White Lady are well known varieties. Then there are the poet's narcissi, jonquils, double daffodils, and various species or wild types, among which are many charming miniatures.

In recent years innumerable new and beautiful varieties have been raised: some of them cost as much as 30 guineas a bulb. The greatest advance has been in the intense and brilliant colouring of the cup or crown, which is in striking contrast with the pale or yellow perianth. One or two new trumpet daffodils are of pale salmon colouring, and no doubt as the years pass this will be intensified.

Narcissi thrive in ordinary soil, but flourish best in that of loamy character, which does not dry out in summer. The bulbs should be planted in September-October, about 3 in. deep. They are invaluable in spring flower beds, in the herbaceous border and shrubbery, and look particularly well in grass. If grown in grass-land the grass must not be cut until the leaves have died down. Bone-meal, to the amount of 2 oz. for every square yard, is the best fertilizer to mix with the soil. The bulbs may remain undisturbed for years, until they become crowded; they ought then to be lifted in July, separated, and replanted at once or in early autumn.

In Pots and Bowls. Daffodils and narcissi make admirable pot plants for the greenhouse in early spring. The bulbs should be potted in September-October, in loamy soil, placed out of doors and covered with old sifted ashes. In six or eight weeks they will be well rooted and should be taken out, shaded for a few days and then placed under glass. After the flowers are over the bulbs may be planted out.

Narcissi and daffodils do well in bowls of fibre in the home; they should be kept in a cool, dark place for six weeks before being brought to the light. The bunch-flowered narcissi may be grown in bowls of fibre or in bowls of pebbles and water.

A few of the most beautiful of the miniature kinds, suitable for well-drained soil in the rock garden, are angel's tears daffodil (*Narcissus triandrus*), hoop potted-out daffodil (*Narcissus bulbocodium*), and *Narcissus cyclamineus*. These are also admirable bulbs to grow in pots in the unheated greenhouse.

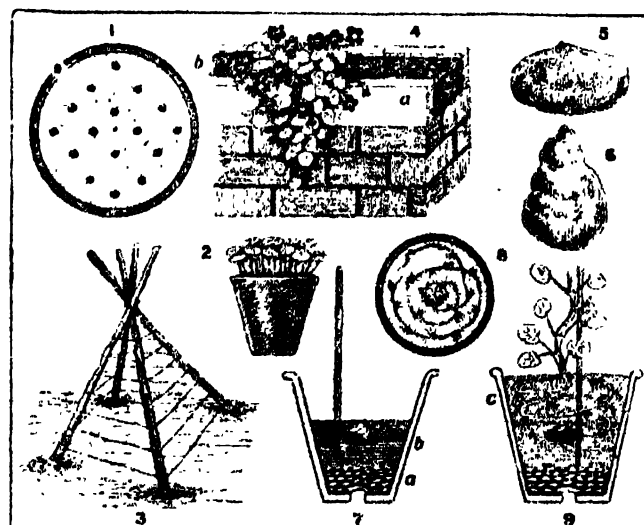
Pests of the Bulb. The chief pest is the bulb mite. The simple remedy is to dust the affected part with flowers of sulphur. To bulbs in the ground the application of a tepid solution of sulphide of potassium, 1 lb. to a quart, is recommended.

The narcissus fly sometimes affects the bulbs. The presence of the fly can be detected by pinching the neck of the bulb.

If the neck feels soft, the bulb should be cut open at the top and the eggs taken out and burnt. There is, of course, a risk that the bulb will be killed also, but this is a risk that is necessary to run for the sake of the others. It has been found by experiment that immersion of bulbs in hot water for one hour at a temperature of 110° F. is fatal to the larvae of narcissus flies. This investigation has been carried further, and developed also in the direction of seaworm control. As the latter is the more serious pest and most difficult to kill, the treatment found efficient for its eradication may be adopted as a combined measure for both seaworm and narcissus fly larvae. This consists in soaking the bulbs at a temperature of 110° F. for three hours. See Bulb, Daffodil, Flower Garden, Jonquil, etc.



Narcissus blooms of the favourite variety Barn-conspicuous



Narcissus Culture. 1. Seeds correctly sown. 2. Seedlings ready for planting out. 3. Support for climbers. 4. Planting on wall: a, Boards; b, soil. 5 and 6. Tubers of perianth (protophylls). 7. Bulb potted, allowing space for top dressing, added in 8 and 9, c.

NARTHECIUM. A hardy herbaceous, iris-like plant. *Narthecium ossifragum*, the hog asphodel, is suitable for moist soil by the side of ponds. Planting is done in spring or autumn in boggy peat, or ordinary soil mixed with sand and leaf-mould. Plants are best propagated by division in spring or autumn. *Narthecium* grows 10 in. high and bears yellow flowers during July.

NASAL CATARRH. Inflammation of the lining membrane of the nose is usually accompanied by a mucous discharge, and hence is known as catarrh. This may occur in an acute or chronic form, and be due to such irritants as dust, snuff, tobacco smoke, or other irritating vapours, or to microbe infection, the most frequent example of the latter being the common cold.

In acute cases smoking should be discontinued, the room should be kept at an even temperature, though well ventilated, while quinine and other remedies prove useful when given inwardly. A chronic nasal discharge calls for douching or spraying, and probably surgical treatment of sources of irritation within the nose. See Cold; Nose.

Nasal Douche. See Douche.

NASTURTIUM. The most important of the true nasturtiums is the watercress, but the name is commonly used to describe the annual *Tropaeolum*, of which there are both climbing and low growing varieties. The former are useful for covering trellises, fences and other supports in summer; the dwarf varieties are invaluable for poor soil and dry sunny places. Seeds are sown out of doors in April where the plants are to bloom. There are numerous varieties with blooms in yellow, orange, crimson, and other showy colours. See *Tropaeolum*; also illus. p. 831.

Uses of the Plant. Both the flowers and leaves of the nasturtium plant are used for salad making, and as a filling for sandwiches, while the seeds are pickled as a substitute for capers. The flowers, because of their bright colour, also form an excellent garnish.

Nasturtium Pickle. The seeds required for making nasturtium pickle should be gathered ripe in dry weather, as any dampness may spoil the pickle. Spread the seeds in one layer over a large dish, leave them for 1 or 2 days, and turn them about each day. Then put them into a jar and sprinkle with salt.

To prepare the pickling vinegar, simmer for 40 min. some white wine vinegar with garlic and spice, allowing 1 clove of garlic, 1 chopped shallot, and ½ oz. mixed allspice, cloves, and mace, to each quart of vinegar. The spices are tied in muslin and afterwards removed.

When the vinegar has simmered the allotted time, give it a quick boil up and pour it over the nasturtiums. Let all go quite cold before bottling the pickles, and remove the spices. Keep the pickle 4 months before using.

Nasturtium Vinegar. To make nasturtium vinegar, fill a wide-mouthed bottle with some full-blown nasturtium flowers; add ½ a clove of garlic and a finely-chopped shallot, and pour over them as much vinegar as the bottle will hold. Let the whole stand for two months before



Nasturtium. Brilliantly coloured flowers of the climbing and border plant

rubbing it through a fine sieve; then add a little cayenne pepper and salt, and keep the vinegar corked until required. See Vinegar.

NATIONALITY. In Great Britain nationality depends in the first place upon birth. A person born within the British Dominions is of British nationality, but, subject to the rule that if he be born of a father who is an alien, he can, when he is 21, or as soon thereafter as possible, renounce his British nationality and take that of his father.

In some countries a child takes the nationality of the father wherever the birth takes place, so that it is quite possible for a boy to be English by English law and German by German law. It is also possible, according to recent English decisions, for a person to have no nationality at all. If, according to the law of the state of which he was a natural citizen, he was entitled to renounce that nationality and he has renounced it, and has not acquired another nationality, then he is not a national of any country for the time being.

A woman who marries an alien does not lose her British nationality unless she acquires her husband's nationality, by his country's law, on the marriage. See Naturalization.

NATIONAL MARK. This consists of a map of England and Wales in silhouette, with the words "produce of England and Wales" inscribed in a circle placed centrally in the map within which circle is a design representing the Union Jack. Its object is to secure for home-grown meat, poultry, fruits, vegetables, eggs, canned goods, etc., the same commercial advantages as are at present enjoyed by imported supplies. Among food-stuffs to which the scheme is applied are eggs, tomatoes, apples, pears, broccoli, wheat flour, canned peas, fruits, cider, etc.

The packer is bound to state on the label of the package the variety of the article, his own name or identification mark, the grade, the date of the packing, and either the weight or the number of the contents. The advantage of this label is that it gives the purchaser all the information required, and it is not even necessary for him to see the contents of an unopened package. The scheme was temporarily suspended during the 1939-45 war.

NATIONAL SERVICE. Under the National Service Act, 1947, male British subjects ordinarily resident in the U.K. who were 18 or over and under 26 were, after Jan. 1, 1949, liable to serve in the armed forces for 12 months' whole-time service, and afterwards for 6 years' part-time service in the reserve. By an amending Act of Sept. 1, 1950, the period of full-time service was extended to two years, followed by 3½ years in the Supplementary Reserve or Territorial Army.

NATURALIZATION: The Law. Naturalization takes place where a person is made a British subject by a certificate of the home secretary. A natural-born British subject is one born within his Majesty's dominions and allegiance, one born out of British dominions, but whose father was at the time of the child's birth a British subject, either by birth or naturalization; or one born on board a British ship in foreign or territorial waters.

The child of a British subject is to be deemed to have been born within his Majesty's allegiance if born in a place where by treaty or otherwise his Majesty exercises dominion over British subjects, e.g. if born in Turkey before the abolition of the capitulations by the Treaty of Lausanne, or in one of the independent native states where the British are not subject to the local native courts. A child born on a foreign ship in British territorial waters is not born British by reason of that fact.

An alien who wishes to become naturalized must make application to the Home Office in writing, and must show that he has either resided in British dominions for not less than 5 years, or been in the service of the crown for not less than 5 years during the 8 years preceding the application. The residence required of not less than 5 years must not be less than 1 year immediately preceding the application, and 4 years in any British dominion, the whole 5 years to be within the 8 years preceding the application. The applicant must show that he is of good character, and has an adequate knowledge of the English language. Further, he must satisfy the Home Office that he intends to reside permanently in a British dominion, or else to enter or continue in the service of the crown.

Change of Nationality. When a British woman marries an alien she loses her British nationality except when the marriage does not confer on her her husband's nationality. On her husband's death or on divorce she may obtain a certificate of naturalization without any requirements as to residence; he may also dispense with the residential qualification in other special cases to the extent of not requiring that the 4 years' residence or 5 years' service shall have been within the 8 years preceding the application for naturalization.

An applicant who bases his certificate on service under the crown should procure a certificate from the department under which he served (e.g. foreign office, colonial office, etc.). The home secretary may also treat a period spent in the service of the crown abroad as equivalent to a period of residence in Great Britain. If a person applying for naturalization has minor children not British born, he may apply to have them included in the certificate. If they are so included they become British, but on attaining majority may make a declaration of alienage.

When doubts have been raised the home secretary may grant a certificate to anyone upon whose British nationality questions have arisen. This certificate must state that it is given to resolve doubts, and is not an admission by the holder of a certificate that he ever was an alien.

When the home secretary is satisfied that a certificate of naturalization has been obtained by false representations or fraud, or suppres-

sion of material facts, or that the person in question has shown himself by act or speech to be disaffected or disloyal to the crown, the certificate is to be revoked.

In addition, the certificate is to be revoked if the home secretary is satisfied that the holder has during any war unlawfully traded or communicated with the enemy, or with a subject of an enemy state, or has knowingly engaged or assisted in any business which might help the enemy. A certificate must also be revoked if it is shown that the holder was not of good character at the date of its grant, or that since the grant of the certificate he has for seven years resided out of the British dominions, except in the service of the crown or as the accredited representative of some British subject or firm. The home secretary shall also revoke the certificate where the holder within 5 years of the date thereof has been sentenced by any court in a British dominion to imprisonment for not less than 12 months, or penal servitude, or a fine of not less than £100.

The consequences of revocation are that the person becomes an alien again, and the home secretary may order that his wife and children shall also cease to be British subjects. In default of a special order the wife and children remain British. But such an order is not to be made against a woman who was by birth a British subject, unless she personally has been guilty of such conduct as would have been sufficient to justify revocation if she had held a certificate of naturalization.

NAUSEA: How to Treat. The sensation of sickness or an inclination to vomit is denoted by the term nausea; there may be retching at the same time. The most frequent causes are sea-sickness; food not easily digested or even poisonous; pregnancy (morning sickness); offensive smells or tastes; poisoning, including too freely in fermented liquors; tickling in the throat, as in chronic pharyngitis; the onset of febrile disorders; stones in the kidney; diseases of the stomach, etc. A severe knock on the head will often give rise to a feeling of sickness, and with some people any acute pain, or even excitement, may produce this effect.

The patient should lie down on his left side in a quiet room in a subdued light, with the head on a low pillow, taking care that he is comfortably warm, but not overheated. He should not be permitted to talk much or make any attempt to amuse himself by reading. Slowly sipping a glass of soda-water or other effervescent drink may help to relieve the condition. Should the feeling of nausea continue, a mustard plaster may be applied to the pit of the stomach.

If the feeling of nausea still continues, or constantly recurs, it is most important that the cause should be ascertained. If it is likely to be caused by irritants, food, or poisons in the stomach, give an emetic consisting of a tablespoonful of mustard in a glass of warm water. Afterwards give sips of cold or of soda water, though some get more benefit from sips of hot water.

If the nausea is caused by tickling in the throat, or violent coughing, a draught of cold water, if it can be swallowed, will be found helpful at the moment. A gargle should be used to tone up the throat, such as the following:

Tincture of myrrh	.. .. .	2½ drams
Glycerin of borax	.. .. .	1 oz.
Distilled water	.. .. .	8 oz.

For the feeling of nausea induced by sea-sickness it is well for the traveller to lie down, if possible, on deck, but weather will not always permit of this. He should be warmly covered with a rug. Chlorotone is often successful in preventing this complaint. As soon as he feels equal to it the patient should have a light meal, such as a basin of soup or gruel, or perhaps

some cold chicken. He should avoid any rich or greasy food. See Biliousness; Gastritis; Morning Sickness, etc.

NEAPOLITAN ICE. To make this sweet meat, beat the white of an egg and add to it a tablespoonful of water strongly flavoured with liqueur. Rub 1 lb icing sugar through a fine hair sieve, and into the white of egg, etc., stir enough of it to make a dry yet pliable mixture which can be easily moulded in the fingers. Dust a pastry board with some more icing sugar and knead the mixture on it until it is smooth. Divide it into 3 portions, colouring one with cochineal and flavouring it with raspberry essence; another with finely grated chocolate and using vanilla essence to flavour, and leaving the third portion its natural colour and using any flavouring desired.

Roll out each piece to about $\frac{1}{4}$ in. thickness, arrange the colours one on top of the other, brushing between each slab with a little cold water. Press them firmly together, trim the edges evenly, and brush over the top with a little melted coating chocolate. Let this surface dry before turning over the sweetmeat and coating the other side in the same way. Sprinkle over all a little finely desiccated coconut, and with a sharp knife cut the sweetmeat into slices or cubes. They will require about 24 hours for drying. See Chocolate.

Neapolitan Violet. This is a lovely double mauve coloured variety of the cultivated sweet violet. See Violet.

NECK: In Human Beings. It is most important that nothing tight should be worn round the neck. Giddiness is often due to this cause. Special care on this point should be taken by people who are inclined to suffer from apoplexy or any kind of fits, or those with short necks. During sleep always leave the neck as free as possible, and take especial care that in a child's night clothing the neckband is loose.

Stiff neck is a form of rheumatism of the muscles, generally caused by a chill. A person who is liable to suffer in this way should be careful never to sit in a draught. Discretion must be exercised in the use of furs, etc., round the neck, as they may make the part too warm and expose to chill later.

Glands in the Neck. In swollen glands the condition may arise from a bad cold, adenoids or diseased tonsils, bad teeth, or in young children from the cutting of teeth. A more serious cause is tubercular disease. No treatment other than the removal of the cause may be needed. The glands should be protected from irritation. When the enlargement is caused by the tubercle germ the general health should first be attended to. Do not paint the enlarged glands with iodine unless instructed to do so by the doctor, who should always supervise the treatment.

Wry neck may be an affliction from birth or have come on later. It is caused by the muscles of the neck contracting, and so drawing the head to one side. When the condition is congenital treatment by manipulation may be successful if it is commenced early enough, so no time should be lost in procuring medical advice. Fall throat results from enlargement of the thyroid gland in front of the windpipe.

Care of the Neck. The back of the neck should be protected from hot sunshine, as this part of the body is particularly sensitive and blisters are painful. Sunburn and freckles on the neck may be reduced by a bleaching lotion composed of equal parts of lemon juice, rose-water, and peroxide of hydrogen. This lotion is also helpful for removing discoloration after wearing a dark fur round the neck. Suitable emollient or astringent cosmetics should be applied, after scrubbing twice weekly with superfatted soap and a soft nail brush.

A good line of neck is best preserved by proper carriage of the head. An ugly defect

noticeable sometimes in middle age is an accumulation of fat at the back of the neck. The following exercise will help to correct this condition and restore suppleness:

Stand erect, with hands on hips. Bend head and rotate it very slowly up towards the right, then, with head back, down to the left and round. Repeat several times and then reverse the direction, keeping up on the left and down on the right. See Face; Goutte; Stiff Neck; Throat.

NECK: In Cookery. In beef that portion of the ox which lies between the head and the chuck ribs is called the neck.

In mutton the neck portion extends from the head to the loin, and is divided into the scrag, middle neck, where the shoulder has been detached, and best end of the neck. In veal, as in mutton, all meat between the head and the loin is called the neck. The scrag piece is used for boiling or stewing, and the best end can be either boiled, stewed, braised, roasted or divided into cutlets.

In pork, that part of the neck which joins the head is called the spare-rib, and can be roasted, or it is sometimes added to the head when making brawn. When cured as bacon the neck part next the head becomes the collar and is a good piece for boiling.

It must be remembered that meat is cut up differently in various parts of Great Britain and that the parts are not always named alike. See Beef; Joint; Mutton; Pork, etc.

NECKLACE. Of the expensive necklaces pearl ones are the most generally worn. Filigree necklaces and varieties of designs in enamel work, or composed of medallions or jewelled plaques are worn when fashion permits.

In choosing a necklace, whether of a valuable or inexpensive kind, regard should be paid to the shape of the neck. Women with short, thick necks should not wear large ornaments round the throat, but select a necklace which by falling well below the base of the neck has a slimming effect. A woman or girl with a thin or long neck is usually suited best by a necklace which fits the throat closely. While pearls suit nearly everyone, coloured necklaces should be chosen with due regard to the eyes of the wearer. For instance, gold and amber shades are particularly becoming to brown eyes, while jade enhances hazel eyes, and blue stones will give a deeper colour to grey or blue eyes. See Jewelry; Pearl, etc.



Nectarine. Smooth-skinned type of peach which is a delicious dessert fruit.

NECTARINE. This is a smooth-skinned type of peach, and is cultivated in exactly the same way. Some of the best varieties are Downton, Lord Napier, Early Rivers, Kilrage, and Spencer. See Peach.

NEEDLE. Needles for sewing purposes are sold cheaply in small packets and can be bought either in one particular size or in varying sizes. Needles used on damp materials should be wiped thoroughly before being put away, or they will rust and become unfit for further use. A little asbestos powder in needle packets will prevent rust. Rusty needles should be passed backwards and

forwards through an emery cushion. In warm weather this makes them easier to use if it is done occasionally while working.

The threading of a needle is facilitated by holding the eye before a sheet of paper or any white object.

Other kinds of needles used in the home include knitting needles, varieties of which are described in the article on Knitting, special packing needles, larding needles, glove needles, crochet needles, and gramophone needles.

When a splinter of a needle is broken off in the palm, the finger, or elsewhere, a doctor should be consulted at once with a view to its removal. If there is any delay the splinter may move away from its point of entry. X-rays are invaluable in localizing such fragments. It is usually necessary to open down on the needle, but this is often possible under a local anæsthetic.

Needle Case. Various kinds of needle cases are easily made, and provide a good means of saving needles which might otherwise be lost or allowed to rust. The simplest is made by sewing together in the form of a book a few small pieces of flannel cut to a uniform size. Flannel is preferable to other cloths for this purpose because, being composed of wool, it is a better preventive of rust. A small leather case to which the leaflets can be stitched, or some stiff cardboard covered with satin, makes the whole stronger and more compact. See Gramophone; Knitting; Mending; Needlework; Woolwork.

NEEDLEWORK. The art known as needlework can be summed up as a knowledge of how to make the best use of needle and thread. Under this wide term come many variations, such as tapestry, crewel, and appliqué work, other embroidery of all kinds, lace and beadwork in which a needle is used, darning, and plain sewing, as well as knitting, netting, and crochet.

Plain needlework is the first essential to learn. Besides its practical value, it teaches neatness, cleanliness in handling delicate materials, and accuracy, and gives scope for artistic expression. Those who have all their needlework done for them need a knowledge of it in order to be able to distinguish good work from bad, and those who must do their own will find a good groundwork of plain needlework helpful for everyday use, and with such a knowledge, proficiency in fancy work is more easily achieved.

Objections are raised against handwork on the ground that it is not worth while, as machines can copy most of the stitches, and that it is unhealthy work. Machine work may be a good substitute, but for fine materials it can never equal handwork, and a certain amount of the latter is always necessary.

Conditions of Work. For the sake of one's health it is important never to sit in a stooping position; see that the chair and table suit

each other in height, and hold the work so that it is only necessary to bend the head a little. When doing a piece of work that requires pinning down, such as the stroking of gathers on a large piece of work, never pin to the knee, but use a weighted cushion placed on the table, so that when pinned the work is at a convenient height for manipulation. Always sit so that the light comes over the shoulder; never work in a dim light, and avoid using black or very dark materials when working in an artificial light. Choose a steel thimble rather than a silver or bone one. The latter soon splits and silver ones wear thin quickly.

Needles, Scissors and Thread. Use rather short needles for ordinary plain sewing and longer ones for dressmaking, while darning needles should be longer still, with a long eye. The needle should be a little thicker than the working thread, so as to make a smooth passage for the latter through the material. Bent needles should not be used.

Two kinds of scissors are indispensable, a large pair with a blunt and sharp end (the latter always being kept down) for cutting out large pieces of material, and a small pair with two very sharp points for cutting fine materials and embroidery. See that the handles are large and smoothly rounded, as if they are too tight they mark the hand and hurt the thumb.

When using tacking threads keep a reel of tacking cotton, which is much cheaper than sewing cotton, and answers the purpose just as well. The most efficient work is done through the work being tacked into the correct position first sticking pins in is the lazy method except in very few instances. Do not put a long thread in the needle for ordinary sewing; about 18 in. is quite enough. For tacking, a very long thread can be used, as several stitches can be put in at once before drawing up the whole length of thread. In the case of cotton from the reel, thread the needle with the end just cut off the reel, as the opposite end is likely to be more trouble to thread through splitting. Cotton for sewing, whether from skein or reel, should always be cut, as breaking weakens it at that point. See Buttonhole Embroidery Hem Seam Tapestry.

NEEDLEWORK PICTURE. Picture-worked with the needle are rarely of earlier date than the middle of the 17th century; they bear a resemblance to tapestry on a small scale. The design is worked in silk on a brownish linen canvas in tent stitch or petit point. The costumes of the figures are easily recognizable and often date the picture.

More valuable are the examples of stump work, which is a form of raised and embossed needlework in feather stitch. A typical example of the Stuart period consists of figures of the king and queen, trees, birds, marine monsters, caterpillars, and other sub-

jects all quaintly woven together in a picture measuring, perhaps, 2 ft. by 1½ ft. The caterpillar, being an emblem of the Stuarts, gives the date to the picture which is encrusted with seed pearls, sequins, and spangles.

The stumps were followed by elaborate beadwork depicting animals, fish, trees, etc. with a landscape background. Many tent-stitch pictures of Queen Anne's reign are extant, and they show a considerable advance in workmanship. Somewhere about the close

of the 18th century Georgian black and white pictures were produced; in these a drawing was made on white satin or sarcenet, and worked upon in black silk or in colours to imitate engravings of landscapes and buildings, as well as figures. Sometimes parts of these pictures were done in Indian ink. Sampler and fire-screen work in wool came later. The technical name for needlework pictures is *sculptura*. See Embroidery, Fire Screen; Sampler, Tapestry, Woolwork.

NEGATIVES AND THEIR CARE

Some Useful Information for the Amateur Photographer

This article, which contains a section on the storing of negatives, suggests reference to other articles dealing with photography. Among such are Developing; Enlarging Film Fixing; Panchromatic; Photography; Plate; Washing.

A negative is a photographic plate which after development shows the image reversed, blacks being represented by clear spaces and high lights by dense portions, varied according to the high and low tones in the original object. When sensitive paper is placed in contact with it and exposed to light, a positive is produced showing all the tones and details of the original. Negatives may be on glass, roll films, flat films when they are thicker and stiffer than roll films, or else on paper.

It is open to the amateur to vary the quality of his negatives in the course of development according to the purpose for which the negative is required. Roughly speaking, negatives may be divided into three classes: vigorous or contrasting, normal, thin or soft. This is most satisfactorily achieved not by varying the developer, but by increasing or reducing the time of development. The amateur will always find it best to confine himself to the use of a particular developer which he knows well, and he will find that the makers of practically all the standard plates and film give development tables with several standard developers showing the time of development required for each of the three classes of negatives described.

The vigorous or contrasting negative is, roughly one which gives a brilliant print on silver paper (P.O.P.) and a very brilliant one

with sharp blacks and whites, on ordinary gaslight paper. It gives prints which are particularly suitable for reproduction by the half-tone process in newspapers or magazines. The normal negative gives good prints on either silver or gaslight paper, and, although it is not so suitable for half-tone reproduction, prints made from it are somewhat more artistic, contrasts being not so strong. The thin negative is always required when it is to be used for enlarging, unless great contrast is required; it also gives the most pleasing results in portrait work.

Defects and Stains. Defects of various kinds, chemical and physical, are liable to occur in negatives even with the careful worker. Treatment of the negatives after development, fixing, and drying are complete is always a risky matter, involving the possibility of making things worse and sometimes of ruining the negative altogether. In all photographic processes prevention is better than cure, and the amateur should take every possible care to ensure cleanliness at all stages; this cleanliness is not a mere matter of soap and water, but is a chemical question, as described under Developing, Fixing, and Washing.

Chemical dust in the dark room, caused by solutions spilled on the floor and allowed to dry, often gives rise to spots on a negative. Dust in a dark slide or in the air of the dark room when the slides are being loaded will cause pinholes on the plates.

By taking care in these and similar directions negative defects may be very largely prevented. It is not a wise plan to wipe a plate to free it from dust before placing it in the slide. The photographer can rely upon the plate being absolutely free from dust when he unpacks it from the makers, since extraordinary care is taken to prevent the deposit of dust at all stages of the manufacture. In fact, brushing the plate attracts dust to it by slightly electrifying the film. When the plate is removed from the slide after exposure it may be tapped sharply on the glass side with the knuckles to remove any dust particles that may have settled on it during exposure in the camera. This will prevent, to a large extent, the pinholes caused by dust on the plate during development.

Physical defects in a negative most often met with are frilling, blistering, small holes, pinholes due to dust, as explained above, and drying marks. The treatment of pinholes consists in filling up or spotting up the holes in the negative with Indian ink.

Small round holes larger than pinholes are due to air bubbles which have clung to the plate or film and have prevented the developer acting



Needlework picture, somewhat similar to that of the 17th century. The picture is worked in black silk on a white corded silk background, the clouds being put in with Indian ink.

at that particular spot. They are best avoided, particularly if tank development is employed, by getting rid of the air in the water. This can be achieved by boiling the water steadily for ten minutes before use and allowing it to cool undisturbed. In dish development wipe over the plates gently in the developing dish with a pad of cotton wool.

Folding, in which the edge of the film is separated from the glass, and blistering, in which the film rises in small blisters, are both due to solutions of different temperatures, and are particularly liable to occur if a somewhat warm developer is followed by a cold fixing solution. Their occurrence in hot weather may be easily avoided by the use of a combined fixing and hardening bath.

Drying marks are due to unequal drying of the negative after washing, and are very troublesome.

If a number of negatives are put in a negative rack with insufficient air space between them, particularly in damp weather, it is probable that they will be found after some hours to have dried round the edges, but still to be wet and swollen with moisture in the middle. The centre will dry if the negative is taken out of the rack, but will show a permanent mark or line round the part that was dried last. Re-soaking the negative for an hour or more in water that is not too cold, i.e. about 60 degrees, and drying with the negative stood on edge in a place where air has free access, will sometimes remove or reduce the mark. Generally it cannot be so cured. It is best prevented by seeing that air has free access to the negative when drying and avoiding the use of racks in which negatives are not well spaced out.

Chemical defects, i.e. stains, are largely due to lack of cleanliness in the various processes as already explained. Stains may also arise from specific chemical causes. Contact of a negative with sensitive paper in the presence of moisture will cause silver stains, which, if large, may be reduced by careful rubbing with a pad of cotton wool and a little globe polish or finely powdered pumice, followed by a strong hypo bath. A small stain may be almost entirely got rid of by prolonged immersion in the ordinary toning and fixing solution used for silver prints.

Pyro stain can be removed if the negative is not allowed to dry after the ordinary washing, by a clearing bath made up as follows:

Alum	1 oz.
Hydrochloric acid (pure)	1 dr.
(or citric acid)	1 oz.
Water	10 oz.
or	
Hypo	1 dr.
Thiocarbamide	10 gr.
Sodium bisulphite	1 lb.
Water	1 oz.

These baths are also useful as general cleaning baths, where marks or stains cannot be removed by other methods.

Ordinarily there is no objection to pyro stain, as it improves the printing quality of the negative, unless it is very deep.

How to Store Negatives. The amateur photographer is quickly faced with the problem of storing his negatives. When the number to be kept rises above forty or fifty, some methodical arrangement becomes necessary.

Probably more damage is done to negatives in the way of scratches, finger-marks, etc., by repeated handling than by any other means.

Many devices are on the market, but it is easy to contrive an arrangement which is both less expensive and bulky than many of the commercial negative cabinets. For negatives that are not more than a quarter plate or 9 by 12 cm. in size an ordinary 6 by 4 card index box, as seen in the illustration below, supplies the best solution of the problem.



Negative Card-index box for storing negatives, each one being enclosed in a special envelope

The negatives are kept each in a negative envelope with short details and a number outside. Proper negative envelopes, or ordinary envelopes of the best quality only, should be used, as the chemical used in making cheap paper are liable to affect the negatives.

The negatives should be classified under a few general headings according to the photographer's particular interests, such as landscapes, portraits, family groups, sport, etc., devoting a box or a portion of a box to each classified heading. Under each heading the negatives are arranged in alphabetical order, with guide cards, as seen in the photograph, on the ordinary card-index system. The negatives thus supply their own index, and no other is required. In this system film and glass negatives can be kept together without harm.

Another method, where shelf room is available and a large number of negatives of larger sizes have to be stored, is to arrange them in envelopes in a numbered order, standing on edge on the shelves with partitions for every fifty negatives. Short details are noted on the flap of the envelope and a separate index is kept. A small number of negatives may be kept in their original boxes, separated by means of sheets of pure paper, with a list on the top of each box. Film negatives are much more easily stored than glass negatives. Special albums are sold for them of the correct size, consisting of transparent envelopes into which the films are slipped, space for a list of the contents of the album being provided.

NEGLIGENCE: In Law. Negligence has been defined as the doing of something which a reasonably prudent man would not do, or the omission to do something which a reasonably prudent man would do, having regard to the circumstances. In practice, the judge or jury has always to find whether the act complained of amounts to negligence; but no action will lie for damages unless the plaintiff can first establish that there was some duty cast upon the defendant to be careful.

Such a duty may arise by contract or otherwise. For example, if A engages to drive B from London to Brighton in his motor car for payment, A is clearly under a contractual duty to be careful both as to the condition of his car and as to the manner of his driving; and should any injury befall B because A drove rashly or carelessly, or because the car had not been properly overhauled for the journey, B can sue A for negligence. The duty to be careful may be a public one, e.g. it is everybody's duty to walk, ride, or drive in a public highway carefully. To rush along without any heed to the safety of others is negligence.

A duty may arise by implication. If a man invites people to come on his premises on

business common to both, e.g. a gasfitter ordered to come and mend a pipe, it is his duty to have the premises in such a state as to be reasonably safe. Invitation in this sense may be implied, for instance, a shopkeeper is said to invite people to enter his premises with a view to becoming purchasers. To a guest a man merely owes the duty not to have traps on the premises, by which is meant concealed dangers.

Negligence in Driving. The most frequent cause of action is for negligent driving by the driver of a public or private vehicle. When anyone undertakes to do anything which requires special skill or knowledge, and which may cause injury or damage when performed unskillfully or ignorantly, it is no defence to say, "I did my best," unless indeed the act was done in an emergency, as where a layman, no doctor being present, tries to help someone who appears to be in a dangerous condition, and where an unskilled person tries to mend a broken pipe because no plumber can be found, and only succeeds in making matters worse. No action can be brought for negligence unless the plaintiff has suffered injury or pecuniary loss.

The damage must not be too remote. Thus, if A is run down by B's negligent driving, and has to suffer the amputation of an arm or the loss of an eye, and A's rich uncle, who had left A all his property, alters his will and cuts A out on the ground that he will not leave his property to a fellow with only one arm and one eye, or A was to have married an heiress who jilts him because of his altered appearance, A cannot claim against B the loss of his uncle's fortune or the profitable marriage. The loss is too remote.

The damages in such a case will be loss of wages, salary, or profits of business or profession while laid up, medical expenses, expenses of convalescence, and any extra nourishment required, depreciation in the labour market, if any, compensation for pain, suffering, and disfigurement.

Other Kinds of Negligence. There are other forms of negligence that concern the household. For instance, when coal is delivered it is sometimes shot into the cellar through a shoot or hole in the pavement covered with an iron grating. There should be precautions against leaving the open shoot unguarded, and the occupier of the premises should make sure that the grating is replaced after the coal has been shot into the cellar.

Damages may be recovered where a fire that has been caused through negligence spreads to adjacent property. Thus, if a haystack takes fire and some cottages near are burned down, the owner of the haystack is liable. A tenant is responsible for the condition of the chimneys of his house; if one which has not been swept catches fire and the sparks set light to a neighbour's outhouse or other building, damages may be claimed against the tenant. Areas or cellars adjoining a street must be kept properly fenced to prevent accident, and the occupier is responsible if any person, not there with illegal intent, falls down and sustains injury through insufficient fencing. See Accidents. Landlord; Motoring.

NEGUS Wine, usually port, mixed with hot water, spiced and sugared, is known as negus. Port wine negus is made from the following recipe: Put 1 pint of port wine into a jug, into which pour the juice of a lemon, 1 lb. sugar, and a little grated nutmeg. Add 1 quart boiling water and serve when cool. Sherry negus is made the same way, and a wine glassful of noyan or maraschino often added.

NEIGHBOUR. Disputes between neighbours arise about such things as fences, overhanging trees, party walls, rights of way and water, rights of light, and rights of support.

The remedy for interference with any of these rights is by injunction and damages.

The right of support for land of one neighbour by the adjacent land of another is a natural right of property, so long as the land which claims support is in its natural state unencumbered by buildings. In other words, B must not excavate his land so near to the edge of A's as to cause the latter to fall in. If A has a building on his land and his neighbour B digs on his own land in such a way as to cause A's building to crack or fall, A may or may not have a legal remedy. He has such a remedy if his building has stood with the support of his neighbour's land for 20 years, but not otherwise, unless indeed B may have granted him by deed or sold to him for value the right of support for his building.

When two houses or more are built so that they support each other if they are built at the same time the law implies a mutual easement or right of support. If the owner of a middle house in a row wishes to pull down and rebuild, he must prop up the houses on both sides during the process.

If a neighbour's tree overhangs a man's fence, he can cut it off level with the fence, but must not pluck the apples from the overhanging boughs. If the tree is a poisonous one, and his cattle eat of it and die, the neighbour must pay their value.

A man may not take or collect upon his land anything of dangerous character which, if it breaks loose, will damage his neighbour or his neighbour's property upon penalty of being liable to pay all the damage done if the dangerous thing escapes. This not only applies to dangerous animals, but also to such things as artificial collections of water. When a man made a reservoir and it burst, he was held liable for the damage caused to his neighbour's property by the flood, though he was able to prove that he had not been guilty of any negligence, having employed skilful engineers, and supplied them with the best of material for the construction of the reservoir. See Fence Hedge Nuisance.

NEILLIA. These are spiraea-like hardy leaf-falling shrubs of which *Neillia opulifolia* is the most useful. It bears white flowers in May. A variety named *lutea*, which has yellow leaves, is ornamental. These shrubs thrive in ordinary soil and are propagated by cuttings in sandy soil in a frame in summer.

NELUMBium. This is a greenhouse aquatic perennial plant belonging to the water lily family. The rhizomes should be planted in a pool or tub of tepid water at the bottom of which a layer of loam has been placed. The chief kind is *Nelumbium speciosum*, with white, sweet-scented flowers tipped with rose.

NEMESIA. This beautiful half-hardy annual, 8-12 in. high, bears brilliantly-coloured flowers in blue, crimson, orange, yellow, rose and other colours. It is invaluable for summer flower-beds and for groups in the herbaceous border. *Blue Gem* is a particularly attractive variety. Seeds are sown under glass in March and the seedlings are planted out of doors in May.

NEMOPHILA. This pretty, low-growing blue-flowered hardy annual is easily raised in ordinary soil in a sunny border. Seeds are sown out of doors in March-April where the



Nepaul Poppy, a showy biennial for a sheltered spot in the garden

plants are to bloom in summer. A sowing may be made in September to provide spring flowers.

NEPAUL POPPY. This is the popular name of *Meconopsis nepalensis*, a lovely biennial plant which bears yellow poppy-like flowers in summer. It is raised from seeds sown in fine soil in a frame in May and the seedlings, when large enough, are planted in well drained, loamy soil in partial shade. It is a good plan to place a covering of glass over them to keep off excessive wet in winter.

NEPENTHES. Pitcher plant is the popular name of *nepenthes*, which is a very curious and interesting family of both house shrubby perennials. The different sorts have pitchers of various colours. See Pitcher Plant.

NEPETA. The favourite plant in this group is the mauve catmint (*Nepeta mussini*) which has grey leaves and bears a profusion of lavender mauve flowers in June and July. It flourishes in ordinary well drained soil and is easily propagated by cuttings in summer. The mauve catmint is a delightful flowering plant, often used as an edging; it also looks well in a wall or by the side of garden steps. The variegated ground ivy (*Nepeta glechon variegata*), with green and white leaves, is a useful carpeting plant for damp places.

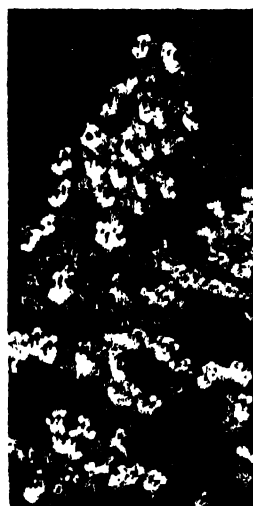
NEPHRODIUM. Many species of *nephrodium* are tropical ferns which need to be grown in a moist warm glasshouse. The commonest hardy kind is the male fern (*Nephrodium filix mas*) of which there are many beautiful named varieties; these are admirable ferns for a shady border. Leaf-mould should be added freely to the soil. Planting is best done in autumn.



Nemesis, a brilliant-colored species of a half-hardy annual which flowers all through the summer

Nerine. This is an alternative name for the bulbous flowering plant known as the Guinean lily (q.v.).

Nerium. The greenhouse evergreen flowering shrub *nerium* is better known under its popular name of oleander (q.v.).



Nepeta. The mauve catmint, a summer flowering border plant

NERTERA. The small perennial *nertera* is called *depressa* or coral-berried duckweed. Its tiny flowers are followed by round berries of reddish orange. Although the plants are of perennial character they require protection during hard weather; a suitable place to plant them being a moist and sheltered position in a shady rockery. Spring is the most suitable time for planting, and propagation is by means of division.

Nertera makes a pretty pot plant for the greenhouse.

NERVOUSNESS. The apprehensive excitable state of mind and body connoted by nervousness is a sure sign that the general health is not at its best. It may be brought about by exhausting mental work, or by some occupation which does not allow of sufficient exercise for health. Another common cause is exhausting the body by leading a dissipated life. Nervousness may be the result of a sudden shock or accident; in some cases it is inherited.

In every way a quiet, healthy life should be led. A daily cold or tepid bath must be taken in the morning, followed by a rub down with a fairly rough towel. Diet should be plain but nourishing. Tea or coffee may be taken weak and in moderation, but alcohol in all forms should be avoided. Strictly regular hours should be observed. Plenty of fresh air is another essential.

In Children. A child with any tendency to nervousness demands constant and careful watching. Treatment is on the lines described above for diet and exercise, with a warm bath at night to promote sleep. Such a child should not be left alone or forced to go to sleep in the dark. It is most important that his nurse, or whoever has charge of him, should be kind and patient but firm. He must be taught as far as possible not to give way to his temper, which will naturally often be irritable. At the same time, constant scolding and worrying over trifles likely to annoy the child must be avoided, and the person with him should be of a cheerful disposition.

Under these conditions the child may be the better for a tonic, and one likely to suit him is:

Iron and quinine citrate	..	..	..	45 gr.
Spirit of chloroform	..	..	..	40 in.
Syrup of lemon	..	..	..	25 dr.
Water to make	..	..	..	4 oz.

The dose for an eight-year-old child is a teaspoonful three times a day after meals. Nervous children sometimes develop St. Vitus's dance. See Hysteria, Neurasthenia; St. Vitus's Dance.

NET. Net is an open fabric of twine, silk, or other material, and is employed for a great number of domestic and other purposes. Nets are used for several games, e.g. lawn

tennis and table tennis, and are much employed in the garden for keeping birds away from fruit. See Badminton; Butterfly Netting; Tennis Net.

NET: The Dress Material. Nets are made chiefly in two materials, cotton and silk, cotton being most employed. They are made with both coarser and finer threads, and in meshes of different shapes and sizes. Hexagonal mesh is the most common. Meehlin is hexagonal, Lille is diamond shaped, and some are square or filet, much used in dyed shades for curtains. Network forms an integral part of the design of hand-made laces. See Filet Lace; Lace.

NET BALL. This is played with a large ball and two nets for the goals. The ball is the same as is used in Association Football. The field of play should measure 100 ft. long and 50 ft. wide, but the game can be played on a smaller piece. The usual number of players is seven a side, but this, too, can be varied.

In the centre of each end line the goals are fixed. Each goal is a single upright post, to which an iron ring, 15 in. in diameter, is fitted. This should be 10 ft. above the ground and should project 6 in. from the post. Attached to a ring is a net open at the bottom, and the ball must pass through this in order to score a goal. Around each goal a semicircle, having a radius of 16 ft., is drawn; this is known as the shooting circle. In the centre of the field is a circle 4 ft. in diameter. If a smaller field of play is used, these measurements should be reduced in proportion. The playing field is divided into three courts of equal size by lines drawn from side to side.

The seven players, in a full game, are goal scorer, attack, attacking centre, centre-defending centre, defence, and goalkeeper. The game begins with one of the two umpires bouncing the ball in the centre circle, while the players stand each party on its own side of the circle, the centres in front and the

others behind them. After one of the centres has passed the ball, the game proceeds, the aim of each player being to throw the ball to a colleague or prevent an opponent from securing it. They try to get it to the player who stands within the shooting circle, when he or she gets it, his or her aim is to throw it into the net.

As in football, there are penalties for getting offside and other offences, and the rules for throwing the ball in after it has gone out of play are very much the same as at association football. Two players of one side must not hold the ball at the same time, nor must a player carry it. Obstruction is also an offence. The penalties are a free pass or a free throw at goal.

NETTING: How to Make Netting for lawn tennis, fishing, garden purposes and hammocks is usually bought, but it can be made at home. The necessary implements consist of a piece of bone, steel, or wood, made with notched ends, called the needle (Fig. 1), and a smooth flat or round rod called the mesh or gauge.

The circumference of the mesh used controls the size of the loops, and meshes can be bought in numbered sizes. A lead-weighted heavy cushion is required, or in the case of coarse twine netting, a stirrup to slip over the left foot and provide a fixed point to pull upon may be used. To this cushion or stirrup a cord is attached to form the foundation loop; the first loop or loops of the net are cast upon this foundation. Netting consists of loops of thread called stitches, secured by knots.

The thread may be fine silk for netted purses, knitting cotton, crochet cotton, cabled twines, or tarred string. Knots of different kinds are made for different purposes; loops of different shapes and sizes can be worked into a pattern, and different colours of thread can be introduced. The work is done a row at a time, and sufficient thread for one row should be wound upon the needle at the start.

Netting stitches are oblong or square and the patterns are produced in plain netting by the different ways of passing the thread over the mesh and the manner of connecting the loops, as well as by the various sized meshes. Plain netting is given the simplest form of pattern by the last method. Two or three rows are worked over a narrow mesh, and then the same number over a coarser one, continuing the use of first one mesh and then the other at regular intervals.

Plain netting is the one to learn first. The mesh is taken in the left hand, thumb on top and fingers beneath. The mesh is held close to the foundation loop and the thread is passed over the mesh and two forefingers. The thread is brought under the mesh and placed under the thumb; then it is put round the hand and held by the little finger. The needle thus brought in front of the mesh is passed under the first loop between mesh and finger, and into the foundation loop and the thread is drawn tight close to the mesh.

The fisherman's knot is made by holding mesh and needle in the manner described, and passing the thread round the mesh but not over the fingers, then passing the needle upwards through the loop that is to be made, drawing the loop up to the mesh and holding the thread tight under the thumb. The thread is allowed to fall to the left, and the needle is put upward behind the loop and the thread is drawn tight.

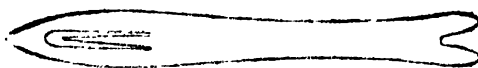
The work may be begun, with only a single loop directly attached to the foundation; or as many as 100 loops of fine silk may be cast on the foundation, as in making long netted silk purses. Steel or ivory netting needles are used for finer work of this kind. An example,

showing the stages of constructing the simplest form of wide meshed netting, is illustrated in Figs. 2 to 8. A foundation stick is used for this; in the case of fine netting, a foundation loop of coarse thread takes the place of the stick. The first stage is to wind the string on to the needle. One end of the string is looped and tied over the centre prong, as shown in Fig. 2, and the string is then turned around the needle lengthways between the jaws of the slotted end, passed over the point of the prong at the top and on alternate sides of the prong, until sufficient string has been wound. This operation is shown in Fig. 3.

The next step is to provide the foundation stick. Make a bridle of string and attach it to a nail or other convenient point of support on the wall, work bench, or any other suitable place, and attach the free end of the string to it by means of an ordinary reef knot. Then, holding the mesh stick in the left hand, pass the needle behind it, underneath and across the front of the mesh stick and on to the back of the foundation stick to the position shown in Fig. 4.

Next bring the needle with the string down over the front of the foundation stick and pass the point of the needle between the strings (Fig. 5). This forms a knot and the string is then drawn up tight, thereby bringing the mesh stick nearly into contact with the foundation stick, as in Fig. 6. The requisite number of throws are then cast in this manner on the foundation stick until the end of the stick is reached or the requisite number of casts have been made. The foundation stick is then removed, the mesh stick turned over and the finishing point made the starting-point of the next row.

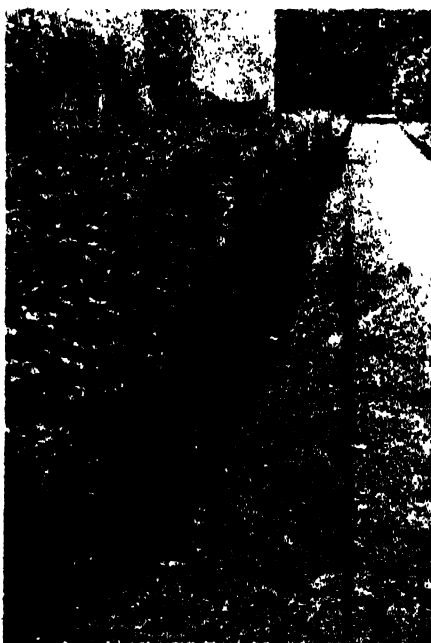
Then, holding the mesh stick in the left hand, the needle is passed over the mesh stick, behind it, and then through the first mesh of the row, as shown in Fig. 7. The thumb is then placed on the string around the mesh stick and the needle passed beneath the first mesh of the completed row, making sure that the string is tight round the mesh stick; this is accomplished by the pressure of the thumb and forefinger of the left hand, as shown in Fig. 8. The needle is then drawn right through and drawn up tightly, thus



Netting. Fig. 1. Outline of netting needle



Net ball, an outdoor game for girls. The illustration shows a shot being made for goal.



Netting a strawberry bed, showing method of supporting the mesh on stakes driven into the ground. Courtesy of Amateur Gardening.

completing the mesh. This operation is completed until the end of the row is reached, the mesh stick turned over, and the operation repeated until a sufficient size of net is completed.

For garden purposes old fish netting is useful in several ways. Generally it is used

out quite suddenly and often vanish just as quickly. They itch, sting, and burn as when one is stung by a nettle. In infants they are very common, appearing as red pimples.

In older children and adults the following causes may produce an attack: Eating shell

decayed tooth is probably the most frequent origin of the mischief. Other common causes are eyestrain, irritation in the nose or ears, and exposure to cold. In the cases of persons predisposed to neuralgia, sitting in a draught may suffice to set up a severe attack.

If the teeth are decayed, the dentist's services must be sought. If the patient is suffering from eyestrain, an oculist must be consulted. When gout, rheumatism, Bright's disease, or any other general affection is present, it must be treated appropriately at the same time that local measures are taken to relieve the pain.

Change of air is often one of the best remedies, especially in the case of nervous women. The patient must have plenty of sleep, and spend a good part of the day in the open air. The diet should be generous and contain abundance of fats, such as fat bacon, butter, and cream. When the patient is gouty, however, a strict vegetarian diet often effects a speedy cure. Neuritic patients sometimes derive much benefit from ammoniac tincture of valerian. Cod liver oil is a valuable medicine in many cases, and may be combined with malt and hypophosphites.



to cover young growing fruit trees to protect them from the ravages of birds and frost. Pockets of such netting are also useful if suspended in hammock-like fashion beneath wall and standard fruit-trees in order to catch the ripe fruit when it falls. It is likewise employed to keep off the attacks of wasps and other flying pests. See Hammock; Knot-Wire Netting.

NETTLE. The stinging nettle is one of the most difficult weeds to eradicate; the only way is continually to hoe off the tops of the plants as they push through the soil. If this is done for 2 or 3 years the plants will dwindle and perish. They can be destroyed by spraying or dusting with sodium chlorate, a highly inflammable chemical.

Uses of the Plant. The young shoots of the stinging nettle can be cooked and served in the same way as greens, but they make a more palatable dish if they are blanched first, and then cooked like spinach. Nettles are also used to make broth or vegetable soups, or added as a flavouring, but they have a bitter taste.

The traditional remedy for a nettle sting is to rub the part affected with a bruised dock leaf, and this is usually efficacious; but a better cure is to use cold water. A handkerchief should be soaked and tied over the part stung, when immediate relief will usually follow. If the sting is very severe, the bandage may be changed as soon as the cold feeling dies away. A solution of bicarbonate of soda and water is also useful. Leaves of rosemary, mint, and sage give some measure of relief.

Nettle Toast. This is a good substitute for spinach on toast. To prepare, wash and boil about 2 lb. of young nettle leaves and tops, chop them finely, and put them in a pan with 1 oz. margarine, a little lemon juice, salt and pepper. Stir these over the heat until the margarine has melted; then pile the mixture on 3 or 4 rounds of buttered toast.

NETTLERASH. This skin ailment, the medical name of which is urticaria, is characterized by whitish firm elevations or wheals surrounded by a red base. They come

fish, mushrooms, cheese, eggs, crabs, lobsters, pork, pickles, pastry, strawberries; wearing rough flannel garments next the skin; violent emotion; the irritation caused by worms in the intestine, goutiness; taking certain drugs, such as quinine, copaiba, turpentine; the use of irritating cosmetics and hair dyes; the bites and stings of wasps, bees, caterpillars, jellyfish, bugs, and lice, and contact with nettles and other stinging plants.

In treatment the cause should first be ascertained. If it is acid indigestion, a dose of 10 to 15 gr. of bicarbonate of soda in a wineglass of plain water may bring relief. If the affection is severe in children and accompanied by digestive disorders, give an emetic (q.v.), and when this has acted give one to three teaspoonfuls of castor oil. Regulate the diet, experimenting to find out the food which seems to disagree. If flannel irritates the skin, wear cotton, linen, or silk.

To relieve the itching (q.v.) many simple remedies are available, among which the following are the best: Dissolve a teaspoonful of bicarbonate of soda in a tumbler of warm water and sponge the itching part with it; apply calamine lotion with a soft sponge or piece of lint.

Young children should be prevented from scratching by sewing the sleeves of their nightdress to the body of the garment, or by loosely tying the hands to the waist.

NEURALGIA. The acute, paroxysmal pain that is usually known as neuralgia is most often felt in the head or face, though it may attack any part of the body. In neuralgia attacking the nerves of the face and head, a

There are many useful measures for the relief of pain during an acute attack. Let the patient have perfect quiet. Warmth to the affected part will frequently give relief, such as a flannel or sponge dipped in water as hot as can be borne. Dry heat is sometimes preferable. Relays of heated flannel or cotton wool may be applied, or a hot water bottle is effective.

For neuralgia in the face or head a bran poultice will often prove a good remedy. Let the patient go to bed and be warmly covered. Make a poultice of bran and put the face down on it. After using heat great care must be taken not to get fresh cold in the face. Have ready a shawl to throw over the head in passing from one room to another through a cold passage or staircase.

The number of drugs that may give relief in one case or another is considerable. If one fails, another should be tried, but always under medical direction. See Faccache; *Tic Douloureux*.

NEURASTHENIA. This term, as generally understood by the layman, refers to all those forms of nervous disorder which are functional in character such as hysteria. The medical profession, however, limit the term to a particular form of these disorders characterized by increased susceptibility to fatigue.

Neurasthenia in adolescence is often associated with the difficulties arising from

physical development. Failure on the part of parents or teachers to appreciate these difficulties and impart clean, wholesome, and truthful information on the essential facts of life often contributes to the condition. Later in life neurasthenia may result from any form of mental strain, such as overwork, anxiety, fright or shock; physical accidents, particularly in circumstances in which the individual has no time to pull himself together to meet the shock, as, for example, a railway accident, or chronic ill-health.

The most marked symptom of neurasthenia is the readiness with which the person complains of fatigue with either physical or mental effort. Other noticeable symptoms are pain or feeling of pressure in the head, pain in the back, disorders of sensation, insomnia, and indigestion. Flushing of the skin and sweating may be present, and there is often considerable loss of weight.

In adolescence treatment should be directed towards establishing a more normal and healthy frame of mind. Difficulties should be investigated and explained, care being taken that nothing is said that is calculated to reduce self-respect or increase any apprehension or feeling of guiltiness.

In older persons only palliative measures, as a rule, can be adopted. When the condition results from strain or overwork, a holiday, rest in the country, or a sea voyage may be recommended. In cases due to chronic ill-health efforts should be directed towards remedying the bodily condition which is at fault, particular attention being paid to the state of the bowels and to the condition of the teeth and of the gums. Drugs to produce sleep should be avoided if possible. Alcohol, if taken at all, should be indulged in very sparingly.

NEURITIS: Its Treatment. Inflammation of a nerve is known as neuritis, and it may be limited to one nerve, as in sciatica and inflammation of the facial nerve; when it affects a number of nerves it is termed multiple neuritis. Exposure to cold is one of the commonest causes of local neuritis.

Multiple or peripheral neuritis is the result of poison in the blood, the most common cause being the taking of alcohol continually over a long period. The symptoms are tingling in the limbs, twitching of the muscles followed by loss of muscular power, and acute pains.

Alcoholic Neuritis. This is the commonest of all the forms of multiple neuritis and arises from excessive drinking. Drinkers of spirit are more liable to develop it than those who indulge in beer or wine. The sufferers are usually those who take moderate quantities for a long period rather than those who give way to occasional excess. It is more common amongst women than men and occurs most frequently between the ages of thirty and forty.

Lead and Arsenical Poisoning. Painters, plumbers, and men employed in white-lead factories supply most of the cases of lead neuritis, but water and cider have been known to carry the poison. All parts of the system may be affected by lead, but in the majority of cases its action is confined to certain nerves of the forearm, producing wrist drop.

Habits of personal cleanliness and Government regulations of a preventive character have greatly reduced the prevalence of lead neuritis in Great Britain.

A single large dose of arsenic has been known to cause multiple neuritis, but it usually arises from the swallowing of a minute quantity frequently repeated. Weakness and wasting of the limbs are the leading symptoms, the legs being affected before the arms.

Neuritis from Germ Infection. Nearly one-quarter of the cases of diphtheria subsequently

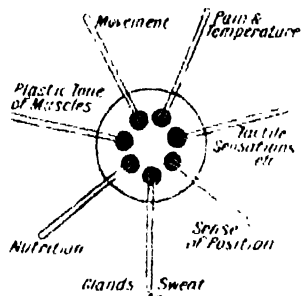
suffer from neuritis. Most are mild, symptoms being a nasal quality of the voice, a temporary dimness of vision, or a slight weakness in the hands and feet. In more severe cases the soft palate and the muscles of swallowing are attacked. The patient is liable to regurgitate liquids through the nose during swallowing, and is unable to suck, gargle or blow out the cheeks. The voice may become hoarse or even be lost. Occasionally diphtheritic neuritis attacks the nerves which regulate the heart and the diaphragm, and there is then danger to life.

The vast majority recover completely within a few weeks. The early use of antitoxin has led to a diminution in the number of cases.

For the relief of pain, nothing is better than frequent warm fomentations. After the application of these the limb should be wrapped in a thick layer of cotton wool. Occasional doses of aspirin, phenacetin or acetanilide may also be required to subdue severe spasms.

Diet should be generous, with modifications if required for gouty or diabetic cases. Abundant fresh air and sunlight should be ensured throughout this illness. Great care must be exercised to prevent the development of contractions.

Rest and warmth are essential conditions in treatment. Cover the part with a thick layer of cotton wool, and bandage it loosely. If



Neuritis. Diagram showing the various fibres entering into the composition of an ordinary nerve, and the kind of impulses that they carry upwards or downwards, and the functions disturbed in neuritis.

the arm is affected, put it in a sling. If the leg suffers, the patient must lie down.

A good deal of drugs such as those used in neuralgia may be given to relieve pains. In chronic neuritis massage and mineral baths are recommended with occasional blisters and full doses of iodide of potassium.

NEVIUSA. The deciduous flowering shrub called *neviusa alabamensis* belongs to the order of Rosaceae, and bears the popular name of Alabama snow wreath. The plant bears whitish flowers along its shoots during summer. Ordinary well-drained soil suits it. It is propagated by cuttings of half-ripe wood inserted in sandy soil under a hand-light or cold frame during the summer.

NEWEL POST. The post in which the steps of a winding stair are fitted is called a newel post. The term is also applied to the posts situated at the top and bottom of an ordinary staircase, which act as supports for the handrail.

In a small house the newel post may be made from deal about 3 in. square, and tenoned into the timber framing of the staircase, if on the upper floor. On the ground floor such a post would be similarly mortised into the floor joists and into the string of the staircase. It is often capped with a rectangular block.



Newfoundland Dog. Champion of this powerful breed of life-saving dog which excels in swimming.

In more important work the newel post may well form a prominent feature, especially when it is carved or fashioned into the pedestal for a lamp fitted with electric light or gas. An alternative is to mount a statuette on the top of the post, or to carve the head of a lion or some other animal in a conventional manner. The general character of the work should harmonize with the rest of the staircase, and be in keeping with the architecture of the home itself. See Staircase.

NEWFOUNDLAND DOG. With the St. Bernard, the Newfoundland shares the distinction of being essentially a life-saving dog. His powerful frame, deep chest, capacious ribs, broad loins and heavily-boned legs, together with his thick coat, mark him out as an ideal water dog. He can swim in almost any sea, and many stories are told of Newfoundlands that have rescued human beings.

They may be all black, or white and black, or white and bronze, the latter being popularly called Landseers, after the painter who immortalized them. The eyes should be dark brown in colour, light ones being objectionable, as they are in most breeds. The head is less massive than in that of the St. Bernard, but at the same time it should be big and broad, as befits the body. The coat is flat and dense, rather coarse in texture, and of an oily nature, so as to resist the water. The gait usually has a slight roll. A weak loin or cow hocks are most undesirable. The height of a dog is about 28 in., weight from 140 to 150 lb., bitches being 2 in. less, and weighing from 110 to 120 lb. See Dog; Kennel.

NEWMARKET. This card game, sometimes called stops, can be played by any number of persons between three and eight. Two packs are necessary, also a number of counters, which should be distributed among the players.

To begin the game, four cards are taken from one pack and are laid out upon the table. On these each player puts his stake, whatever he pleases, although sometimes a limit is agreed upon; he can put it all on one card, or divide it between two, three, or four. The cards of the other pack, having been shuffled and cut, are dealt out one by one to the players, and an extra card in every round is placed on the table. These extra cards are known as the stops.

The deal over, the player on the left of the dealer leads. He can lead any card in his hand, provided it is the lowest of the suit in question, and he continues to place cards upon it as long as he can keep up a sequence. When the sequence fails, the next player continues, and so the game goes on until the sequence is broken, because the necessary card is among the stops. The one who played the last card before the stop then leads, and so the game continues until the cards are all out. The interest of the game lies in the fact that when a player plays a card that is a duplicate of one of the four cards of the other pack, he is entitled to all the stakes that have been placed thereon. In this game the ace is counted as the lowest card.

NEW YEAR. In Scotland New Year's Day is still regarded from the popular standpoint as a more important festival than Christmas, although the latter has acquired greatly

increased importance of late years, and is almost universally celebrated exactly as in the south. The closing week of the year has thus a double significance across the Tweed, and also in a lesser degree in the north of England, where the New Year ceremonies are popular. In Scotland New Year's Day is a bank holiday.

Parties arranged for New Year's Eve usually begin at 9 o'clock, and should be so arranged that the guests are all together by a few minutes before 12. In many houses it is customary to brew punch or some other liquor, and hand it round, so that, when the clock strikes, the health of the New Year may be drunk with due honours. The darkest member of the party should slip out of the house at the crucial moment and demand entrance so that the first footing shall be lucky. After the New Year has been thus ushered in the guests, host and hostesses join hands and sing Auld Lang Syne. See Christmas, Hogmanay.

NEW ZEALAND BROOM. The broom-like half-hardy evergreen shrub, bearing the name of New Zealand broom or *Notospartium Carmichaeliae*, requires the protection of a wall, except in the warmer parts of the country. It bears pink, pea-shaped flowers during late summer. Propagate by seeds.

NEW ZEALAND FLAX. This name is given to an ornamental plant, *Phormium tenax*, a striking perennial distinguished by its long, erect, dark green leaves, about 4 ft. in height. The yellow or reddish-yellow flowers are produced in August.

This graceful plant looks well in a sheltered position near water, but it is rather tender, especially while young, and should have the rootstock protected with ashes or litter in winter. It likes a friable, sandy loam. Pro-

NEW ZEALAND SPINACH. A hardy annual plant, the New Zealand spinach is cultivated in many gardens as a substitute for summer spinach. The seeds may be sown in March in sandy soil in the heated greenhouse, and the young plants placed out-of-doors in May. Seeds may also be sown in the open ground in May if heat is not available. The tips of the shoots should be picked off frequently, whether required for cooking or not. The plants should be put out in rows about 3 ft. apart, and the leaves cut and treated in the same way as spinach (q.v.).



Nicandra. Trumpet-shaped flowers of the annual border plant sometimes known as apple of Peru.

NICANDRA. This tender border plant is sometimes called the apple of Peru. It is an annual plant, growing about 18 in. high, and bearing showy white and violet blue flowers during summer. It should be raised from seeds sown in heat during February or March, the seedlings being transplanted to boxes, hardened off, and planted out in June. See Border.

NICHE. This shallow recess in a wall can always be used to good effect in the decorative scheme of a room, hall, landing or staircase. Niches are usually either domed or rectangular, but occasionally the top is in the form of a pointed arch. A delightful adjunct for a living-room, when building, is a larger domed niche with shelves for china, flanked by two smaller rectangular niches with book-shelves, the lower part of each recess being fitted as a cupboard.

Simple decoration sets off a niche either by framing with narrow mirror glass, or wood work, or plaster ornament and moulding, using a contrasting colour for the interior of the niche to that employed for the walls or by painting a design within the niche itself as shown in the illustration. In this case recesses either side of the chimney breast have been utilized to hold decorative china, the design of the rising sun being painted in gold. A niche over a fireplace forms a pleasing alternative to the conventional overmantel, and can be either lined with mirror glass, gold or silver leaf, or merely contain some beautiful object. See Drawing Room, Recess, Shelf.

NICKEL. Nickel is a white metal which takes a brilliant polish and resists atmospheric corrosion very well. Numerous household articles made of iron or steel are often nickel plated, for instance, scissors, thumbnails, pins, pliers, and other small tools, small keys, etc. The process is used also for handle bars and other parts of bicycles, and similar metal fittings. Nickel plated articles that get rubbed in use keep themselves bright, but such as are not exposed to occasional friction get dull in time, though slowly; they may then, however, be polished in a few seconds by merely wiping

or washing off dirt and rubbing with a cloth or leather.

The nickel coating generally adheres firmly enough to stand service conditions, but it may sometimes get chipped or worn off in places, exposing an ugly black patch due to the corrosion of the underlying steel. Nothing but replating will then restore the appearance of the article. See Electroplating, Enamelling.

NICOTINE. Tobacco contains, amongst other substances, a liquid alkaloid called nicotine. The drug has been used in medicine as an antispasmodic in tetanus and strychnine poisoning, but is rarely employed. It has a marked effect in raising blood pressure, resembling adrenaline in this respect. Pipe mixtures are said to contain most, cigarettes less, and Havana cigars the least nicotine. Many, but not all, of the evil effects of smoking to excess are due to the amounts of nicotine constantly being absorbed.

This alkaloid or juice plays an important part in the colouring of pipes; but it is injurious to the tongue and throat of the smoker, and should not be allowed to accumulate in the stem, where it forms a soft, dark deposit. It may be removed with a small wire brush.

Where boiling water is available, a simple and effective method is to hold the bowl of the pipe tightly against the hot water tap, so that a strong jet of boiling water is forced through the stem and thoroughly cleanses it of the nicotine. The process is much accelerated if the mouthpiece is removed and the end of a wire covered with soap is inserted into the stem, and the soap well worked in. This absorbs or loosens the nicotine, which is then easily washed away when the pipe is held under the tap. Any ordinary wire is suitable; a wire paper clip may be straightened out and used effectively as a pipe cleaner.

Another method is to heat the wire in the fire until it is red hot, and then plunge it into



Niche in a chimney recess. It is ornamented with a design of a rising sun and contains old china.

Humphrey & John Joel



New Zealand Flax. Hardy perennial for the waterside garden, with long, erect leaves and reddish flowers.

pagation is by seed in heat in spring, or by division at that season. There are several varieties, with variegated leaves.

NEW ZEALAND HOLLY. This name is given to a group of evergreen shrubs which thrive in loamy soil and peat in a sunny position. The chief kind is *Osmanthus aquifolium*, a Japanese shrub, 5 ft. high, with holly-like leaves; it bears white flowers in winter.

the stem of the pipe. The nicotine is burnt up in this way by repeated applications of the wire, but the use of soap and boiling water is cleaner and more effective. The mouthpiece can be treated in the same manner.

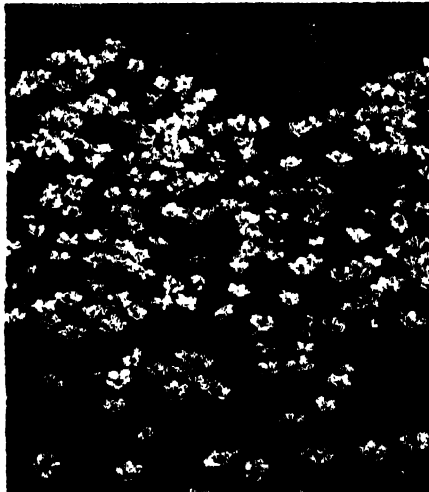
Garden Uses. Nicotine is also useful to the gardener. Nicotine soap wash, as it is called, is a very useful contact insecticide which is recommended for the destruction of apple aphid by the Ministry of Agriculture (Leaflet 106). It is made up as follows:

Nicotine (95-99 per cent) 3 oz.
Soap (soft) 4 lb.
Water (soft) 10 gal.

If the water is hard, 1 lb. of soap should be used. Dissolve the soap in hot water, dilute to the required strength, add the nicotine, and stir well. If soft soap is unobtainable, hard soap should be used instead. It will also kill apple sucker, capsid bugs, young caterpillars, and other garden pests. See Apple; Insecticide; Pipe; Smoking; Tobacco.

NIELLO. This Italian word is used for a process of decorating metal with incised designs filled with a black alloy. To some extent it resembles both inlaying and enamelling. The alloy is one of sulphur with silver, copper, or lead. Niello is used also for the piece of work decorated in this fashion, and for an impression on paper taken from the engraved and incised surface before the niello alloy has been laid therein. See Enamelling; Inlaying.

NIEREMBERGIA. The species *riveriana* is a pretty creeping plant suitable for the rock garden. It bears white-pink-tinged flowers



Nierembergia riveriana, a beautiful creeping perennial for the rock garden

and thrives in a compost of loam, leaf-mould and sand. Propagation is by division in spring. *Nierembergia frutescens* grows 18-20 in. high and bears beautiful blue flowers in summer; it is increased by cuttings which should be taken in July or August.

NIGELLA. This is the botanical name of a favourite hardy annual, love-in-a-mist, which bears blue flowers in summer. Seeds are sown out of doors in spring where the plants are to bloom.

NIGHT BLINDNESS. The condition of partial inability to see at night or at other times when the light is dim is known as nyctalopia, or night blindness. Sometimes it may be caused by the eye having been exposed to too strong a light. In most cases the abnormality is hereditary.

It may be a symptom of changes in the eye due to syphilis, when treatment for this disease will be urgently necessary. Apart from congenital cases treatment must commence with complete rest of the eyes, and it is usually necessary to improve the health by a generous diet and tonics. See Blind; Eye.

NIGHT LATCH. This is a kind of latch which can only be opened by a key on the outside, but can be opened on the inside by turning a knob with the hand. It is a very convenient form, as it enables the door to be securely fastened against anyone who is not in possession of a key. It can be obtained in either the warded or in the lever pattern, and also in the pin tumbler form.

The keys are generally small, and so are convenient for carrying in the pocket, and owing to this advantage night latches are often fitted to hall doors. The latch is fixed to the door so that the case is on the inside, while the keyhole is cut through from the outside. The care and attention which should be given to this type of latch is the same as should be given to other locks and latches, and includes periodical oiling. See Latch; Lock.

NIGHT LIGHT. Dim light used, generally in a child's bedroom, to provide some illumination after the main lighting has been turned off. The commonest form is a short paper cylinder into which melted paraffin wax or candle grease has been poured, with a wick through the centre, and standing on a tin base. When lit it is placed in a saucer of water, and it should burn for about 8 hours. There are several types of electric night light. One consists of a low-wattage lamp, generally blue, connected in the ordinary lighting circuit and controlled by a wall-switch. Another type is the normal electric lamp taking current through a switch-controlled resistance which reduces the amount of light emitted. There are also electric night lights taking current from a dry cell.

NIGHTMARE. The feeling of oppression and terror, accompanied by horrible dreams, to which the name of nightmare is given, is not uncommonly the result of some digestive disturbance. Either the evening meal has been too heavy, or something has upset the stomach. People who suffer from nightmare should take their last heavy meal not later than three hours before bedtime, and avoid all mental work, such as study or engrossing reading, for the last two hours before retiring.

The mattress should be hard and smooth. The pillow should be just thick enough to leave the neck comfortable. The bedclothes should be light. The feet must be kept warm, if necessary, by wearing socks or by the use of a hot-water bottle. The patient must not lie on his back. To prevent this, if necessary, tie a cork or large spoon over the lower part

of the back where the spine is prominent. Constipation must be prevented. When an attack of nightmare is followed by inability to sleep, a glass of warm water with a tablespoonful of whisky, or a teaspoonful of sal volatile, will often prove an effectual remedy.

Nervous and delicate children often suffer from night terrors, and will wake crying out in fear. In nervous children the injury of repeated attacks may be considerable. The trouble is often due to a badly ventilated room or the use of heavy bedclothes. A more common cause is indigestion, resulting from faulty feeding. Over-pressure at school, great excitement before bedtime, a fright, or a creepy story told to the child may sometimes give rise to one of these painful attacks.

The child should be examined by a doctor for adenoids or other affections. The bedroom should be airy, and the bedclothes light but sufficiently warm. If the child is constipated, an aperient such as castor oil, $\frac{1}{2}$ to 1 teaspoonful, should be given. The mother should see that the child has only a light supper, no pastry, meat, or anything difficult to digest. Milk and biscuits or bread and butter will generally be found the best fare for a child late at night. In some cases a small cup of beef tea given the last thing at bedtime will stop the trouble.

When the child cries out, it is generally best to go to him quickly, as the presence of a grown-up person will tend to soothe his fears. When he is quiet, give a small drink of water and change his position, and it will be found that he readily sleeps again. Never under any circumstances speak impatiently to a child who wakes in fear, as it will only increase his distress. It is a great mistake to send a child to bed in a dark room when he dreads the dark. In these cases where night terrors are troublesome a night light should be placed in such a position that it will not throw shadows on the ceilings or walls, and if possible the child should not be left alone.

NIGHT-SCENTED STOCK. This is the popular name of *Matthiola bicornis*, a hardy annual, 10 in. or so high. It bears small lilac coloured blooms which give off a delicious fragrance in the evening. Seeds are sown out of doors in spring where the plants are to bloom.

NIGHTSHADE. The deadly nightshade is *Atropa belladonna*, the berries of which are poisonous. See Atropine; Belladonna; Deadly Nightshade.

NIGHT WEAR CASES AND SACHETS

Decorative Suggestions for these Bedroom Accessories

For further helpful information the housewife is referred to the articles on Applique Work; Drawn Thread Work; Embroidery; Leather Work; Laid Work; Ribbon Work and Trimming; Richelieu Work.

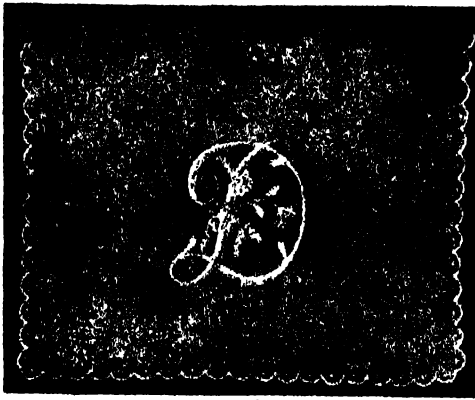
In spite of the endless choice of cases to hold nightgowns and pyjamas which can be bought at various prices in the shops—cases ranging from plain and elegant envelopes of linen to the elaborate case made in the shapes of animals—it is still pleasant and amusing, besides being very economical, to make one's own cases at home to match the furnishings of a bedroom, or to make a special case to present to a friend.

Before the work of making a nightdress case is begun, the future setting of it, and especially the bed cover, should be considered carefully. For a severely furnished room with a plain coverlet a simple case of linen decorated with broderie anglaise or edged with button-holed scalloping, and embroidered with an initial (see Fig. 1 in page 841) is most suitable. For a bedroom with prettier and softer furnishings, a nightdress case made of satin, interwoven ribbons or georgette, or a silk padded case scented with lavender or pot pourri would be more fitting.

Simple Cases. To make the simplest kind of nightgown case, half a yard of linen or artificial silk, 36 in. wide, is required. Cut out of this material a strip measuring 15 in. by 36 in., and fold it into three so that the flap and the case underneath measure 15 in. by 12 in. Sew up the sides with a single seam, the raw edges of which are afterwards bound on the inside, and neatly hem all round the flap. The edges of the flap can then be trimmed with lace or fringe, and an initial can either be transferred and then embroidered, or appliquéd to the material.

The case illustrated in Fig. 1 was made in a deep shade of lavender linen and edged with pale green scalloping and green French satin stitch spots. The initial was also embroidered in green.

When an edge is scalloped in this way, the tracing for the scalloping and the actual embroidery should be done before the case is made up, so that it is possible to seam the sides



in such a way that the case does not show beyond the scalloped edge of the flap.

The simple case can be elaborated in endless ways. Small flower groups (see article on Embroidery) can be embroidered in colour, or gay little figures or designs can be worked in cross-stitch. Fig. 2 shows a nightdress case with a slightly elaborated flap and embroidered with gaily coloured flowers. It is very fresh and charming, and washes and irons beautifully.

Transfers of various motifs suitable for night wear cases can be bought from needlework shops and from the embroidery departments of drapery stores. Some stores also sell paper patterns of easily-made plain cases which can be embroidered, drawn-thread worked, hand-painted, or otherwise decorated according to individual taste or ability.

Simple cases for pyjamas can be made from velvet, sheepskin or suede. They are cut out in the same way as the nightdress cases, and the seams are thought. The flap can either be left loose or fastened down by means of one or two press-studs (see Leather Work). Alternatively the case can be made without a flap, and the top edges closed with a lightning fastener. The front can be decorated with a stencilled or tooled design or monogram.

Amusing sachets or cases can be made of felt, with peasant figures or dancers of gaily coloured felt appliquéd on the flap, and bound with felt of a bright contrasting colour.

Noah's Ark Case. A delightful case for the pyjamas of nursery folk is illustrated in Fig. 3. It is made of linen, red for the roof, fawn or

cedar brown for the walls and bright blue for the hull. The embroidery, which is of the simplest description, is done with one skein each of red, blue, cedar, darker brown and black stranded cotton. The preliminary stitching of the edges of the various pieces must be done firmly and neatly or the case will not wash and wear well.

First cut out the linen according to the diagrams in Fig. 3. Turnings are allowed for. Tack down a neat hem all round the red roof piece, sloping sides first and then the two straight edges. Hem the tops and bottoms of the two cedar pieces, using one thread of matching stranded cotton and tack down a

under the turning, making sure they are in the centre of the hull and using three blue threads and $\frac{1}{4}$ in. long blanket stitches with $\frac{1}{4}$ in. spaces between. Blanket-stitch all round the top of the boat, thus attaching the front walls to the front of the boat and the back wall to the back of the boat. Tack the walls together at each side and blanket-stitch them together with matching cotton, using a smaller stitch and spacing.

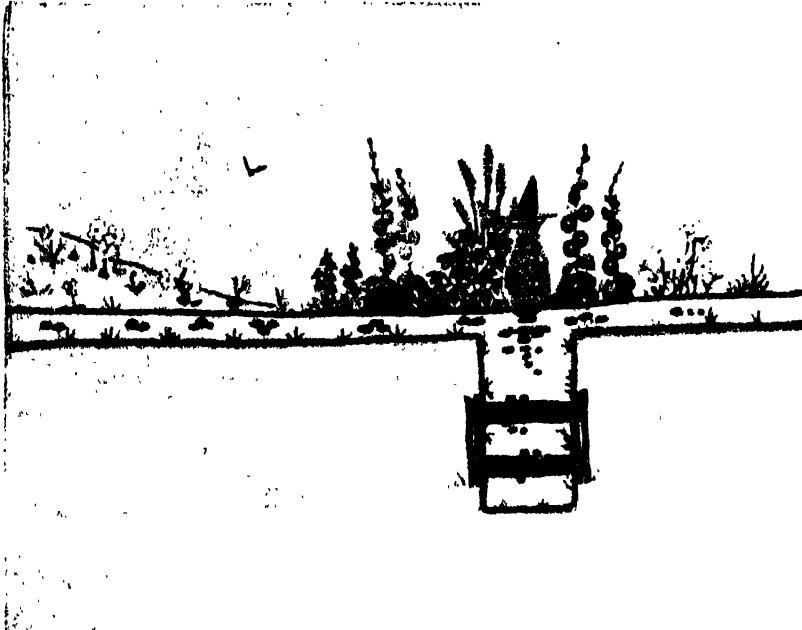
Fold the roof in half and stitch the top edges (X and Y) firmly to the top of the front wall (points A and B). Tack the lower back edge of the roof to the back wall. Now blanket-stitch in red, as before, all round the roof, fastening down the back, but leaving the front loose open. Slip-stitch together the ends of the boat projecting from the walls.

More Elaborate Sachets.

Beautiful nightdress sachets can be made from shot silk. The simplest is oblong in shape, bound with a heavy silk or tinsel cord. For this cut four pieces of taffeta: shot mauve and blue or flame and gold or whatever colouring is most suitable for the room—measuring 17 in. by 13 in. Cut two shapes of cotton wool half an inch smaller than the taffeta all round. Lay one piece of taffeta for lining on a top piece and seam all round the edges, leaving about 6 in. open. Tack a wadding shape on the lining at the extreme edge and turn them all inside out. Finish off the last 6 in. invisibly and prepare the second padded half of the sachet in the same way. Stitch the two pads together and leave one side open to slip the nightdress in. Trim with the cord and a motif of padded flowers or one in gold or silver embroidery. Such motifs can be obtained ready-made or hand-embroidered. Gold is used for a shot silk with yellow in it, silver for blue or mauve.

A pretty trimming is made by using a 2 in. wide tinsel gauze ribbon and a gold or silver lace to finish the front of the sachet. Take running-stitches along the edge of the ribbon and draw up to fit the sides of the sachet. Tack it into position round the edges and stitch a narrow tinsel lace on one side of it facing the centre of the sachet, and another on the outside of the ribbon and on the edge of the sachet. The inner lace trimming should be flat on the edge of the gauze and on the sachet and the outer lace trimming should be slightly gathered.

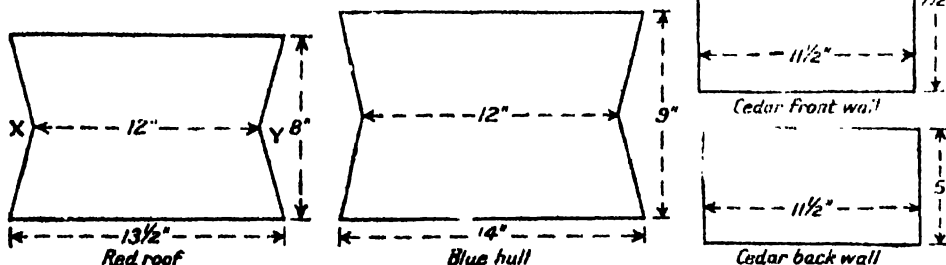
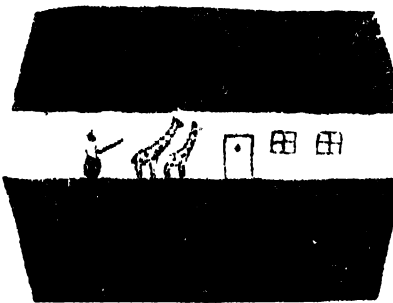
A very attractive black satin case may be made from two ovals of black satin, two of pink taffeta and two of wadding and trimmed with a basket of silk flowers in vivid colourings and with a gold insertion and lace each $\frac{1}{4}$ in. wide. First cut an oval measuring 16 in. by 19 in. deep,



Night Wear Cases. Fig. 1 (above): case made from linen, with scalloped edges and initial embroidered on flap. Fig. 2 (lower illustration): nightdress case with elaborated flap, embroidered with gaily coloured flowers.

single $\frac{1}{4}$ in. turning along the sides. Along the bottom of the front wall, having first drawn or traced the design, embroider the figures, door and windows. Fold the blue piece for the hull in half lengthwise and join the sides with French seams. Then tack down a single $\frac{1}{4}$ in. turning all round the remaining edge.

Next tack the walls into position in the hull, the hem just



Night Wear Case. Fig. 3. This Noah's Ark design in coloured linen makes a practical and amusing pyjama case for a child. The roof lifts up for the pyjamas to be put in or taken out.

Lay this pattern on double black satin and cut out two ovals, then cut out two more of the same size from rose pink taffeta and two more a trifle smaller from wadding.

On one of the black satin ovals the basket of flowers is arranged. A suitable design may be accomplished by means of applique work (q.v.) by painting on the satin, by embroidering the flowers or by making them in ribbon work (q.v.). The basket is made from five rows of the gold insertion

sewn over a piece of gold coloured satin shaped like a basket. Stitch it down on the satchet and arrange the flowers over it.

Lay a taffeta and a satin oval face to face and seam them together three-quarters of the way round. Lay a wadding oval on the taffeta one and catch it down with slip-stitches all round the edge. Turn the seamed oval right side out, and the wadding will be in its correct position between them. Finish off the last part of the seam invisibly. Seam the remaining three ovals in the same way. Slip-stitch the two padded halves together, leaving them open for about eight inches at the left-hand side. The nightdress is slipped in here.

All round the edge of the top oval, with the basket on it, stitch a strip of gold insertion $\frac{1}{2}$ in. wide, gathering it on the inner edge to fit the curve of the oval. Then, round the extreme edge of the satchet stitch a strip of gold lace about $\frac{1}{2}$ in. wide gathered slightly along the straight edge. These laces must, of course, be stitched only to the top oval where the satchet is left open at the side.

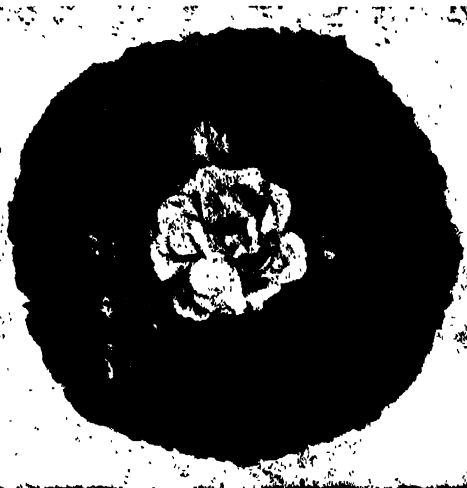
A circular satchet can be made in the same way as the oval one previously described, merely cutting out and making circular pads instead of oval ones. A pretty finish is shown in Fig. 4. This satchet is lined with pink silk and covered first in black satin, and then has a top covering of gathered black georgette. The trimming consists of a large shaded pink silk rose and green silk leaves (q.v.).

Nine Bark. This hardy deciduous shrub is known botanically as *Nerifolia* (q.v.).

NIPPLE: Its Care. That portion of a woman's breast by which milk is conveyed to the child should be prominent in the healthy, well-developed woman, and especially so during pregnancy and after childbirth. Great care should be taken that the clothing is never sufficiently tight across this part of the body to crush the nipple.

If through pressure or any other cause the nipples are not sufficiently developed for it to be easy to suckle the child, the following treatment should be carried out. During the last few weeks of pregnancy the expectant mother should gently pull out the nipples each day, using cotton wool and a little vaseline. For the last two months before the child is born bathe the nipples night and morning with eau-de-Cologne (1 part eau-de-Cologne to 3 parts of water). After bathing, dry with a soft cloth or piece of flannel.

After childbirth the nipples must be carefully attended to. They should be bathed with borax solution (a teaspoonful of boracic



Night Wear Satchet. Fig. 4. Circular satchet of gathered black georgette over black satin, trimmed with a large shaded pink silk rose

acid to the pint of water) before and after suckling, and then carefully dried with cotton wool. Should cracking or chapping take place, smear with a paste made of equal parts of bismuth carbonate and castor oil between feedings, and have a nipple shield for the child to draw the milk through.

Sometimes when the nipples are very sore it is necessary to keep the child from suckling for a few days, and then the milk must be drawn from the breast by means of a shield with tube and teat attached, or a breast pump. Sometimes while a woman is suckling her child a small abscess forms on the nipple. This should be opened by the doctor, and dressed with antiseptic lotions, etc.

Eczema of the nipple may be very troublesome. It results from neglect of cleanliness after suckling. The nipples swell, and become more or less raw. There is usually some pain and itching and the skin around the nipple may become involved. If the outbreak of eczema is severe, the child should be weaned. Bathe the parts with an alkaline lotion such as bicarbonate of soda (1 dram to $\frac{1}{2}$ pint of water), carefully dry with a piece of clean soft linen, then apply zinc ointment, lanoline cream, or the paste above mentioned, and cover with lint or linen. See Baby.

Nit. See Lice.

NITRATE: For the Garden. In gardening the term nitrate usually means nitrate of soda, though sometimes it is applied also to nitrate of potash. Nitrate of soda is a particularly good stimulant for vegetables in spring and early summer, as it helps on the growth. It should be used with care, as it promotes luxuriant leafage. A half-ounce per sq. yard is sufficient, and the same quantity dissolved in 1 gallon of water makes a good plant stimulant. Nitrate of potash (Salt-petre) used at the same rate is very stimulating; it contains 15 per cent of nitrogen and 40 per cent of potash. See Nitrogen.

NITRATE OF SILVER. Also known as lunar caustic, nitrate of silver is much used in medicine, in the form of crystals or moulded into pencils or sticks. It is largely used as a caustic for the removal of warts, proud flesh, etc. A solution forms a useful astringent spray for an inflamed pharynx or larynx, and a weaker solution may be used as a gargle. If it is desired to stop the local action of the nitrate use a little common salt. Internally it is frequently prescribed as a remedy for gastric or duodenal ulcers, diarrhoea, and chronic catarrh of the stomach.

In poisoning by nitrate of silver there is vomiting, purging, severe inflammation of stomach and intestine, and also violent pain. The treatment while awaiting the doctor consists in administering a strong solution of common salt, keeping the patient warm, and giving milk, olive oil, and soothing liquids.

NITRE: Its Household Uses. Potassium or sodium nitrate, known as nitre, is chiefly used in the household as a meat preservative, retaining the red colour of the meat better than common salt. For making a pickle for hams, a mixture of common salt 3 lb., nitre 2 lb., and boracic acid 1 lb. is usually employed.

Nitre is also a constituent of fertilizers. As an example, a mixture of equal parts of nitre and phosphate of potash is employed. One teaspoonful of this powder dissolved in a gallon of water is used for watering plants in pots, for outdoor plants the proportion is one tablespoonful to every gallon.

In medicine nitrate of potassium, also known as salt-petre, is frequently used in fever mixtures on account of its mild diuretic and diaphoretic effects. Poisoning may result from large doses, usually taken in mistake for sodium sulphate or for Epsom salts. The symptoms are vomiting, purging, with blood in the stools, suppression of urine and sometimes convulsions. While awaiting the doctor, if vomiting has not occurred it may be induced by giving an emetic, e.g. common salt, or by tickling the back of the throat. Thereafter milk and olive oil may be given, and hot poultices or fomentations applied to the abdomen to relieve pain.

Nitre Paper. The breathing in of the smoke from burning nitre papers often gives relief to people who suffer from asthma. Nitre paper may be prepared at home in the following way: Take 6 oz. of salt-petre and put in a pint of water, which should be nearly boiling. Let the salt-petre thoroughly dissolve, and then dip into the solution pieces of white blotting-paper a few inches square. Let them thoroughly soak, and then lift out and allow to dry, but not near a fire. To use them, fold like a tent, then place on a dish or in the fender, and light at the folds so that they burn slowly. Two or three may be burnt one after the other in the patient's room. See Asthma.

NITRIC ACID. Aqua fortis or nitric acid is a strong mineral acid which gives off irritant fumes when exposed to the air. It is a powerful caustic. Poisoning by nitric acid is indicated by yellow discoloration of the lips. Alkalis such as chalk, bicarbonate of soda, etc., should be administered as antidotes.

Nitric acid has many applications in industry for such purposes as the manufacture of explosives and aniline dyes.

Nitric acid is poisonous and the fumes given off are injurious to health. It should never be left loose, but kept in a well-stoppered bottle, stored in a safe place, and prominently labelled.

The use of nitric acid in the home is restricted chiefly to such operations as the etching of metals, although in the form of a salt, such as nitrate of silver, there are important applications in photography. Barium nitrate and strontium nitrate are used for the manufacture of many kinds of fireworks. When used as a very weak solution in water nitric acid forms a useful cleansing agent for badly discoloured brass, copper, and similar alloys, but the metal must be thoroughly scoured in boiling soda water immediately afterwards, as the action, unless stopped, will corrode the metal. See Caustic: Poisoning.

NITRITE OF AMYL. This chemical is given to sufferers from angina pectoris during an attack, to ease the pain and temporarily relieve the heart's condition. It is applied in small glass capsules, each wrapped in cotton or silk. When the capsule is snapped, between finger and thumb, the drug is easily inhaled. A very small quantity—perhaps one or two sniffs—is usually sufficient to end the attack. It should be noted that this is a dangerous drug and should never, in any circumstances be used without medical authority.

NITRO-CELLULOSE FINISHES. These are enamels and lacquers prepared by dissolving nitro-cellulose in special solvents and incorporating pigments to give the desired colour or tint. The drying, which is rapid, takes place by evaporation of the solvent. Cellulose finishes, as these products are usually described, are prepared specifically

for spraying or for brush application. The former class is extensively used for industrial work (e.g. in enamelling coachwork, furniture, etc.). The home worker can obtain a portable spraying outfit with "pistol," foot pump, and air reservoir, for about 50s.

Brushing finishes are obtainable in a wide range of attractive colours, and, though slower than the spray class, are comparatively rapid in drying. The technique of their application presents no difficulty. It is described in detail in the article on Enamel.

The brushes used should be rubber set ones having soft bristles, and care should be taken not to mix together the products of different makers, since the base or solvent used might be different in nature and composition. For a like reason both undercoating and finishing coat should be those of the same maker.

"The solvents employed are inflammable, and the material should not be used near a fire or any open flame. When the work is done indoors the room should be well ventilated."

THE NOAH'S ARK AND ITS CONTENTS

How to Make a Popular Nursery Toy

This work contains numerous articles dealing with children's amusements and nursery matters generally. Among them are Doll; Kaited Toys; Rocking Horse Toys. See also Nursery

Arks containing animals can be bought in a number of sizes, from small ones including only a dozen or so animals to quite large ones with two or three hundred. The animals are almost always in wood. In the larger arks they are made in pairs, each pair representing an animal or bird, with other wooden figure-representing Noah and the members of his family.

A typical ark (Fig. 1) is made with $\frac{1}{2}$ in. and $\frac{3}{4}$ in. wood. The base is $1\frac{1}{2}$ in. by $3\frac{1}{2}$ in. by $\frac{1}{2}$ in., shaped at each end and chamfered along the lower corners. The ends are 5 in. by $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. with the top corners sloped off to $3\frac{1}{2}$ in., and the sides are cut from $\frac{3}{4}$ in. wood to $8\frac{1}{2}$ in. by $3\frac{1}{2}$ in. Glue and brad the sides to the ends, and then attach in the same way to the base, leaving an equal amount at the sides and ends. The slope of the ends should be carried along the top edges of the sides with a smoothing plane. The roof is made from two pieces of $\frac{1}{2}$ in. wood, both $9\frac{1}{2}$ in. long, one $2\frac{1}{2}$ in., and the other $2\frac{1}{2}$ in. The wider piece is glued and bradded on one side, overlapping the apex of the ends by $\frac{1}{2}$ in., and the other piece is attached with two or three strips of linen or canvas, which measure about 1 in. by $\frac{1}{2}$ in.

The outside of the ark is coated with white or cream paint and the imitation timber work and windows indicated by grey and black paint. The effect may be brightened up by using red and blue if desired. A narrow slit should be made in the hinged lid and a piece of wire cut from the end of a hairpin driven in the side to project through the opening. The roof should be coated with glue, and covered with

NITROGEN: For the Garden. Nitrogen is one of the main elements of plant food, and normally plants absorb it from inorganic compounds (chiefly nitrates) present in the soil. When nitrogen is not present in sufficient quantity the plants lack vigour and the foliage and stems sometimes have a somewhat pallid appearance. This can be guarded against by applying to the soil one of the nitrogenous fertilisers, such as nitrate of soda ($\frac{1}{2}$ oz. per sq. yd.), nitrate of potash, and sulphate of ammonia (both at 1 oz. per sq. yd.). Or (separately) these can be mixed with water ($\frac{1}{2}$ oz. and 1 oz. respectively per gallon) and applied as liquid. In powder form they should be given when the soil is moist, or they should be watered in. These are for occasional use only as stimulants—not more than about four times during the actively growing season. They should not be given to obviously sickly plants or these may die outright. See Fertiliser, Nitrate, Soot.

sticky with finely granulated cork and flat particles of straw. A catch is attached to the top to fit in a loop made in the wire.

Any number of figures and animals may be placed inside. They should be cut out with a

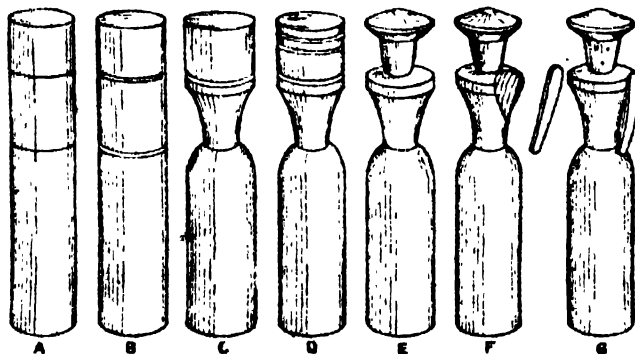


FIG. 2. Progressive stages in carving the human inhabitants of a Noah's ark

fret-saw from planed fretwood, yellow pine is best, but either whitewood or satin walnut may be used. The simplest way of making the figures is to shape them out of round wood, as in Fig. 2. Pine or deal is the easiest to cut, but whitewood is stronger. First cut off a number of lengths—about $1\frac{1}{2}$ in. from $\frac{3}{4}$ in. round, and mark off $\frac{1}{2}$ in. or so and $\frac{1}{2}$ in. above, as indicated at A. Place a knife on these marks and cut into the wood, rolling it backward and forward to form the cuts shown at B. Cut down as at C, and then make other cuts as at D, these being $\frac{1}{2}$ in. apart and hinged with a tie.

The next stage, shown at E, is done with a narrow-bladed penknife and finished quite round. This leaves the back to be cut flat, as at F. To complete the figure, the arms, $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by $\frac{1}{2}$ in., should be tapered slightly and glued on, leaving the painting to finish. Much time can be saved in making these figures by turning them on a lathe to the stage shown at E, the back, arms, and

painting only being left. The body is usually painted in one colour, the top, forming the hat, in another, and the head pale pink with the features indicated by spots of black paint.

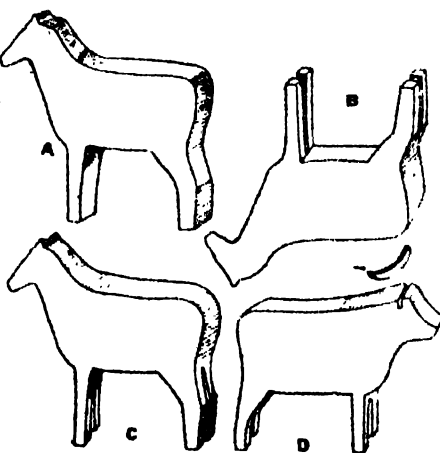
The Animals. These are drawn on the wood and cut to shape, some from $\frac{1}{2}$ in. others from $\frac{1}{4}$ in. and $\frac{3}{8}$ in. wood. Three typical examples are illustrated. The horse, cow, pig, sheep, and similar shaped animals, are made by taking the block shape as left by the fretsaw (shown in Fig. 3, A), and forming the legs by making a tenon saw cut across, as indicated at B. The ears are formed by cutting a V-shaped notch, as at C, and the horns of the cow by fitting in a shaped piece of $\frac{1}{2}$ in. wood in a saw cut made in the head as at D.

Most of the blanks, after they have been divided by the saw to form the legs, are given a slight shape by cutting off the sharp edges. Some of the animals will bear a little more modelling to give a good shape to the head, particularly with the dog, sheep, and birds. In the latter the beak should be brought to a point by cutting the wood outwards as in sharpening a pencil. It is usual to give a little shape to the sides of the birds, slightly tapering them towards the tail but keeping the latter portion full width so that it will stand properly. Both the cat and the cow are made wider at the back, this can be done before the legs are cut, but it is not difficult to cut a slice off each side when cutting the corners off. As it is usual to make the animals in pairs, time is saved in cutting out if two pieces of wood are fastened together. To prevent the saw from catching, both of the pieces should be pasted on a sheet of paper.

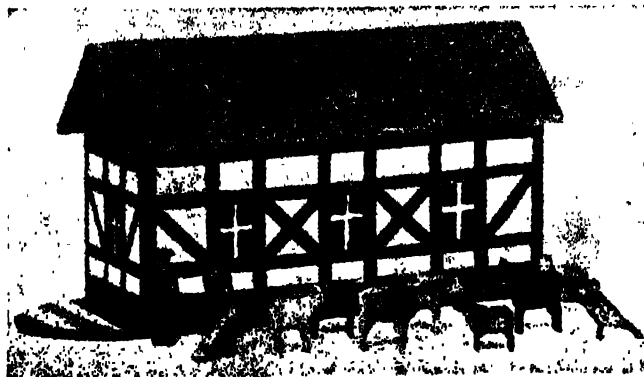
Although ordinary paint may be used for finishing the animals, it is usual to employ a spirit varnish coloured with aniline dyes. Ordinary shellac varnish is expensive for large work but a coating of size applied to the work beforehand will prevent the varnish soaking into the wood. A good var-

nish paint may be made by dissolving resin in methylated spirit and adding a little dye, but this method is not suitable for bright colours.

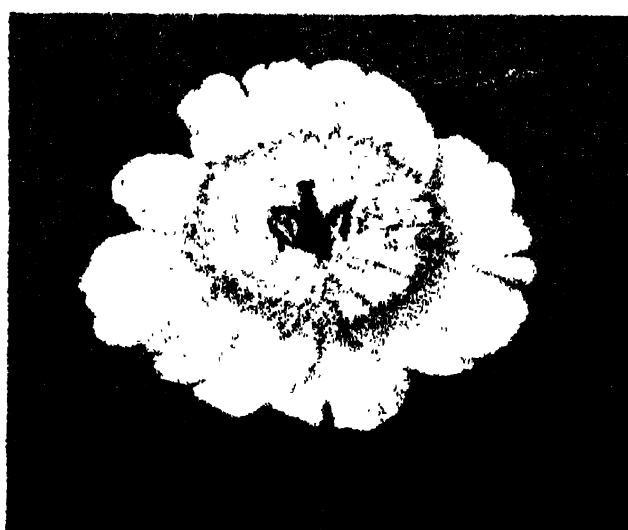
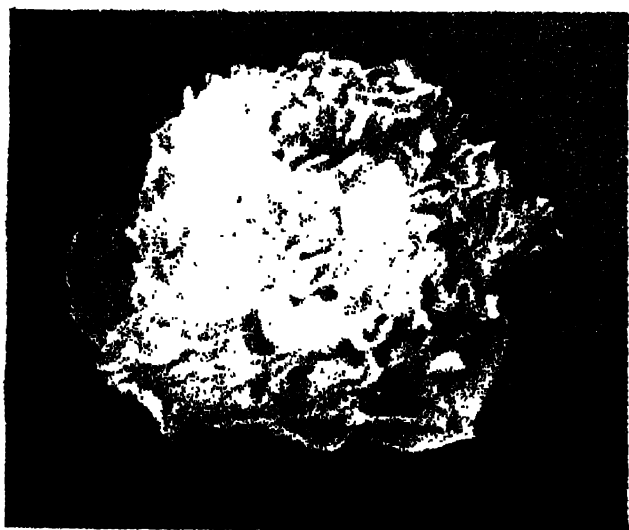
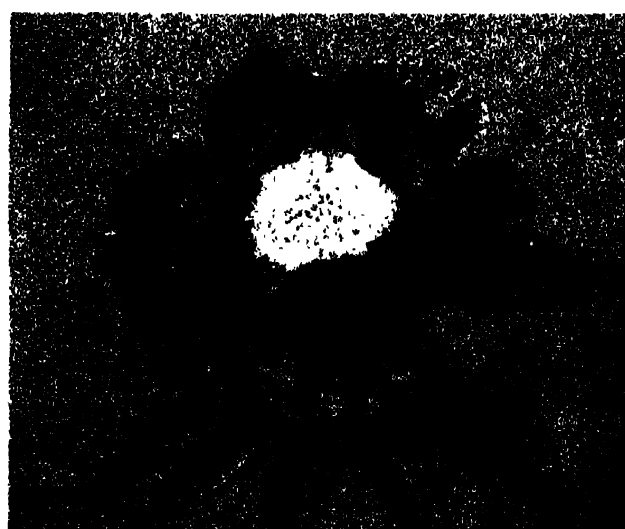
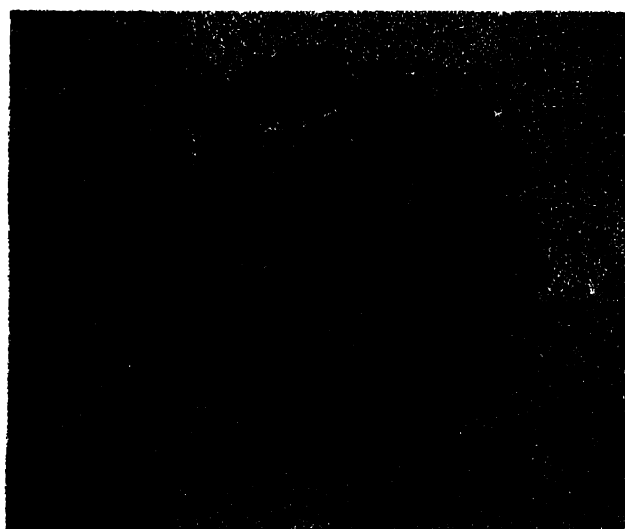
Another method of forming small animals is to cut the plain shape out of thin fretwood and form the legs with separate pieces of



Noah's Ark. FIG. 3. A, fretwood block; B, legs formed by tenon saw-cut; C, ears formed by V-shaped notch; D, use of a shaped piece of wood for horns



Noah's Ark. FIG. 1. Small Noah's ark which can be easily made by following the directions given in this article



PEONIES. COLOUR AND FORM FOR GARDEN DECORATION

One of the showiest and most satisfactory of summer flowers. Instructions for the culture of these and other varieties are given in page 617
Courtesy of Kelway & Son, Langport

and transplanted in May, or it may be sown in patches, in April, where it is to flower. *Atriplicifolia*, with blue flowers, is the chief species.

NONPAREIL.

The handsome cage bird called nonpareil is a native of warmer parts of N. America, and is about the size of the British linnet. It is kept chiefly on account of its bright plumage; the song, though soft and pleasing, being little more than a repetition of short notes, like the song of the yellowhammer.

The head and neck above are rich purple blue, the other upper parts are diversified with yellow, green, and red, and the lower parts are red. The hen bird is more soberly coloured, the upper parts green-olive and the lower parts yellow. Its natural food is seeds and insects. In the cage it should be given seeds, millet, rice, canary, and poppy, also flies and other small insects.

NOODLE or Nouille. A paste made from flour, eggs, and salt, which is known as noodle or nouille paste, may be used with equal success as a foundation for savoury dishes, a pudding, or as a garnish. It is also known as ribbon macaroni.

To make it, sift $\frac{1}{2}$ lb. flour on a pastry board, then melt $\frac{1}{2}$ teaspoonful salt in sufficient water to dissolve it. Make a well in the centre of the flour, add the salt and the yolks of 5 eggs and incorporate these ingredients, working in the flour from round the hollow first. The paste must be kneaded thoroughly and vigorously. When well worked, sprinkle it with a few drops of water, make it into a ball, roll it in a clean cloth, and let it be for an hour or two, or till wanted. If the eggs are small an extra yolk may be required, but the paste, although pliable, should be very stiff.

After standing an hour or so roll the paste very thinly and cut it into strips six to seven inches wide. Roll the strips up tightly and cut them across with a sharp knife into narrow strips about an eighth of an inch wide. Shake these out and straighten them, dredging them with a little flour. Put them into fast boiling salted water, stir them for a few minutes to keep them separated, and then boil them for 10 minutes. Lift out and drain them through a sieve or colander and put them in layers in a greased baking dish, with grated cheese between the layers. Put a good layer of grated cheese and fine breadcrumb crumbs on top, pour over a little melted margarine, and bake in a quick oven until well browned.

Noodle Dishes. A savoury dish is made by cutting the quantity of noodle paste given above into strips and parboiling them in boiling water to which salt has been added, and draining them on a sieve. Then put them into a stewpan with 3 gills strong well-flavoured chicken or veal stock, 1 oz. margarine, a little grated nutmeg, mace, pepper and salt. Place the lid on the stewpan, with a piece of grease-proof paper underneath it, set the pan on the stove over slow heat, and simmer gently until the noodles have absorbed all of the stock.

Then take it up, add a teaspoonful cream, $\frac{1}{4}$ oz. margarine, and mix these in with the contents of the pan by lifting them up with a fork and turning them over. Pile them up on a



Nolana. Blue flowers of the species *atriplicifolia*.

hot dish, scatter over a thick layer of grated cheese, and the yolk of a hard-boiled egg which has been passed through a wire sieve. Put the dish in the oven to colour the cheese, and send it to table garnished with croûtes or fried bread.

To make a sweet pudding, prepare $\frac{1}{2}$ lb. noodle paste, then lay aside $\frac{1}{4}$ of it. Treat the remainder as in the recipe for a savoury but substitute 3 gills milk for the stock and add also 2 oz. margarine, 4 oz. sugar, a pinch of salt, and flavouring of vanilla or any other essence preferred. About $\frac{1}{2}$ hour will be sufficient to allow for the pastry strips to absorb the milk. When ready mix in 4 well beaten eggs. Take the remainder of the pastry strips and coil them closely round a well-greased plain mould. Turn into the centre the prepared noodles, put the mould on a thick baking sheet and bake till it is a fawn colour. See Ravioli.

NORFOLK CAKE. To make a Norfolk cake, which is a kind of rich bread, take $\frac{1}{4}$ lb. flour and sift it into a basin with $\frac{1}{2}$ teaspoonful salt. Cream $\frac{1}{2}$ oz. (light weight) yeast with 1 teaspoonful castor sugar. Melt 6 oz. margarine in 3 gills water, and when cool mix it smoothly with the yeast. Turn the liquid into the centre of the flour, make it into a dough, and knead it thoroughly. Set it to rise covered with a cloth, and when very light make into round cakes and bake about 20 min. in a hot oven. Brush over the tops of the cakes, when baked, with milk or eggs. See Yeast.

NORFOLK DUMPLING. Norfolk dumplings can be served either with boiled meats or as a sweet with margarine and sugar, or with a sweet sauce. They should be made with about 1 lb. of very light white bread dough, and each piece of dough should weigh about $\frac{1}{4}$ oz. before it is boiled.

Make up the dumplings into smooth round balls and drop them, if to be served with meat, into the pan in which the meat is boiling about 20 min. before it is cooked. If they are intended as a sweet, drop them into a pan of fast-boiling, clear water and cook them from 15 to 20 min. When placed on the dish each should be torn apart with two forks, and a piece of margarine and sugar inserted, the halves being closed together again. Sometimes jam accompanies the dish. On no account should these dumplings be cut asunder with a knife.

As it is not always possible to be provided with yeast dough or to make it, use instead a dough made with flour, salt, baking powder, and sufficient milk or water to mix it to a stiff paste. Knead quite smooth and shape and boil as directed above. One teaspoonful baking powder should raise $\frac{1}{2}$ lb. flour. See Dough; Dumpling.

NORFOLK ISLAND PINE. This is the common name of a half-hardy tree, *Araucaria excelsa*, which in Great Britain must be grown under glass. It is familiar as a pot plant, and is much used for room and window decoration. Propagation is by cuttings in spring under glass. It should be potted in a compost of sandy loam with a little peat added.

NORFOLK LATCH. This is a form of thumb latch. It comprises three parts. One consists of a metal plate on which is fixed a handle, a hole being formed in the plate at a convenient distance above the top of the handle, through which passes the latch. The end of the latch is flattened so that the thumb can be placed upon it while the fingers grip the handle. The other parts consist of the catch and the keep, the catch being operated by the latch, while the keep engages the catch so that the door cannot be opened unless the catch is raised.

When fitted, the Norfolk latch should be so placed that the handle and latch are fixed on one side of the door, while a hole is formed through the door so that the latch can operate

the catch, which is placed on the opposite side of the door. The keep is placed on the door post to correspond with the catch. The door can be opened from both sides, from the one by depressing the latch and from the other by raising the other end. See Door; Latch.

NORFOLK PUDDING. For this pudding take $\frac{1}{2}$ lb. good cooking apples, any sort which are quick cookers will be suitable. Make a batter with 3 eggs, $\frac{1}{2}$ lb. flour, salt, and 1 pint new milk. Grease a pie dish thickly, and place in it the apples, which should have been peeled and cored. Fill the hole where the core has been with sugar, will flavoured with pounded clove or grated lemon rind. Pour over the apples the batter, and bake in a moderate oven about half an hour. Try the apples to see that they are quite cooked before removing the pudding from the oven.

NOSE. The nose consists of bone and cartilage. Two nasal bones compose the bridge, from which are continued the cartilages or movable portion of the nasal organ. The interior is divided into two portions by a partition termed the septum. From the nostrils the cavities run backwards for about 2 in. and open into the naso-pharynx.

The nasal organ is very liable to catarrhal inflammation, as in what is commonly termed a cold in the head. Adenoids tend to keep up a chronic catarrh, and boils often cause trouble.

Nose Bleeding. Bleeding of the nose, or epistaxis, may be due to such general causes as severe anaemia, scurvy, or plethora, a full-blooded condition of the head. Local causes are blows, ulcers, and picking of the nose. In cases where the bleeding is excessive any of the following measures may be used to stop it: raise the arms above the head and have someone apply cracked ice in a towel to the nose and back of the neck; or lay a cloth soaked in very cold water over the nose; inject very cold water into the nostrils; gently squeeze the nose between the finger and thumb, the patient lying down quietly. Sit on a chair with the head thrown back as far as possible and put the feet in hot water. Relief can generally be obtained by snuffing up a weak solution of alum, such as 10 gr. to 1 oz. of water.

Injuries to the Nose. Children sometimes push into the nose peas, fruit stones, buttons, or even short pencils, which lead to swelling, discharge, and bleeding. Before this foreign body has become fixed it can be treated by pressing the finger on the other side of the nose while the patient blows down forcibly. Another method is to administer snuff or



Norfolk Latch. Door in part section, showing how the latch and the catch are fitted.

tickle the nostril with a feather to induce sneezing. The nostril may be syringed gently with warm water. The mother should never attempt to remove the obstruction by pressing any instrument into the nose, as this may lead to serious damage to the organ.

Most frequently chronic redness of the nose is caused by

indigestion. Some people are particularly prone to this disfigurement, and suffer after exposure to wind or sun. The indigestion must be prevented by proper dieting. The following may be applied nightly to the nose with advantage:

Precipitated sulphur	4 dr.
Glycerin	2 "
Alcohol (90 %)	1 oz
Rose water	3 oz
Lime water	8 "

For this trouble, too, everything should be done to improve the general circulation. A daily tepid bath, followed by a brisk rub down with a rough towel, and regular brisk outdoor exercise, are two invaluable measures. A tonic such as Easton's syrup should be taken for a few weeks. For covering over the disfiguring redness, a liquid to dry on and leave a powder is sometimes to be preferred to the ordinary face powders. The following is a simple preparation of this sort:

Pure oxide of zinc	1 oz
Glycerin	1 dr.
Rose water	4 oz
Essence of rose	15 drops

Before applying, shake the bottle well, and then pour a little into a saucer and, with a fine brush, paint the liquid lightly over the nose. Then gently remove with a soft linen handkerchief any excess of the powder, and allow the remainder to dry in. See Adenoids; Blackhead; Breathing; Cold; Douche; Eustachian Tube; Nasal Catarrh.

NOSE BIT. This is a brace bit in the form of a semicircular sectioned tool with a lip at the cutting end. It is used for boring holes in wood, particularly when the hole is to be bored in the same direction as the grain of the wood, as the lip at the end of the bit enables the core of the hole to be drawn out. See Bit.

NOSING : In Woodwork. This is a term commonly applied to any projecting rounded edge. A typical example is that usually found on the tread of a step in a flight of stairs.

There is also the nosing of flat lead roofs, a roll placed on the edge of the lead flat when the sides of the roof are slated.

Other examples of nosing are found on the edges of window boards, or the projecting portions of a table. It is one of the most practical finishes, as it does not hold dust, is easily worked, and has no sharp corners to wear and give trouble.



Nosing. The use of a smoothing plane to form a plain nosing.

In working nosings the rough and ready way, which often gives excellent results, is to plane over the two corner edges at an angle of 45° and then plane off the 4 corner edges which will result from the first planing. This produces 8 flat surfaces on the edge, and it only remains to plane off these edges one into the other. Another plan is to use a hollow plane, or spokeshave, and produce the required shape by virtue of that of the outer. Generally, however, both of these implements are used after the edge has been roughly rounded. In either case, the finish should be effected with fine sandpapering.

NOTEPAPER : Its Varieties. The sizes of notepaper in most general use are Czarina (6 by 4½ in.), Octavo (7 by 4½), Viscount (6½ by 5), Imperial (7½ by 5½). Some people prefer single sheets to folded notepaper, and these are usually in sizes known as Post Octavo, Diamond, and 6th Avenue.

There are various finishes in all the qualities. The best known of these are linen finish, which is a trifle rough; white wove; and cream laid, which is smooth. Parchment is more expensive. Bond is another white, smooth finish. Vellum is not much used in notepaper as, although quite smooth, it has rather a dull appearance. Hand-made deckle-edged paper is the most expensive. Notepapers are obtainable in various shades, including mauve, yellow, orange, green and blue, in linen and smooth makes. Envelopes are sold to match, generally at the rate of 100 envelopes to 120 sheets of notepaper. Special light-weight notepaper and envelopes to match are intended for airmail.

The watermark on notepaper is a device incorporated in the texture of the paper as the maker's trade mark. It is impressed from a wire outline mounted on a roller passed over the paper during its manufacture.

The advantages in having one's address legibly displayed on all one's correspondence are obvious. The custom has been for the address to be printed or embossed in the right-hand corner of each sheet, with the telephone number in the left-hand corner, but the trend now is to have all displayed at the top centre.

NOTICE : In Law. When the occupier of a house or flat intends to leave at the expiration of his tenancy the landlord has a right to be informed in good time, so that he can arrange to find another tenant. What notice is required in a particular instance depends almost entirely on the nature of the tenancy and the terms of the agreement. An important point to bear in mind is that the notice must be given by a certain date, and failure to observe this condition will invalidate it.

When a house is taken on a three or five or seven years' lease the tenancy determines automatically when the last year has expired, and no notice is legally necessary; but if the tenant stays on without entering into any fresh agreement he becomes a yearly tenant. Six months' notice has to be given on a yearly tenancy, and it must expire on that day of the year on which the tenancy commenced. For example, if a yearly tenancy commences on June 24, notice will in that case be given on the following December quarter day, this being six months prior to the date on which the tenancy expires.

Small houses and tenements are taken by the quarter, month, or week, as the case may be, and the notice required on either side is three months, one month, or a week. Thus in the case of a weekly tenant he must give seven days' notice, expiring on the day the rent is due, usually a Saturday. Unfurnished apartments are commonly engaged for a year or for six months, and a quarter's notice is stipulated for. Furnished apartments are usually engaged by the week, and subject to a week's notice being given on either side.

Should a tenant fail to give notice at the proper time the landlord may and generally will hold him to the terms of his agreement, with the result that he becomes liable for

another quarter's rent, and so has to remain considerably longer than he had intended. He should be careful not to make any agreement, either verbal or written, in respect of any new house he intends to move into until he has given proper notice to his present landlord.

Another form of notice is that given to or by a servant. Domestic servants being almost invariably engaged and paid by the month, a month's notice on either side is the general rule. If it is desired to terminate the engagement at short notice, a month's wages must be given instead. A servant is always entitled to her proper notice unless she has been guilty of serious misconduct. See Distraint; House; Landlord; Master; Rent.

Written Notices. Even where there is a written agreement, a verbal notice is perfectly in order; but it is best to put it in writing, with date and signature. It may be delivered into the landlord's own hands or sent by registered post or delivered at the door. In the latter case the correct procedure, although it is not always done, is to keep a copy of the notice and get it signed with the date by the person who receives the original document on the landlord's behalf. These regulations were modified to a large extent by the operation of the Rent Restriction Acts.

NOTIFICATION. The occurrence in any dwelling of certain diseases must be notified to the medical officer of health as soon as the diagnosis has been made. Among the diseases to be notified are the following: smallpox, scarlet fever, cholera, diphtheria, membranous croup, erysipelas, typhus, enteric, typhoid and relapsing fever, acute primary pneumonia, acute influenzal pneumonia, tuberculosis, ophthalmia neonatorum, cerebro-spinal fever, acute poliomyelitis, acute polio-encephalitis, plague, dysentery, and if contracted in England or Wales, malaria. From time to time other diseases may be made notifiable.

In urgent cases it is customary to telephone notification of infectious diseases, so as to secure the earlier removal of the patient to an isolation hospital, but the written statutory notification should also be made at the earliest possible moment. There is a penalty for failing to notify. Legally the obligation to notify falls on the doctor, and also on the householder or person in charge of the patient, but in practice it suffices if the doctor notifies. The object is that the disease may be prevented from spreading.

When lead, phosphorous, arsenical or mercurial poisoning, or anthrax, is contracted in any factory, the fact must be at once notified to the chief inspector of factories by any medical practitioner called in to visit, or attending on the case, who believes the patient to be suffering from any such condition, unless the case has been previously notified. To the Home Office must also now be notified cases of epitheliomatous ulceration due to tar, paraffin, and similar substances, and of chronic ulceration due to chromic acid and some of its salts.

The birth of a child must be notified within 36 hours after the birth to the medical officer of health. This applies to stillborn children. In addition to this it is necessary to comply with the requirements as to the registration of births. See Birth; Death; Infectious Diseases.



Nottingham Stoneware. Mug in this form of brown glazed pottery, dating from about 1700. British Museum.

NOTTINGHAM STONWARE. This is a form of pottery made in and around Nottingham in the 17th and 18th centuries. It is a fine stoneware with a lustrous brown

glaze, and is represented to-day chiefly by jugs and pots. A good example is shown in the illustration. Nottingham ware is not unlike that known as Fulham ware, which was started by John Dwight about 1670. The Nottingham potters, who flourished in the 18th century, owed something to the influence of Dwight, and something also to the German stoneware that was imported into England in the 17th century. See Stoneware.



Two-handled pot in Nottingham Stoneware, inscribed "John Buttler and Katherine His Wife, June 11th, 1748" British Museum

NOUGAT. The blanching of 3 oz. almonds and a few pistachio nuts is the first step to be taken in making French nougat. After the skins have been removed, dry the nuts thoroughly and put them on a plate near the fire to warm. In the meantime, stir 2 oz. each honey and icing sugar, together with the whisked white of an egg and a few halved glacé cherries, in a pan over the fire, and continue stirring until they are cooked. Drop a little of the nougat into cold water when it should break evenly and be crisp.

Move the pan to the side of the heat, stir in the nuts and then turn the whole on to a slab sprinkled with icing sugar. Mould it first into the shape of a ball, and then press it into a small shallow confectionery box lined with wafer paper. Place another sheet of this on top, and then leave the nougat to get cold, when it may be cut into square or oblong shaped pieces.



Nougat, a delicious sweetmeat made with icing sugar, almond, honey, and white of egg

Another kind of nougat can be made by blanching and cutting up and then drying $\frac{1}{2}$ lb. almonds. Put $\frac{1}{2}$ lb. castor sugar and a dessertspoonful of lemon juice into a lined saucepan, stir them over gentle heat with a wooden spoon until they acquire a pale brown colour, and then add the almonds. Turn the whole on to an oiled or buttered slab, press it out with a hot, wet knife, and then mark it into squares or strips, breaking these apart when the nougat is cold.

For chocolate nougat, cook together 1 oz. each butter and grated chocolate, $\frac{1}{2}$ gill water, 1 teaspoonful glucose, and $\frac{1}{2}$ lb. sugar, and when they are dissolved boil the syrup to 240° F. Then draw the pan to the side of the heat, add 2 oz. shredded nuts and some vanilla flavouring, and stir the whole till it thickens. Let it cool in a tin lined with waxed paper.

Another variation of chocolate nougat is made by cutting the ordinary nougat into squares and dipping them in coating chocolate. See Chocolate.

NOUGATINE. To make these cakes, prepare about 6 oz. short crust pastry, and with it line some greased cake tins. Beat 2 oz. margarine and the same quantity of castor sugar to a cream, then beat in an egg, and add also 1 oz. cake or breadcrumbs, 1 oz. ground almonds, and about $\frac{1}{2}$ teaspoonful ratafia essence. Half fill each pastry case with the mixture, sprinkle the top with a few

chopped almonds, and bake the cakes in a moderate oven for about 20 min. When the cakes have cooled brush a little warmed apricot jam over them. See Pastry.

NOYAU. Noyau, or crème de Noyau, is a sweet cordial flavoured with burnt bitter almonds. See Liqueur.

NOYEAU. This is a rich, creamy sweetmeat. To make noyau with honey, dissolve $\frac{1}{2}$ lb. granulated sugar in a scant gill of water and when no grains of sugar are left whole place the pan on the heat. Just as it is on the point of boiling add 2 $\frac{1}{2}$ oz. glucose and boil till the temperature reaches 244°. Rinse out a bowl with cold water and pour the sugar into it, stir it round with a wooden spoon till creamy, and then add 2 tablespoonfuls honey, which should be liquefied by being heated over boiling water. Add also some delicate flavouring, such as orange flower water or vanilla.

The noyau must now be worked like fondant, and at the same time 3 oz. almonds, blanched, dried, and cut into halves or quarters, according to size, must be introduced and mixed in. When ready to mould the sweet should be soft and creamy, and then should be pressed into a shallow, oblong box if there is no noyau frame available. The box should be lined with wafer paper, but it is sufficient to line it with wax paper and have merely a layer of wafer paper at the bottom and on the top. The mixture should be about $\frac{1}{2}$ in. thick and quite level. Just before placing the wafer paper on the top, brush it over lightly with cold water. Weight it to keep it in place and put away the noyau in a cool place to grow firm. When set cut it into bars.

Noyeau can be made with preserve instead of honey. The jam must be pressed through a hair sieve and the colour restored with cochineal if red jam, or a little saffron colouring if yellow; jam invariably loses colour when sieved. Either apricot or raspberry jam is most suitable. Add some suitable essence, such as vanilla, orange, or almond, as well as a few drops of flavouring corresponding to the fruit of which the jam is composed.

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Doughnuts, made of short crust filled with a rich mixture and sprinkled with chopped almonds

NUISANCE. A nuisance in a public health sense means the commission of any act by the occupier of property which is either dangerous to the public health or a source of general annoyance to the community. Such things as choked drains, water closets that are out of order, or even the keeping of animals in too great numbers or in unsuitable places, are instances of the former kind, and the emission of black smoke of the latter kind. The matter can be dealt with by summons before magistrates; and sometimes the local sanitary authority can obtain a warrant to enter premises and search for and abate a nuisance found there.

Public Nuisances. A public nuisance not in a public health sense consists of the doing of some act which constitutes an interference with public rights to use what may be termed public property. Such nuisances may be restrained by injunction at the suit of the

NOVEMBER

What to do in the Garden

Flowers	Fruit	Vegetables
Plant hardy leaf losing trees and shrubs, roses and hardy herbaceous perennials.	dry. Ventilate regularly in mild weather. Bulbs of daffodil, hyacinth, and tulip may still be potted.	kept perfectly cool, no heat necessary and free ventilation is beneficial. Prune vines under glass.
Plant May flowering tulips.	Begin to prune fruit trees out of doors as soon as all the leaves have fallen.	Sow seeds of small salad crops in frames or hotbeds.
Finish planting spring bulbs, wallflower, forget-me-not, polyanthus, and other early plants.	Root prune vigorous fruit trees which do not crop well.	Give air to vegetables in cold frames whenever possible.
Dig and manure vacant ground and line the surface.	Look over trees in store and remove any which show signs of decay.	French ground for new asparagus beds.
Apply sand to lawns on heavy soil.	Plant fruit trees in deeply dug soil, using little or no manure.	Take up cuttings and store them where frost cannot get at them.
Cut down and burn the dead stems of hardy herbaceous plants.	Apply basic slag to fruit plantations, using 4 oz. per square yard of ground.	Dig and manure all vacant ground.
Burn garden refuse regularly and thus destroy many pests.	Strawberries in pots should be placed under glass to provide early fruits.	Celery should have its last earthing up.
Maintain a temperature of 50-55 degrees in the greenhouse to ensure a display of perpetual carnation, primula, etc.	Vines and peach trees under glass should be kept perfectly cool.	Lacks should be earthed up also.
Water greenhouse plants very carefully, moistening the soil only when it is moderately dry.		Leave parsnips in the ground, but take up and store full-grown carrots.

Food in Season

Fish	Game & Poultry	Fruit
Barrail; bream; brill; carp; cod; dory; eel; flounder; gurnet; haddock; hake; halibut; herring; ling; mackerel; mullet; perch; pike; plaice; salmon (Canadian); skate; smelts; soles; sprats; turbot; whiting.	Black game; capercaillie; capon; chicken; ducks; fowls; geese; grouse; hares; larks; landrails; partridges; pheasants; pigeons; quail; plover; ptarmigan; pullets; rabbits; snipe; teal; turkey; turkey poult; widgeon; woodcock.	Apples; bananas; chestnuts; cranberries; figs; filbert; grapes; lemons; medlars; melons; oranges; pears; pineapple; pomegranates; plums (California); quinces; walnuts.
Shellfish	Vegetables	
Crab; crayfish; lobster; mussels; oysters; scallops; shrimp.	Artichokes; beetroot; broccoli; Brussels sprouts; cabbage; red cabbage; carrots;	
Meat		
Beef; lamb; mutton; pork; veal; venison.		

Notes for the Month

NOVEMBER 1. - All Saints' Day. Stock Exchanges closed.
NOVEMBER 11. - Remembrance Day (Armistice Day), the Sunday before.
NOVEMBER 11, unless Nov. 11 or 12 is a Sunday.
NOVEMBER 12. - Lord Mayor's Day.
NOVEMBER 30. - St. Andrew's Day.

attorney-general. The latter is, however, as a rule, only the nominal plaintiff, merely lending his name to the real plaintiff. Instances of public nuisances are obstructions on a highway and to navigation of rivers.

Private Nuisances. Private nuisance, which gives rise to an action for damages and an injunction, consists in some interference by the defendant with the plaintiff's right of property, that is, with his enjoyment of his own property, but not amounting to trespass. Thus, to interfere with a right of way is a nuisance; so is it to block up or diminish mother's ancient lights; so also to use adjoining land or buildings in such a way as to unduly interfere with the reasonable comfort and enjoyment of his own property by a neighbour, as by setting up a noisy or evil-smelling or smoky business next door.

It must not be supposed that everything of which neighbours may complain amounts to a nuisance. For example, a man may object to a butcher's shop being set up next door to him; but so long as the butcher conducts his business properly he need take no notice of such complaints. But if the kitchen allows offensive smells to penetrate into adjoining property, a nuisance will be created for which he is liable. The principle is that every man has a right to enjoy the comfort of his house, or to conduct his business without let or hindrance, provided that he on his side does nothing that can reasonably be held to be prejudicial to his neighbours. See *Animals; Drains; Negligence; Tenant*.

NUMBER PLATE. This term is used to describe a plate which bears a number, such as may be seen attached to an entrance door or gate. It is often made in china or earthenware, with a glazed white surface bearing the number in black. Others are engraved or etched in copper or carved in hardwood.

Motor Car Plates. All mechanically-propelled vehicles must have number plates attached at the front and back in prominent positions. The plates must be rectangular, the letters and figures in line, or the letters above the figures. Each letter and figure must be $3\frac{1}{2}$ in. high and every part of it must be $\frac{1}{2}$ in. wide. The space between adjoining letters and figures must be $\frac{1}{4}$ in. A margin of $\frac{1}{2}$ in. must be left between the nearest part of any letter or figure and the top and bottom of the black surface upon which they are inscribed. When the letters are placed above the figures a space of $\frac{1}{2}$ in. must be left between the two lines, but when the identification marks are in line a gap of $1\frac{1}{2}$ in. between the last letter and the first figure is required.

The plate itself should be black, and the letters and figures painted on it with white or aluminium paint, though sometimes they are stamped on the plate, the raised marks being painted or stove enamelled. The driver must do all he can to prevent the plates from being obscured by dirt, luggage or straps, and to ensure that the rear plate is so illuminated that it can be read easily at night. If the vehicle has a luggage grid which, when down, obscures the rear number plate, a plate must be fitted to the rack. If he fails to show he has taken all reasonable steps to keep both front and rear number plates clean and clear of obstruction he will be liable to a fine not exceeding £20 for a first offence and £50 for subsequent offences.

On motor cycles the front plate can be placed parallel with the front wheel and the rear plate illuminated. The number on the plate is entered in the vehicle's registration book. The number is allotted and issued by the licensing authority, and only in exceptional circumstances can an owner choose his own number. See *Motoring*.

NUMBNESS. Generally numbness is caused by bad circulation, and often takes place in one portion of the body only, especially the fingers, which will become white and almost without feeling. Treat by rubbing gently till warmth is restored. Keep the patient in a warm room and give him hot drinks. People who suffer in this way should not use cold water to wash with, and should take great care to keep both feet and hands thoroughly warm during the winter.

Numbness may be caused by pressure on a nerve supplying the part. This sort passes off as soon as the pressure is removed. Numbness is not uncommon in hysteria, neuritis and other nervous diseases.

NUN'S VEILING. As a light, warm wool material giving good wear and less inclined to shrink than flannel this fabric is popular for babies' frocks and children's dresses. It is an excellent material for winter nightdresses. Cream nun's veiling yellowed by age can be improved by bleaching, and re-dyes well.

NUPHAR. This is a hardy aquatic plant of the water lily family. Nuphar lutea is the commonest; it bears yellow nymphaea-like flowers in summer. One better suited to small ponds is Nuphar minimum. Planting should be done in April-May; the roots are put in a basket of soil and sunk to bottom of pool.

NURSE: For Children. A nurse's work in any household consists of the care of the children, their clothes, and the rooms they use. If she is engaged as fully trained she must understand the diet suitable for varying ages and conditions, and the amount of sleep, air, and exercise necessary to health. In most households the nurse will undertake the washing of the baby clothes and the woolies of

the older children. If she is also able to make, mend, and knit, all the better. Instead of being off duty one half-day or evening a week, many children's attendants prefer to have a whole day free once a week. It makes a bigger break in the monotony of nursery routine, and as they are out of doors every day, they have plenty of exercise and fresh air. Time off during Sunday should be given as a matter of course.

An under-nurse, or nursemaid working under an experienced nurse, receives from her training in the handling of children and nursery routine. She must be healthy, willing, obedient and teachable; not too small or young, or she will be unable to do the heavier work, such as carrying coals and trays, scrubbing floors and general cleaning of the nursery. Her duties usually include the washing and dressing of the older children. It is wise to leave the training of her to the nurse in charge, and her off-duty time should never be the same as that of the upper nurse.

The Uniform. The indoor uniform of a children's nurse may be somewhat similar to that of hospital and district nurses, and consists of a washable linen frock, a bibbed apron of white linen, and a small cap to match. In some cases a white overall is worn and the cap is replaced by a square of linen, folded triangle-wise, and fastened round the head. The colour of her outdoor uniform is generally of dark grey or other subdued shade, such as navy blue or dark brown.

There are institutions for the training of nurses, and from these they can be obtained. One such is the Norland Institute at Winton, Chislehurst, Kent. Nurses must be insured under the National Health Insurance scheme.

THE NURSERY AND ITS ESSENTIAL FEATURES

Pleasing and Healthful Arrangements for the Children's Quarters

This article deals with the decoration and furnishing of the ideal nursery. Entries bearing on the same subject are Baby Chair; Cot; Play Pen. See also the articles on Baby; Child; Toys; and those on Central Heating; Electricity; Fire.

The ideal arrangement in a roomy house is to have separate day and night nurseries with bathroom exclusively devoted to their occupants. Unfortunately this is not possible in a big percentage of homes, and the tendency in modern building is rather to decrease than increase the number of rooms, while the rents of town flats and maisonnettes necessarily limit space for many families. The essential thing about nursery quarters, whether combined or in separate parts, is that the children may be able to develop in them to the best advantage both mentally and physically.

Where the one room is available it should be particularly light and airy, and if possible have a S.W. or S.E. aspect. It should be large enough to allow of proper air space at night, and, to accommodate one nurse and child, should not be less than 12 ft. square or, if oblong, about 14 ft. by 10 ft. Windows should be large enough to admit plenty of light and air, and should in all cases be effectually barred across the openings. In town houses where a nurse is in charge nurseries are best situated at the top of the house. The children thus get better light and air and are away from the coming and going of the household on the lower floors. There should be a safety gate at the top of the stairs.

If two rooms are available it is better to keep the larger for the night nursery. The size of the room for play and meals is not so important, but naturally the more space there is here, too, the jollier it is. For a small playroom the lighter and scantier the furniture the better. Many pieces get in the way of free movements and cause unnecessary knocks and falls. Warmth and air without draughts, so essential for children, are more

difficult to regulate in the very small room in cold weather and there should be an upper ventilator to the window.

Perhaps one of the greatest advantages of two rooms is that as children are sensitive to their surroundings the disappearance of all suggestion of daytime activities and exciting toys or games and the appearance of all that gives the idea of quiet restfulness is conducive to sleep. Certainly the two rooms give delightful scope for decoration. The brighter colours and gay cretonnes, pictorially dramatic events painted on screen, frieze or furniture, or worked on rugs and cushions, are usually kept (with discretion) for the day nursery, while the quiet tones predominate in the night nursery and the furniture is simple.

Suitable Decoration. It is pleasant to think that the days are gone when anything was good enough for the nursery, and that architects and furniture designers have concentrated in producing charming quarters for small children; that shops and stores and firms dealing in floorings, wallpapers, fabrics, furniture, china, bed and meal time necessities, stock and manufacture all kinds of pleasing articles especially for the use of nursery folk. On the other hand, in some of the super-decorated nurseries, specialisation is overdone. The colours employed are too glaring, the white furniture is varnished to a dazzling degree, stencilled or painted with strange creatures, while the antics of a medley of grotesques straggle over the walls and screens, appearing on chinaware and table cloths at meal times—to say nothing of bibs and feeders—on the down quilt and foot of the cot at night, all over the linoleum and the cretonne curtains. Mother Goose,



Nursery. Fig. 1. Ideal day nursery, with plenty of window, light, air, and floor space. The walls are hung with gaily patterned paper, and the rest of the equipment is simple but charming.

in some cases, is a painted flying across the ceiling with favourite characters attendant, to add to the restless effect.

All this lavish ornamental stimulation is probably as bad for quick-witted or highly strung children as the neglect of their peculiar requirements was in the past. Modern life tends to make children more active-minded. Mechanical toys and gramophones, the ordinary events of an everyday walk, for those who live in large towns, the general noise and bustle around them, are quite sufficiently exciting without the distracting turmoil of a nursery where things appear seldom to stand still and nearly every spot tells an adventurous story.

Small children certainly like bright colours, but it is not necessary to surround them with these. Instead of highly decorated walls, flat paint in a pale shade is desirable; but the colour chosen should be soft and beautiful. Rushing from the idea of exuberant ornament one does not want to fall into the other extreme of a nursery like a hospital ward, so severely painted in white and so strictly hygienic in its furnishing that no child could regard it as a homely playroom or place for cosy rest. After all the room is for the child not an exhibit for visitors, or a place where cleanliness, however important, is the only consideration. It serves his purpose if he can live his life happily in it, and his life is mainly occupied in eating, sleeping and play. The last is of immense importance to him and means not only amusement, but development and education. He wants to bring furniture and accessories into his own scheme of things, and up to this point specially designed surroundings are helpful, beyond it they probably retard his mental growth as they provide too many cut and dried ideas and do not allow scope for his inventive mind or individuality.

Choice of actual colour for the walls must be governed, as in other rooms, by the aspect. When there are two nurseries, either a pleasant pale green, dove grey or blue are good for the sleeping room, as these shades are conducive to rest. Should the room be dully situated pale pink is more soothing than yellow, which, however, is an admirable choice in a clear shade for the playroom. Dark or violent colours are obviously a mistake for walls, but a lighter colour or deeper tone may be employed for skirting, door and window frames.

When possible enamel should be used. Although the first cost is greater, it lasts far longer than distemper and can be washed clean from grease and finger marks, which distemper cannot be. Where expense has to be considered, the part of the wall above the painted dado can be distempered to match, or in a lighter tone which is carried over the ceiling. A varnished or washable wall paper with an unobtrusive pattern is a better alternative to paint than is distemper. A paper with a deep cream ground looks well with either a coloured paint to tone with the pattern, or with natural oak woodwork. White should not predominate on the walls, either painted or papered, as the glaring effect of this may have a deleterious effect on

children's eyes. The smaller and darker the nursery the more important it is to keep the mural decoration plain and of a pale colour that is also suitable for the ceiling (such as pink, primrose, or deep cream) so that the impression of space may be given and the light increased by reflection.

For a day nursery a plywood dado has been employed with success. Blackboard panels are placed at intervals. These are covered with a specially prepared black paper on which the children can draw with chalks to their heart's content. The drawing can be easily rubbed off and the black renewed occasionally by an application of special waterproof ink. The rest of the dado is painted in a light colour to match the walls above it. The children use the plywood as a picture gallery, and with drawing pins affix any posters, prints or cards which they fancy. Sometimes unbleached calico is used as a surface for the dado, and decorated with cut-outs of gummed coloured paper. The children copy simple designs, directed and helped only when necessary. These panels and blackboards afford endless amusement and awaken the child's creative and artistic powers. Another idea is a notice board covered with serge or baize on which cuttings from a children's paper or cards which he receives are pinned.

Where there is only a single nursery these excellent ideas need not be abandoned if one end of the room is kept as the playroom and the plywood dado or board is limited to that part. When pictorial wall panels are employed these also need not be repeated on those portions of the wall visible from the cots, which can be further separated by the use of draught screens. Nursery pictures, whether applied or detachable in frames, should be hung at a level where they can be easily seen by the children. Where the latter are old enough they should be encouraged to choose such things for themselves. Pictures, if any, should be few and restful in the night nursery.

A nursery bathroom provided with a sink, gas ring, a baby's bath, as well as the usual one, and a lavatory basin, and large enough to contain a gas fire and plenty of



Nursery. Fig. 2. A special feature of this nursery is the large folding wooden play pen set in a thick rush mat. This is a boon to busy mothers, for a toddling child can thus be left in safety.

Courtesy of Heal & Co

airing accommodation solves the problem of where to wash up the meal crockery, etc., and where to do the essential laundry. In the bigger household friction is often avoided by making the nursery quarters self-contained with store cupboards on the landing and built-in cupboards for linen and utensils.

Heating a Nursery. Central heating is a desirable method of warming the nursery. Gas fires combined with rings are very suitable and economical, especially for the night nursery, where a coal fire which requires making up is disturbing. On the gas ring foods are heated and also water as needed.

A closed anthracite stove or fire is suitable and ensures a warm room in winter. The open coal fire, though it means more work, is often liked for the day nursery. If the existing grate is unsatisfactory a slow combustion stove may be chosen and if it has holes on either side, these will heat irons, water or food. The day nursery should be kept at a temperature of 60 to 65° F., while that of the night nursery should be at least 55° F.

In districts where gas and electric light are not available a modern type of oil stove, provided it is of good solid make with a firm base, is suitable for warming the night nursery.

A strong fireguard of wire mesh must be placed round an open fire, electric, coal, oil or gas stove. The top of the fireguard should be securely fixed to the mantelpiece or wall with neat iron hooks. A useful type of nursery fire guard is illustrated in page 453, but a nursery fender should be used as well, with an outside rail for airing clothes.

Electric lights should be shaded. If oil lamps are used these should be placed on brackets or shelves at such a height that there is no possibility of their being knocked over. A hanging green nursing lamp is useful for the night nursery. Dark blinds or practical curtains of light resisting fabric are essential for the windows. These curtains should be of a washable material such as Bolton sheeting. Cretonne should be lined unless blinds are also provided for the night nursery.

Floor Coverings. Cork carpet is much used for floors, but is not so suitable as



Nursery. Fig. 4. A capacious attic is here shown adapted to a sleeping and play room. There is a comfortable window seat with toy cupboards underneath, and a delightful idea is the notice board.

linoleum. The rough surface of the former allows dirt to penetrate, so that it is less easy to clean thoroughly with soap and water. Carpets are not recommended, as they hold both dust and dirt. Linoleum on suitable underlay is the best choice, with one or two washable rugs. Indial rubber floorings are suitable, as they are waterproof, warm, and noiseless. Where there is a good floor of wood blocks, these are left bare with the exception of the rugs. Sometimes the floor is coloured or stained, and finished with waterproof varnish; but these bare floor treatments have the disadvantage of not being so comfortable for the toddler, who spends much of his time on the floor. Also, nursery floors should not be polished, as this leads to many tumbles and accidents. Practical floor

cushions which harmonize with the room and are covered in terry cloth or some such pleasant material should be provided. A cretonne floor mattress is also a very useful accessory.

Furnishing the Room. Furniture for the nursery should have rounded corners, and be light, strong and washable. In the night nursery natural oak is often used. Here the furniture should be that of an ordinary simple bedroom, the cots standing out in the room with air circulating round them, but free from draughts. A cot should be on castors and should not be placed between a window and the fireplace, or between a window or door without the protection of an efficient draught screen. A really comfortable bed should be provided for the nurse. There should be neither cot nor bed valances. Pretty washable bedspread and cot coverlets should tone with the curtains. A trolley service wagon is useful when the nursery is in a flat, or when day and night nurseries are on the same floor.

The day nursery may have oak or painted wood furniture. A firm table is essential for meals, an ironing table, a comfortable arm chair and one or two ordinary-sized chairs, and a baby's chair. Otherwise the furniture for small children should be to scale. It should include low shelves for toys, or a practical cupboard, low tables on which to place toys or games while being used, low chairs, and if possible an indoor play pen and a wide cushioned window seat or a settee.

Painted furniture can be renovated with a coat of fresh enamel at small cost. Elm or oak lasts well, but mahogany is not so suitable for the nursery. The old wheelback Windsor chairs are hardy and ornamental and have no sharp corners. They can frequently be picked up inexpensively at second-hand shops. A plain kitchen table is not to be despised, and an oak chest of drawers and linen chest may be acquired. Some modern nurseries have cupboards built into the external wall, with ventilators, and these make an airy and cool receptacle for milk and food. The nursery crockery and table linen should be chosen to tone with the scheme of decoration, and bright colours with cheery but not ugly designs are desirable.

Planning of Nurseries. Our first illustration is of a nursery in a modern house planned with wide bay windows, of which the children



Nursery. Fig. 3. A nursery to delight any child. It has a large play house fitment, the roof of which is reached by a miniature stairway, giving a playing platform at window level. A swing hung from the ceiling is made safe by the use of strong netting instead of rope.

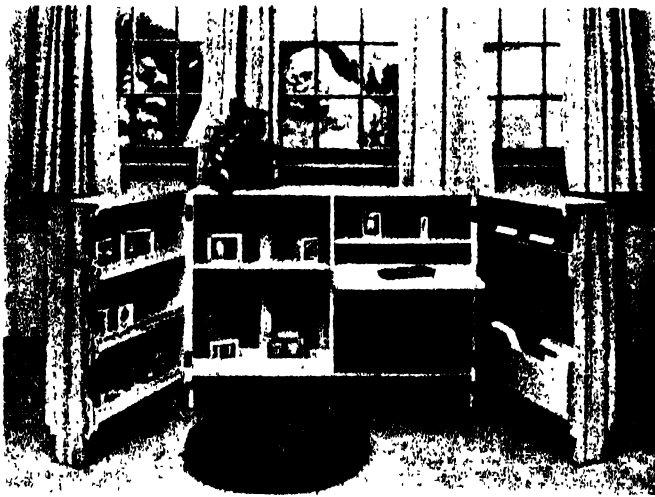
(Continued on page 851)

have the benefit on the first floor. There is a washable wallpaper in a softly multi-coloured pattern, but the curtains are of heavy cotton fabric with an unobtrusive floral sprig and the simple wicker chairs and table are of plain type, so that the patterned effect is not overdone. A sponged linoleum in a soft shade of blue, to tone with the ground of the wall paper and curtains, would provide the flooring. The two pieces of oak furniture enhance the light colours of

the rest of the room, while the toy chest on wheels, the little gate leg table and low chairs could be painted in dove grey, the colour used for the woodwork of the room. There is nothing exciting or ugly in the whole scheme. The night nursery (not shown) is furnished in the same style but with plain walls.

A day and night nursery combined is shown in Fig. 2. This is planned on simple but pleasant lines. No childish decorations appear on walls, floor or furniture. The few pictures are restfully coloured, the linoleum and curtains could be in soft leaf green, and the walls of rose pink with a paler shade of pink for the ceiling. The furniture is of natural, unstained oak, light in colour and unpolished except by hand rubbing. Comfort for the toddler, when busily engaged within the folding play pen, is insured by the thick rush mat.

A large room in a town house has been converted into the day nursery seen in Fig. 3. The windows are high up, so a play house has been constructed by a handyman with a staircase and roof sufficiently strong to bear the weight of the children with perfect safety. The roof is on the window level. It is in turn a roof garden, a fortress, and a place for playing games where toys will not be disturbed. The lower part of the window, hidden by the safety surround of plywood, is well baited. The door into the play house is practical and is well lighted by its window.



Nursery. Fig. 5. Ingenious piece of furniture which folds into a compact cupboard when not in use, and when open provides a desk and shelves.
Courtesy of Gill & Reigate, Ltd.

There are also shelves and an individual locker for each child. In this room there are no decorations beyond the pleasant colour scheme of corn coloured paint for the dado, with deep cream distempered walls and ceiling and paint work in bright blue in order to match the curtains.

NURSING IN THE SICK ROOM

Simple Suggestions for Looking After Invalids

In addition to the articles on the various illnesses, e.g. Chickenpox, Measles, the reader is advised to consult the entries: Bedmaking; Bedroom; Disinfection; Hot Pack; Hot-water Bottle; Infectious Disease. See also Invalid Cookery.

Home nursing comes into the experience of almost everyone, and there are certain general rules which should be observed. The sick room must be cleaned and dusted every day; ashes raked out of the fire and cleared away; no soiled linen or dressings left littered about. All these matters may be attended to when the patient is the least fatigued or distressed, and with as little fuss and bother as possible. Unless the doctor in attendance orders otherwise, the patient must be washed all over once daily.

The process is as follows. Take the patient's temperature. Put the fresh clothes to warm if the weather is cold. Fill the hot bottle. Shut the window. Fill a basin with water as hot as the hand can bear. Have soap and towel handy. Remove sheets and superfluous coverings from the bed, remembering always to keep one of the blankets over the patient. Now roll the patient into an old blanket or thick bath towel, and wash quickly and thoroughly, not forgetting to wipe quite dry. Wash and dry each part separately, and cover immediately with the bath-blanket. Wash the back especially well, and note any pressure marks which might develop into bed sores. All sores should be reported at once to the doctor. Water beds and ring pillows can always be borrowed or bought if required.

Remove the bath-blanket, still keeping the patient covered with the upper blanket, put on warm, fresh clothes, and brush and comb the hair. If the doctor permits, the invalid can be lifted out on to a chair or couch when the bed is re-made, but this is not at all necessary, for the under sheet and blanket can be rolled under the body and renewed. It is important that all under-sheets and blankets be free from creases and crumbs. All this is best done in the morning; but restlessness and sleeplessness in the evening are often relieved by sponging the face and hands.

In all cases of pneumonia, high-fever, or gastritis, the mouth should receive special attention. It should be cleaned out before and

A modern day and night nursery is shown in Fig. 4. This is a country attic room, and the delightful window treatment, with its dainty voile curtains, dark blinds and cushioned seat, is the principal feature. The linoleum is in two shades of brown, and is laid over a sound deadening felt paper. More decoration is allowed on the walls in this room, but the cuts (not seen in the picture) are placed and screened, so that no exciting things are visible to their occupants at night. Favourite nursery rhyme figures have been stencilled on the frieze, and a few on the piece of wall by the novel look house, and on the waste-paper basket. There is a safety ventilator for the lower part of the sash window. The walls and ceiling are painted deep cream, and the woodwork very.

The nursery cupboard, made of oak, illustrated in Fig. 5, is most useful. When not required for play it folds away into a compact cupboard. When open it is a delightful piece of furniture on whose shelves toy-rooms or shops can be built. There is also space for picture books and a lift up flap desk at which painting or scribbling can be done in comfort.

The chair shown in Fig. 6 is a particularly useful and comfortable one designed for mother or nurse. It is well upholstered and possesses two large hinged box drawers for all sorts of requisites and a sliding leg rest. There are also receptacles for books and oddments under either arm.

after food with glycerin and borax, or glycerin and lemon.

The diet of all invalids should be light and easily digested, and the doctor's orders must be obeyed implicitly. The food should be given at regular intervals in appetizing form, and never kept in the sick room. Medicine and treatment must be given at the hours ordered but the patient should not be awakened.

The regular action of the bowels should be encouraged daily, and the urine measured and saved for the doctor if required. The bedpans and urinals must be kept spotlessly clean and well scoured with hot soda water or disinfectant every day; they should be covered with a cloth when carried to or from the room. It is a great comfort to an invalid if such utensils are warmed with hot water before use, and warmth also aids the evacuation of the bowels and the passing of urine. If the patient is in a recumbent position a small pillow or pad placed under the back relieves pressure when the bedpan is in use. Except in chest or kidney cases the windows should be opened wide after the action of the bowels. Any difficulty in the daily functions must be noted and reported.

All matters likely to alarm or agitate must be kept from the invalid, and visitors to the room should avoid any appearance of anxiety or fussiness. Every effort should be made to aid adequate rest and sleep. A gloved hand may be used for putting coals on the fire, or lumps may be wrapped in newspaper. Small coal and damp dust in a strong paper bag, if placed at the back of a fire, will keep it in for hours at night.

Infectious Diseases. Infectious illnesses require special preventive measures in a private house. A sheet soaked in a strong solution of carbolic or lysol should be hung over the bedroom door and kept damp. Carpets and curtains must be removed at once from the bedroom and suitably disinfected, and the floor must be washed over at least once a day with disinfectant. All soiled clothes and bed linen must be removed

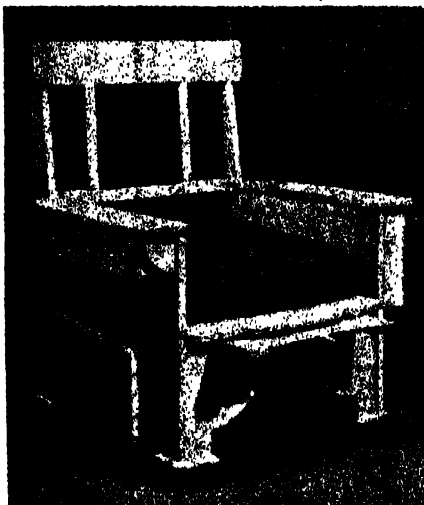


Fig. 6. Comfortable work chair for mother or nurse. Under the seat are two large hinged drawers and a sliding leg rest.

Courtesy of Gill & Reigate, Ltd.

in a covered pail, and immersed in strong disinfectant if they cannot be at once boiled in a copper. With typhoid all the motions and urine should be disinfected for 4 hours before being emptied down the drain.

An enveloping overall and cap should be worn by anyone entering the room, and removed on leaving. Hands and nails must be well scrubbed and disinfected, and if possible different shoes worn outside the sick room. Anyone nursing an infectious case, especially measles, diphtheria, and scarlet fever, should gargle her throat 2 or 3 times a day with a very weak solution of disinfectant. All cups, spoons, and utensils of every description must be kept apart.

Looking after the Nurse. Special care should be given to the health of the friend, relative, or trained nurse upon whom falls the responsibility and care of the patient. Her meals must be regular and sustaining, and always served in a room other than the patient's room. A trained nurse takes her meals with the family, never with the domestic staff. If she is on night duty she must be given a good digestible meal on rising and before she returns to her work. Provision must also be made for a meal or meals during the night.

Most trained nurses are prepared to do 12 hours' continuous duty, but the untrained woman should not undertake more than 8 or 10 hours'. On being relieved from duty, all persons would be well advised to take brisk outdoor exercise. If the case is specially fatiguing, a long bus or motor ride is refreshing, or a seat in a quiet part of the garden with a congenial book. The recreation should extend over a minimum of two hours. Night nurses will find outdoor exercise especially beneficial, as it stimulates the circulation and produces a certain amount of fatigue, so that sleep, even by daylight, comes more easily.

The minimum of sleep allowed is seven hours, and if possible eight hours' consecutively. Those doing night work should be shown especial consideration, and be given the quietest room in the house, at the greatest possible distance from the sick room. All members of the household should be warned of her hours of slumber. Where a trained nurse is employed, her advice must be followed as to her own meals, etc.

A trained nurse can usually be engaged from the private staff of one of the great hospitals, from a co-operative society, or on the personal recommendation of the doctor in charge of the case. In the two former cases the nurse will be under the rules laid down by the hospital or institution from which she comes, and the fees will not be paid to her direct, but to the hospital. Should she be a private individual working single-handed she will have her own regulations and will be paid direct. The weekly fee does not include the nurse's laundry, which is also payable by the employer.

As a general rule a nurse supplied by a society or institution is not allowed to remain more than three months with one case. It is, however, usually possible to have this time extended under certain circumstances, but six months is the extreme limit allowed. Nurses working privately are free to make their own arrangements.

Patients receiving treatment under the National Health Service are generally removed to hospital when prolonged nursing is required.

NURSING HOME. The charges made by a nursing home vary with the locality and with the room; but the charge invariably includes the patient's entire board and lodging, together with expert attendance by trained nurses. As a rule the doctor's fees are extra, though where a patient is in the

doctor's own nursing home the medical fees are occasionally included. In surgical cases the surgeon's fee is paid separately, but his visits to the patient while in the home are included in the charge for the operation.

People who cannot afford nursing home fees but do not wish to be treated under the National Health Service can arrange to be taken into a private ward of a National Health hospital, where a charge is made. There are also institutions endowed by charitable bequests where persons of small means are received at almost nominal prices.

NUT: In Engineering. A nut is a fastening device, generally with a hole in it, the sides of which are screw threaded. It is used in conjunction with a screwed bolt or stud, or fixed on to a cylindrical piece having screw threads corresponding to those in the nut. *See Bolt; Castle Nut; Lock Nut; Stud.*

NUT: The Shrub. The name nut is generally applied to the genus *Corylus*, which includes the cob, hazel, and filbert. All are summer leafing shrubs, and can be grown in any open sunny position, either as a plantation or as hedge plants, for which latter purpose they are splendidly adapted. A stock can be raised from nuts sown in the open garden in autumn. Suckers can be taken from old plants in October, and replanted. *See Chestnut; Cob Nut; Walnut, etc.*

NUT: As Food. A highly nutritious food, nuts are indigestible unless thoroughly masticated. When eaten in quantity it is best to grind them, or to buy one of the preparations sold by vegetarian depots. Nuts contain a large quantity of both protein and fat. Coconuts and Brazil nuts are very indigestible. Chestnuts are the most easily digested, and next in order come walnuts and pea-nuts. Walnuts are said to be laxative when eaten between meals.

The following table shows the average composition of nuts in common use:

Nuts	Water	Carbo-hydrate	Pro-tein	Fat
Almond	6	10	24	54
Brazil	6	7	17	67
Chestnut (fresh) ..	34	45	6	8
Pea-nut	9	19	28	42
Coconut	47	8	5	36
Walnut (dried) ..	4	7	15	63
Filbert	31	13	16	65

The chestnut is especially useful as food; it is rendered far more wholesome by being thoroughly boiled for 10 min., and afterwards roasted. Nuts can be dangerous to people with weak stomachs and to young children.

Nuts are employed in cake-making and confectionery, and form an important ingredient of such foods as nut butter, nut galantine, nut sandwiches, etc. Chestnuts are used in a variety of ways, which include the making of a special forcemeat for foods, while almonds, walnuts, coconut, and pistachio nuts, sometimes shredded and coloured, decorate cakes, trifles, fruit ices, chocolates, and creams.

Nut Bread. Nut bread can be made by mixing together 2 breakfastcupfuls wholemeal flour, half that quantity self-raising flour, $\frac{1}{2}$ breakfastcupful brown sugar, 3 teaspoonfuls

baking-powder, 1 teaspoonful bicarbonate of soda, and 1 cupful chopped walnuts. Add a pinch of salt, and mix the whole to a fairly stiff paste with 1 pint milk, either fresh or sour. Turn the mixture into a greased tin, and bake for about 1 hour in a fairly hot oven, testing with a skewer to see if it is done.

Nut Butter. To make nut butter, shell and skin some nuts of any kind, grind them to a powder, and then pound them in a mortar with the butter. When a smooth paste is formed, the butter may be put into jars and used as required. *See Almond; Brazil Nut; Chestnut; Coconut; Vegetarian Cookery; etc.*

NUTCRACKERS. The implement that is used for cracking a nut consists of two levers, or hand grips, joined at one end by a small link piece on which each of the levers is separately jointed. The nut is placed as near to the joint between the two levers as possible, and when pressure is brought to bear on the ends the shell of the nut is cracked. Nutcrackers are made of steel, brass, and other metals, usually electro or silver plated.

The designs vary, some being grotesque in appearance, others ornately carved, and the rest plain. In some varieties, of which the pair of nutcrackers on the right of the illustration is an example, the levers are so jointed to the link piece that when they are turned over or reversed they come close together, and are used for cracking small nuts, but when turned in the opposite direction the space between the levers is larger, and will take any size nut.

NUTMEG. The fruit of a tropical plant known as *Myristica moschata* is the nutmeg of which there are many varieties with different names, but none are suitable for practical cultivation in Great Britain.

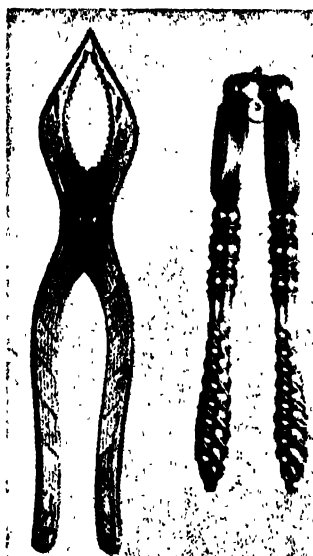
In a grated form nutmeg is used as a flavouring for various kinds of food, and to milk puddings particularly lends a distinctive taste. The essential oil is used as a perfume, and also made into a flavouring essence which is useful in cookery and confectionery. It is made by adding 1 oz. of the essential oil of nutmeg to 1 pt. of rectified spirits.

In medicine nutmeg acts as a carminative and may be given in indigestion accompanied by flatulence. It is sometimes used in mixtures as a flavouring agent; for example, it does well in a mixture containing ferrous sulphate. It has also a somewhat narcotic effect. Its preparations are: the powdered seed, dose, 5 to 15 gr.; the oil, $\frac{1}{2}$ to 3 minims; and the spirit, 5 to 20 minims. Large doses produce poisonous effects.

Nutmeg Grater. This is a small device of pierced tin by means of which nutmegs are grated to powder. *See Grater; Junket.*

NUTRIA. The durable fur obtained from the rodent known as the coypu, a species of beaver, is of a warm golden brown shade. Nutria is specially dressed to resemble the more costly beaver. Sometimes it is given a silvered effect. It is chiefly used for fur coats and for winter trimmings for women's cloth coats. *See Fur.*

NUTS IN MAY. This popular game can be played by any number of children up to 20 or a few more. It is most suitable for indoors, but can also be played outdoors.



Nutcrackers. Strong plated silver nutcrackers, the pair on the left being provided with special teeth for cracking Brazil nuts

The players are divided into two equal parties and, standing in line and holding hands, these face each other, leaving as much space as possible in the centre. One line then advances and retreats, singing this verse as they march to and fro:

Here we come gathering nuts in May
Nuts in May, nuts in May,
Here we come gathering nuts in May
On a cold and frosty morning.

The other side does the same, singing the second verse as they march:

Who will you have for nuts in May,
Nuts in May, nuts in May,
Who will you have for nuts in May
On a cold and frosty morning?

The first side quickly choose one of their opponents, whose name is inserted in the verse which they sing as again they march to and fro.

We will have (Ethel) for nuts in May
Nuts in May, nuts in May,
We will have (Ethel) for nuts in May,
On a cold and frosty morning.

The side to which the chosen player belongs takes up the song, asking:

Who will you send to fetch her away
Fetch her away, fetch her away?
Who will you send to fetch her away
On a cold and frosty morning?

The side which has named the player names one of its own members to fetch her away thus:

We will send (Mabel) to fetch her away,
Fetch her away, fetch her away,
We will send (Mabel) to fetch her away
On a cold and frosty morning.

The two chosen players advance for a tug of war. A mark is made on the ground by laying down a handkerchief or in some other way, and the two, having clasped hands, tug. The one who is pulled over the mark joins the side to which the winner belongs. The verses are then gone through again with the side that sang the second verse last time now taking the first and it can continue until one side is reduced to few or no players. See Children's Party.

NUTTALIA. This is a hardy leaf-losing shrub, *Nuttalia cerasiformis*, which grows 4-5 feet high. It bears white flowers in early spring; the flowers are not particularly attractive. A crop of red fruits will result if bushes bearing male and female flowers are planted. It thrives in ordinary soil, and may be increased by division in autumn.

NUT WEEVIL. There are two weevils destructive to nuts, one attacking the kernels and the other the foliage. Remedies are free dressing of soil round the bushes with a soil fumigant during winter or early spring, and spraying with a good wash in May. Where bushes are badly infested with leaf-weevil the branches should be shaken over sheets of paper smeared with some sticky substance to catch the weevils as they fall. See Insecticide.

NYLON. Form of artificial silk made from coal, water and air. It is extensively used for stockings. See Artificial Silk.

OAK: The Tree. The chief native British tree, *Quercus robur*, or the oak, is useful alike for timber and ornamental purposes. There are evergreen oaks and others, the bark of which yields cork. Ordinary trees for lawn and specimen purposes can be raised from acorns planted in autumn at a depth of about 2 in. When the trees are about 1 ft. in height they should be planted out about 1 ft. apart every way, and again transplanted during the following late autumn or early winter.

The planting of oak trees in gardens is not recommended; it is a task for the forester in the plantation. An occasional tree to celebrate a coming of age or other festive event will be

quite sufficient for the welfare of an ordinary garden. Acorns gathered in autumn will germinate if sown during the following spring.

OAK: The Timber. There is no other wood equal to English oak in durability, hardness, toughness, weight and flexibility. It has great strength in proportion to its weight and is subject to very little warping and shrinking. If only one or two of these qualities are wanted to predominate, other woods can be found that are superior to oak in one or two respects, but are inferior to it in others.

A good proportion of oak is cleft instead of sawn, that is, it must be sawn across the grain but is split lengthwise. The cleavage follows the grain, and for many purposes the wood is stronger than it would be if sawn. The cleft pieces are not so straight as sawn ones, but they may be planed or turned and retain the advantages of cleft wood. Wheel spokes and ladder rounds are made in this way. Pales for fences and hurdles are used roughly cleft, and rails for field gates are often cleft. Sawn wood, however, is cheaper than cleft.

No wood, except perhaps mahogany, has been so much used for English furniture. Oak is also used in building. Rooms are occasionally panelled in oak, while in large houses and public buildings it is sometimes used for doors, staircases, doors and other interior woodwork. Oak contains an acid which corrodes iron and causes a dark stain in the wood around the metal.

Difference in Grain. In reducing logs to boards a large proportion of oak is quartered, that is, all the saw cuts or lines of cleavage are in a radial direction from the centre of the trunk, the same as the medullary rays. A log is treated in the first place as in Fig. 1, which gives eight radial surfaces. A thickness is sawn from each of these and then further radial cuts may be made on the remainder, or it may be cut in any way which happens to be most economical. To cut a log entirely in radial directions wastes material, because a number of comparatively useless wedges are left after pieces of parallel thickness have been cut. Quartered oak, therefore, is more expensive than plain oak, for the amount of waste is a great deal smaller when a log is sawn in parallel slabs, as in Fig. 2.

The difference in appearance is shown in Fig. 3. A in Figs. 2 and 3 there are quartered surfaces, showing what is called the silver

grain. At B and C the appearance changes, being farther away from the radial direction and cutting at a tangent to the annual rings. The surface at A (Fig. 3) is preferred, partly for appearance, but mainly because the piece is supposed to be more flexible and will shrink and warp less than that at C, besides which it is more waterproof. For the latter reason the staves for liquor casks are always cut to

present this face. The silver grain seen in radial cuts is much more marked in oak than in any other wood. Cleaving should always be done in the radial direction.

Wainscot oak means the same as quartered oak. Pollard oak has twisted and knotted grain, due to the tree having had its top and branches lopped.

Bog oak is found in Ireland in a fossilized state underground, still hard and sound but black in colour; it is occasionally used for veneer and for small fancy articles.

How to Polish Old Oak. There are several polishes for old oak. One of the best is made

by dissolving 1 oz. each of shredded beeswax and brown sugar in a pint of warm beer. This should be applied while it is warm and then allowed to dry on the wood, afterwards being polished with a soft cloth.

To restore dirty old oak furniture, it is well to clean it thoroughly first. This can be done by adding 1 lb. of American potash to 3 pints of boiling water and applying it with a swab made by tying a piece of coarse rag round a stout stick or lath. The hands must not be put into the mixture or the skin will be injured. After going over the work a few times it will be soft enough to be scrubbed off. This must be done with a fibre brush, not a hair brush. When all the dirt has been removed the work must be allowed to get dry, when it will be

ready for the necessary repairs. The work must next be oiled with linseed oil and given a coat of yellowish polish. When this is dry it should be rubbed with fine glass-paper, and any new wood shaded by mixing a little vandyke brown with yellow polish or gas black, if necessary. It should be laid on with a camel-hair brush. To remove the linseed oil, the whole of the work should be rubbed over with a little turpentine and should then be wax-polished.

Use of Stains. Oak is brown of various shades, and in finished work its colour is often darkened or otherwise changed. It is easily darkened or improved in a number of ways. Oil may be rubbed into it for this purpose, or a solution of bichromate of potash and water applied, or it can be fumed with ammonia. Stains used are vandyke brown, burnt umber, yellow ochre and others, generally with ammonia. Brunswick black and turpentine make a brown stain. All these can be diluted to make the shade required. Aniline dyes are used also, sometimes for other colours than

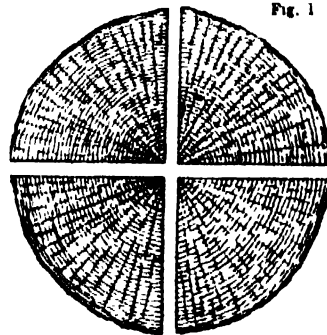


Fig. 1

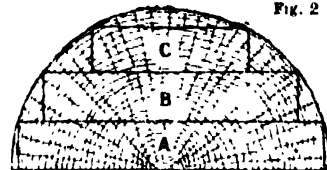
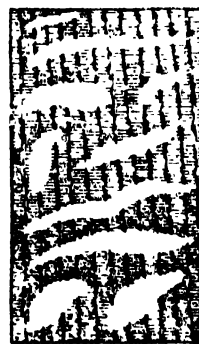


Fig. 2

Oak. Fig. 1. End view of quartered log. Fig. 2. The least wasteful way of cutting logs.



A



B



C

Oak. Fig. 3. Oak cut longitudinally, but at different angles in relation to rings and medullary rays of trunk.

the natural ones of wood. Care should be taken, when reproducing the oak colour for Jacobean style furniture or panelling, not to err on the dark side. The wood should show a rich brown finish.

Finishes for Oak. Antique oak, as it is called, can be made by darkening the wood, which must be straight-grained oak, with burnt umber, or vandyke brown, or a mixture of both, or with burnt umber and drop black. Antique oak stain can be made from 1 lb. of raw umber, 2 lb. of vandyke brown, and $\frac{1}{2}$ lb. of drop black, all ground in oil. Mix them all with a pint of the best brown japan, and thin the liquid for use with turpentine. Several coats of ammonia water will also give the antique appearance, which can be simulated in another way with a stain of iron filings in vinegar or with a concentrated solution of permanganate of potash.

Cathedral oak is another good finish. It shows best on white oak nicely prepared. To make it the surface should first be glass-papered smooth, after which a stain made from 2 oz. of permanganate of potash in two quarts of water should be applied. Let this dry, and then rub it over lightly with fine glasspaper. Give it another coat of the stain, and when this is dry glasspaper it again lightly and apply a coat of black filler. Wipe this off at once and let the work stand for the night; in the morning glasspaper it lightly, and give it a coat of white shellac. When this is dry, glasspaper it lightly again and wax finish the oak. As the finish must be quite flat, the wax should not be rubbed.

Flemish Finish for Quartered Oak

Flemish oak finish can only be used on the best quarter-sawn oak. The wood should be glasspapered and then a coat of Flemish water stain applied. This is made by dissolving $\frac{1}{2}$ lb. of bichromate of potash in a gallon of water. Having been strained, this should be applied with a bristle brush. When it is dry, glasspaper the oak again. Mix up some japan and drop black with turpentine, making it very thin, and give the work a coat of this stain. Wipe it off clean in a few minutes, and then apply a coat of orange shellac. After the work has stood for a few hours it should be smoothed up with glasspaper and another coat of shellac given. When it is hard it may be rubbed with pumice-stone powder. Flemish oak should never be finished with a lustre, nor should the wood pores be filled.

Mission oak can be produced in several ways, the idea being to show a dead black effect in the grain of the wood with a kind of greyish cast to it. The stain should be made from 1 lb. of drop black, in oil, and $\frac{1}{2}$ oz. of rose pink, in oil, thinned with a gill of good japan drier and 1 $\frac{1}{2}$ pints of turpentine, the whole being strained through double cheese cloth. Japan colours can be used in place of oil colours, but in this case the drier must be omitted and a little rubbing varnish added to bind the stain. It should be finished with wax.

For forest green oak mix together 1 lb. of chrome green and $\frac{1}{2}$ lb. of chrome yellow, both of medium shade. Apart from these, mix 3 pints of turpentine, a pint of raw linseed oil and a little good white japan. Thin the colour mixture with the latter, and apply one coat of it to the wood. When it is dry apply to it a coat of white shellac coloured with a little turmeric and a few crystals of green aniline. This, too, should be finished with wax.

For silver-grey oak, make the surface perfectly smooth with sandpaper and then stain it with a preparation of silver nitrate, 1 part in 50 parts of water, both by weight. Apply two coats of this, then a coat of commercial hydrochloric acid, and when it is dry apply a coat of ammonia water of ordinary strength. If the work can be left to dry in the dark the effect will be better. The finish may be in oil

or varnish, but it must not be lustrous, or the effect will be spoiled. See Fumed Oak; Furniture; Graining; Hall; Panelling; Stain.

OATMEAL. For growing children oatmeal is a valuable food, as it is rich in phosphates and promotes the formation of bone and the nerve constituents of the body, but it must always be given with discretion and be discarded for a time if it causes any apparent digestive trouble. For delicate persons or those pursuing sedentary occupations oatmeal is considered rather difficult of digestion, and if served to invalids it should be considerably thinner than for those in health, and on no account should butter be dissolved in it. Some people should never eat oatmeal at all in bulk, and if cakes or scones are made for them, a proportion of ordinary household flour should be mixed in with the meal.

Oatmeal can be cooked in many ways, the most common preparation being porridge, but a variety of other dishes can be made, and it is also employed for biscuits, cakes, scones, and puddings.

Oatmeal requires to be stored with care, and should never be used if it is stale or is impregnated with a strong taste of some article of food with which it may have come in contact. It should always be placed at once in a well-covered store-jar or a wooden receptacle, and it should be examined frequently to see that it is in good condition.

Oat Cake. To each lb. oatmeal allow 1 pint boiling water, with $\frac{1}{2}$ oz. salt butter or lard melted in it to make the cakes crisp. The water should be poured over the meal, and the whole made up very quickly into a fairly stiff dough.

Roll it out about as thin as a half-crown piece, form it into a round, and cut it across and across again. Bake the cakes on a griddle and, when they are a light brown underneath set them before the fire to dry and colour slightly on the top; also to induce the edge to curl over a little. When quite dry and crisp the cakes may be stored ready for use.

A recipe containing a proportion of flour, more suitable for people who cannot take oatmeal in bulk, is as follows: $\frac{1}{2}$ lb. medium oatmeal, $\frac{1}{2}$ teaspoonful salt, $\frac{1}{2}$ teaspoonful cream of tartar, 4 oz. flour, 3 oz. butter or lard, $\frac{1}{2}$ teaspoonful bicarbonate soda, 3-4 tablespoonfuls milk. Mix all dry ingredients thoroughly, rub in the fat, and form into a stiff paste with milk. Bake as in previous recipe.

Oatmeal Biscuit. A good biscuit is made by mixing together $\frac{1}{2}$ lb. medium oatmeal, 4 oz. flour, $\frac{1}{2}$ teaspoonful salt, and $\frac{1}{2}$ teaspoonful bicarbonate soda. Dissolve 2 oz. butter in 3 tablespoonfuls of warm milk, pour this into the dry ingredients, and make the whole up into a dough. Set it aside to become firm, and then roll it out and cut it into biscuit shapes; then prick each and bake them in a good oven about 6 min. To make these biscuits sweet add 1 to 1 $\frac{1}{2}$ oz. caster sugar to the flour.

Oatmeal Cake. Small cakes are made with oatmeal flour and golden syrup, from the following recipe. Sieve together $\frac{1}{2}$ lb. fine oatmeal, $\frac{1}{2}$ lb. flour, and $\frac{1}{2}$ level teaspoonful bicarbonate soda, adding to them 2 oz. candied peel cut into small pieces. Into a saucepan put 4 oz. margarine, the same quantity of granulated sugar, and $\frac{1}{2}$ lb. golden syrup, heating them until the sugar has dissolved, but taking care that they do not boil. When they have cooled, pour them into a well made in the centre of the oatmeal, etc., and mix the whole to a rather stiff consistency. Turn the mixture into some small greased cake-tins, and bake the cakes in a moderately hot oven for about 20 minutes.

Oatmeal Scone. Mix together 3 oz. medium oatmeal, 2 oz. flour, a pinch of salt, 1 teaspoonful cream of tartar, and $\frac{1}{2}$ teaspoonful bicarbonate of soda; rub in 1 oz. fat, and then add 3 oz. washed potatoes. Mix these ingredients

well, adding enough milk to form a dough; then turn the mixture on to a floured board, roll it out about $\frac{1}{2}$ in. thick, and cut it into rounds. Bake the scones on a greased tin in a hot oven or on a griddle. They can then be buttered, and eaten hot or cold. See Gruel; Porridge; Scone.

OBESITY: Its Treatment. The abnormal development of fat throughout the body produces obesity, and an excess of fat is a menace to health. Normally fat is chiefly found under the skin, under the membrane lining the abdomen and covering the bowels, and between the muscle fibres. Any large increase of this fat is associated with weakness of the muscular tissue. Hence arises sluggish action of the bowels and inability to take much exercise on account of the state of the muscles generally, and because shortness of breath and palpitation are easily induced through enfeeblement of the heart muscle. Stout people stand acute diseases badly. There is a tendency for any individual to put on fat after the age of 40, more especially women. But the condition is largely due to over-eating and over-drinking, combined with too little exercise.

A person who is in danger of becoming stout should increase his outdoor exercise, and restrict his intake of fat-forming foods, i.e. fats and carbohydrates, especially the latter, e.g. sugar, bread, milk, milk puddings, malt liquors, and sweet wines. He should be sparing in liquids at meals. Green vegetables may be taken freely.

When an unwholesome degree of corpulence already exists, vigorous exercise may be impossible, and to begin with gentle walking on the level may be all that can be attempted. As the powers increase, the rate should be faster and the hills should be taken. In some cases it may be desirable that a course of massage should precede or supplement exercise out of doors. In these cases, a strict diet must be prescribed and systematically followed.

After the patient's weight has been reduced one or two stones or so, a special diet which he can keep to indefinitely should be devised. This should be moderate in amount, with no potatoes or sweet foods, no sugar in the tea or coffee, and a minimum of bread—about 4 oz. In place of sugar in the tea or coffee saccharin tablets, which can be obtained from any chemist, may be employed. Fatty meats, such as goose and pork, also salmon, eels, and herrings should be strictly forbidden.

The diet, however, should include plenty of such vegetables as cabbage, spinach, etc., as on account of their bulk they give a sense of satisfied appetite. Peas, broad beans, lentils, carrots, parsnips, and broccolo should be avoided. Ale, beer, stout, sweet wines and spirits should be given up entirely.

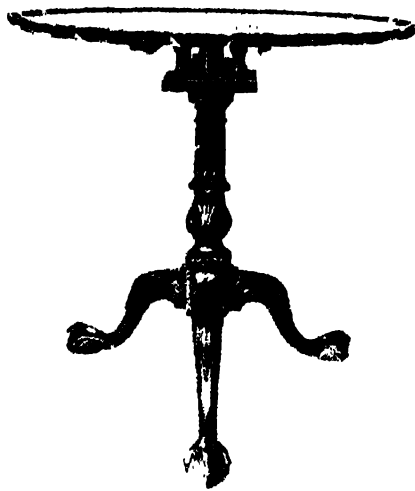
Artificial nostrums should be avoided and drugs are only to be taken on medical advice. Some of those popularly recommended are useless, others are harmful. A Turkish bath may be useful, but must only be taken after the patient has been examined by a doctor as to his fitness for it. See Diet; Exercise.

OCCASIONAL TABLE. By this name is understood tables that are only used occasionally and for casual purposes, being thus the opposite of dining tables, kitchen tables, and others that have a definite use. They are generally small and light, so that they can easily be moved about, and are chosen to suit the other furniture of the room. Nests of three or four tables are useful and obtainable in lacquered, painted and polished woods. When not all required the largest of these tables gives accommodation for books and flowers, etc., the smaller sizes being neatly stowed away underneath it. Low tables are convenient for use beside a settee or divan; Moorish designs look well with oriental surroundings and small gate-leg tables are popular for oak furnished

rooms. Reproductions of the table illustrated are suitable with mahogany furniture and are particularly graceful in shape. See Gate-
leg Table, Table.

ODONTOGLOSSUM. One of the most beautiful orchids, this is suitable for cultivation in a glasshouse having a minimum winter temperature of 45-50 degrees. During summer cool moist conditions, ensured by free ventilation, shade from sunshine and syringing between the plants, are necessary. The pot should be filled to the extent of one-third their depth with drainage: a suitable compost consists of orchid fibre, peat and sphagnum moss in equal parts. Repotting is done in February or towards the end of summer; the pseudo bulbs must be set on the surface of the compost.

Odontoglossum crispum and its varieties, which are heavily blotched with various colours on a white ground, are particularly beautiful, the long arching sprays of bloom being most decorative. Other easily grown kinds are *harryanum*, *Rosin*, *luteo purpureum grande* and *citrosimum*. Innumerable cross-bred or hybrid *odontoglossums* are raised an-



Occasional Table. Example in mahogany with circular top; 18th century
Victoria & Albert Museum, Kensington

OCTOBER

What to do in the Garden

Flowers

Plant hyacinth, tulip, daffodil and other spring-flowering bulbs in beds and borders.
Plant wallflower, forget-me-not, polyanthus and other spring-flowering plants.
Lay down turf to make a new lawn.
Prepare the ground for rose trees by digging deeply and manuring.
Lift and store tuberos, begonia and dahlia as soon as the plants are spoilt by frost.
Plant border carnation, sweet william, Canterbury bell and bulbs of Spanish and English lilies.
Sow sweet peas in pots or boxes of soil in a garden frame.
Take cuttings of leafy shrubs and insert them in sandy soil out of doors.
Insert cuttings of evergreens in sandy soil in a frame or on a sheltered border.
Lift summer bedding plants and place in pots or boxes of soil under glass to supply cuttings in spring.

Move Chinese primula, geranium and herbaceous calceolarias from the frame to a greenhouse.

Lift and repot autumn lilies and place under glass.

Put spring-flowering bulbs set them out of doors and cover with old ashes for 6 weeks.

Re-arrange and replant the hardy flower border.

Fruit

Gather apples and pears on dry days only.

Lift, root-prune and replant fruit trees where necessary.

Take off runner from strawberries and manure between the rows.

Cut out old fruiting canes from raspberries.

Take cuttings of gooseberries and currants and set in sandy soil out of doors.

Prune black-currant bushes by cutting out old branches or parts of them.

Prune loganberries and blackberries by cutting out the canes which have borne fruit.

To ripen late grapes ventilate the glasshouse; keep the hot water pipes warm and the atmosphere dry.

Vegetables

Lift and store beet root, carrot and late potatoes.

Dig and manure and vacant land, leaving the surface rough.

Lift and force rhubarb roots for an early supply of produce.

Plant lettuce and endive in a cold frame.

Plant spring cabbages and all green tomatoes and place in a box in a warm room to ripen.

Line land which is infected with the club root disease.

Look over potatoes in store and remove decaying tubers.

Burn the haulm of potatoes to destroy disease spores.

Complete the earthing up of celery.

Sow seeds of Brussels-sprouts in a frame.

Put cauliflowers and keep them in a frame to the winter.

Food in Season

Fish

Barbel, bream, brill, carp, cod, dory, eel, flounder, gurnet, haddock, hake, halibut, herring, mackerel, mullet (red and grey), perch, pike, plaice, salmon (Canadian), skate, smelt, sprats, soles, tench, turbot, whiting.

Shellfish

Crabs, crayfish, lobster, mussels, oysters, prawns, scallops, shrimps.

Meat

Beef, lamb, mutton, pork, veal, venison.

Poultry and Game

Black game, capercaillie, partridge, pheasant, quail, snipe, woodcock, ducks, fowls, geese, guinea fowls, hares, rabbits, turkeys, wild geese, partridges, pheasants, pigeons, pintails, plovers, ptarmigan, quails, snipe, turkeys, wild geese, partridges, pheasants, pigeons, pintails, plovers, ptarmigan, quails, snipe, turkeys, wild geese.

Vegetables

Artichokes (globe and Jerusalem), aubergines, beans (French), beetroot, broccoli, Brussels sprouts, cabbage, cardoon, carrots, cauliflower, celery, celeriac, celery, chervil.

cross, cucumber, endive, greens, home-made, lettuce, mushrooms, onions, parsnips, potatoes, red cabbage, savoy, scarlet runners, sorrel, spinach, tomatoes, turnips, vegetable marrow, watercress.

Fruit

Apples, bananas, blackberries, cranberries, damsons, figs, grapes, lemons, limes, melons, nectarines, nuts (various), oranges, peaches, pears, pineapple, plum (Californian), pomegranate, quinces, sloes.

Notes for the Month

OCTOBER 1.—Pheasant shooting begins.
OCTOBER 21.—Trick-or-treat Day.
OCTOBER 31.—Hallow-e'en.

cool gas is put, and it has the advantage that the appliances employed in burning it are self-contained and do not involve the installation of permanent piping. For heating, various forms of oil stove can be purchased. Needing no flue they can be moved about from place to place as required, and as all the heat they produce passes into the room, they are very efficient and can warm the air of an apartment to a comfortable temperature in a very short time. On the other hand, they do not ventilate the room, and the products of combustion are not carried away. Further, the effect of such stoves soon dies away after they have been extinguished.

For cooking, oil-burning appliances are made in many sizes, from single burner stoves that serve to boil a kettle up to those with an oven and several burners which will boil, steam, fry, and bake and perform every cooking operation required. Representative types are illustrated in the article Cooking.

The burners fitted in oil heating and cooking appliances are of two kinds. In one the oil is sucked up from the reservoir to the flame by means of wicks, either straight or circular, which resemble those employed in lamps except that they are larger. In the other form the oil, by a slight pressure produced in the reservoir by a hand pump, is forced up to a point above the flame, and after being vaporized by the heat passes to the burner, where it is mixed with air and burnt as a gas. In this form there are no wicks, and consequently the trouble of trimming is avoided. Oil stoves of any kind must be kept scrupulously clean.

With the pressure type of burner, the nozzle through which the vaporized oil issues before being burnt has first of all to be heated up usually by burning a small quantity of methylated spirit in a small trough surrounding the burner, before the issuing oil will ignite. Also the pressure inside the oil container has to be pumped up before lighting up, and from time to time during use, in order to force the oil out through the nozzle in a fine spray.

Fig. 1 shows a pressure type heater in which an asbestos mantle is raised to a high degree of incandescence, a copper reflector projecting the heat out into the room. It holds 1½ pints of oil, which is enough for ten burning hours.

Of the wick burner pattern the heater illustrated in Fig. 2 is typical. It consumes about half a pint of paraffin per hour. If the wick of this stove is kept free from carbon deposit (which can be rubbed off with a piece of newspaper every time before the stove is lit), and the burner kept clean, there is very little danger of smell, and the stove needs no special attention when starting up or burning.

OIL: For Domestic Use.

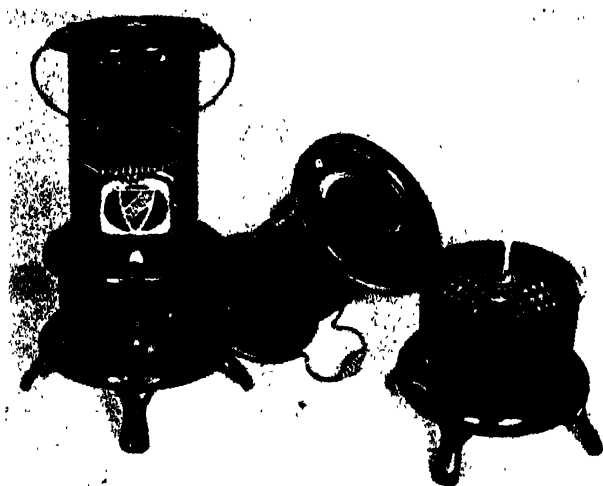
The grade of mineral oil mainly used as fuel in the house is that known as kerosene or paraffin oil. The heavier grades of petroleum known as fuel oil are used to fire domestic boilers and to a limited extent for cooking purposes. A steam or air jet is required to atomize them before burning and a gravity or pressure feed is necessary.

Kerosene can be applied practically to all the domestic heating and cooking purposes to which

Small oil engines are useful as a means of providing power for such purposes as driving electric generators or pumping water from wells. In the article on Internal Combustion Engine is illustrated a type which is started up on petrol and then runs on paraffin oil.



Oil. Fig. 1. Pressure type of oil heating lamp
Courtesy of Lilley Lamp Co.



Oil. Fig. 2. Portable oil stove. It burns paraffin drawn from a reservoir through a sleeve wick

English-American Oil Co. Ltd.

Oil Fuel for Boilers. The use of fuel oil for central heating and hot-water supply presents a number of advantages, apart from the question of cost, in which latter respect fuel oil is more expensive in first cost than are solid fuels such as coke. A fully automatic system can be arranged, controlled by thermostats. There is a saving in labour, of course, since no stoking is needed and there are no clunkers or

with an supplied by a blower. A small electric motor drives the oil pump and blower, and a transformer furnishes the high voltage ignition current. The apparatus, once started, is automatic in action, and needs no attendance. A thermostat in the flue shuts off the ignition current as soon as the burner is alight and functioning regularly. Another thermostat, connected with the boiler, shuts off the apparatus when a pre-arranged water temperature is reached, and a room thermostat in one of the apartments switches off the burner when the desired room temperature is attained. A temperature drop of from two to ten degrees (as pre-arranged) causes the switches to be operated in the reverse manner, so that the burner is started up again and the atomised oil spray simultaneously ignited.

Householders who desire fuller information about oil fired boiler plants should write to the fuel oil department of Shell-Mex & B.P. Ltd., Fuel Oil Department, Shell Mex House, Victoria Embankment, London, W.C.2. This firm maintains a staff to advise interested persons on the selection of appropriate equipment. See *Cooker*, *Fuel*; *Heating*; *Lamp*; *Lighting*

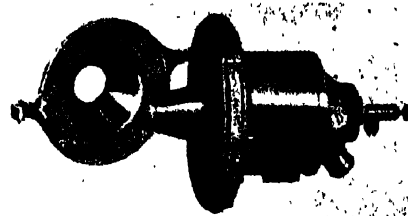


Fig. 5. Ray Midget fuel oil burner with hinge plate mounting, permitting easy access
Courtesy of Ray Oil Burner Products

OIL : In Cookery. Olive oil is the best of all oils for the purposes of cookery. When pure it is practically tasteless and of a pale yellow colour with a slight tinge of green. Only the best quality should be employed. Olive oil is the foundation of mayonnaise sauce and most salad creams. It also enters into the composition of dressings for plain salads. It renders fritter batters exceedingly light, and is often used for the purpose of frying. In Jewish cookery oil is always used.

When moulds or slabs have to be greased in sweet-making oil is employed. Creams

and delicate dinner sweets are set in oiled moulds. Almond oil may be used in place of olive oil for this purpose. Oil of any quality or description is not adapted for making pastry or good cakes, but fish may be preserved in oil. If oil has been kept in store some time and has deteriorated, it can be improved by turning it into a larger

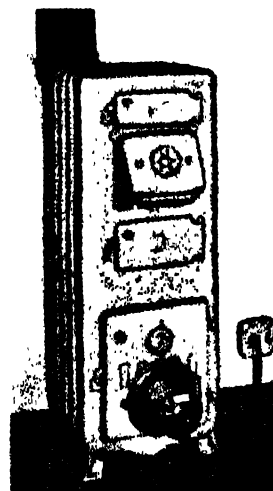


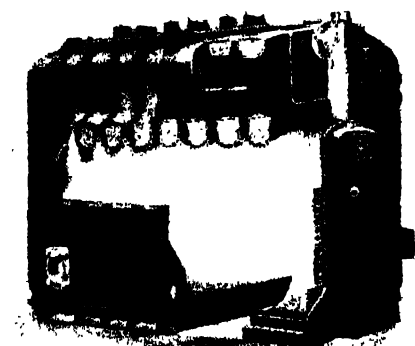
Fig. 6. Ray Midget burner fitted to central heating boiler

bottle and pouring upon it cold water, then shaking it vigorously and letting it stand two hours. When decanting the oil the rancid matter is detained by the water.

OIL : In Medicine. There are two distinct classes of oils. The first consists of the fixed oils, such as linseed, flaxseed, olive, almond, coconut, castor, cod liver, and other oils. Except for cod liver oil all these are of vegetable origin. The second class consists of the essential or volatile oils, including the oils of peppermint, cloves, caraway, cinnamon, dill, lemon, juniper, rosemary, etc.

Some of the fixed oils are nourishing foods, and most of them form soothing applications to inflamed surfaces. Others are valuable medicines, e.g. cod liver oil in tuberculosis and other diseases. The essential oils, which are distilled from plants, stimulate the appetite and promote digestion, or act as an antiseptic. See *Castor Oil*; *Cod Liver Oil*; *Linseed Oil*, etc.

OIL CLOTH. Waterproof covering for tables, shelves, walls, etc. It is made from cotton cloth treated on one side with a flexible film of several coats of oil paint. The surface is usually printed with a pattern, and given a protective coating of varnish. It can be cleaned by washing with soap and water. Sometimes called American cloth (it was first made in U.S.A.), or Lancaster-cloth (where it was first made in England). Oil cloth is often confused with linoleum (q.v.).



ashes to remove. Fuel oil can be bought in lots of two tons (approximately 500 gallons), which is more economical than small quantities. A storage tank holding 3 tons is desirable, and this if rectangular in shape would be about 6 ft. by 5 ft. by 4 ft. The tank need not be indoors, but can be located in some corner of the garden and screened by a hedge, etc. Delivery from the oil wagon is carried out in a few minutes, the oil being pumped direct into the consumer's tank.

Two representative systems are here illustrated. Fig. 3 shows a hand-operated oil burner working on the rotary principle, a system which is applicable to quite small installations. In this type of burner the oil is delivered into a cone shaped cup re-

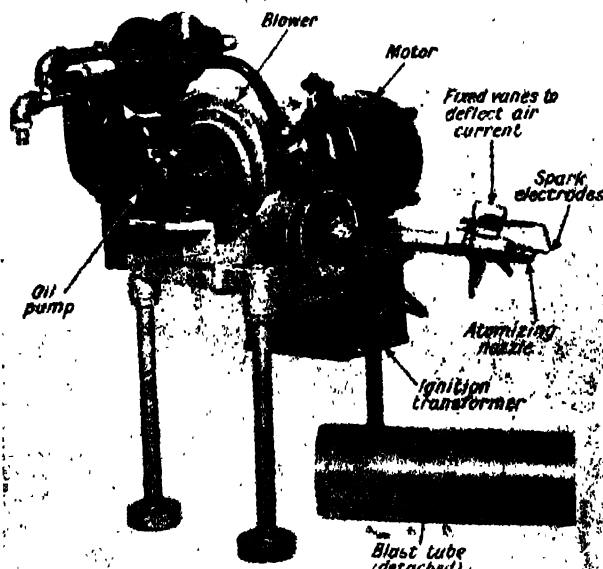


Fig. 3. Section of Ideal Britannia boiler showing oil firing. Fig. 4. Automatic oil burner for central heating boiler

Courtesy of National Radiator Co. Ltd. and of York Automatic Oil Burners

OILSKIN. Cotton cloth coated with boiled linseed oil and dried takes the yellow appearance of a cured animal skin and becomes waterproof and airtight. Seamen's overalls made from this material are called oilskins. They are stiff and heavy, and cold to the touch.

Lighter oilskins made in oiled silk are translucent and made into women's wet-weather coats. The fabric is lighter in weight and dyed in pretty colours, but it tends to tear easily. Efficient ventilation is a difficulty, as body moisture condenses upon the underside of the cold wet garment. Oiled silk is used for bathroom curtains.

OILSTONE. Various kinds of hard stone, composed mainly of silica and quartz, when smoothed and polished and suitably mounted are invaluable for sharpening knives and tools of all kinds. Oilstones are usually lubricated with machine oil, in a few cases water is used for the purpose.

For the amateur, who will mostly use the oilstone for sharpening chisels, plane irons, gouges, and the like, the Washita stone is as good as any. A convenient size is about 9 in. long, 2 in. wide, and 1 in. thick. The stone should be fine in grain, free from cracks or hard places, and should cut freely and not exhibit any tendency to choke readily. These features are only detected when the stone has been in use for a time, and when a good stone has been found it should be retained and used until it is entirely worn out. A finer grain stone, known as the Arkansas, is also a natural stone. It is more expensive than the Washita, but more useful for sharpening delicate tools requiring a very keen edge.

Rougher oilstones, such as the India, are made of various compositions, employing emery and carborundum; they are very quick cutting. A carborundum stone will cut almost as quickly as a fine file, and if much work is to be done, it will pay to have one of this class of stone for rough sharpening, and a finer-grained stone for the setting and finishing-off touches. For sharpening gouges, a

and pushing the chisel backward and forward with a regular, steady motion.

Press upon the chisel with the fingers of the left hand, while the right hand guides the direction of the tool. If the chisel is allowed to rock about the cutting edge will be rounded instead of flat, with the result that the tool will not hold its edge for any length of time. The great object should be so to sharpen the edge that the end of the chisel is straight and square with the sides, but the face inclined at a slightly steeper angle than the other bevelled portion produced by the grinding process.

The plane iron is sharpened in a similar manner, except that, as it is much broader, it may be necessary to sweep the iron diagonally across the stone, so that all the parts receive their full share of it. The gouge is sharpened by rolling it to and fro, and at the same time traversing it up and down on the face of the stone, thus sharpening the whole of the cutting edge. In general, when sharpening cutting tools, keep the handle as low down as is con-



Fig. 4. Showing use of oilstone slip for sharpening edge of hollow-ground gouge

sistent with easy sharpening, as the longer the cutting edge, the keener will be the tool.

After the stone has been in use for a time it becomes hollow in the centre and generally rough towards the ends, and will then require rubbing down. This can be done by grinding, holding the oilstone against the side of the revolving grindstone and lubricating it with water and a little sharp sand.

What are known as ragstones are a rough sort of whetstone, and the coarsest kind is the sandstone, with which gardeners sharpen axes. This is an example of dry sharpening. See Grindstone, Hone, Knife.

ONIMENT. A preparation that has the consistency of butter and is intended to keep some medicinal agent in close contact with a skin or other surface is called an ointment. The basis may be lard, lanoline, vaseline, cocoa-butter, goose fat, or a mixture of one or more of these with sweet almond oil, olive oil, glycerin, spermaceti, wax, suet, etc. Water is added for the

cooling effect of its evaporation. Thus the soothing cold cream is made of wax, spermaceti, sweet almond oil, and rose water.

When rubbed into the skin fatty substances are absorbed to some extent, and carry with them any contained medicament. They soften and clear the skin, and protect it. If the skin is dry and chapped, an ointment containing a little glycerin is a good remedy for keeping it soft and pliable.

Among the most commonly used ointments are:

Boric acid ointment: a mild antiseptic for wounds and abrasions.

Zinc ointment: mildly astringent and soothing, good for ulcers and burns.

Lead carbonate ointment: for sore and inflamed surfaces.

Calamine ointment: soothing and astringent.

Yellow oxide of mercury ointment: full strength or with an equal quantity of vaseline makes a golden ointment for eye complaints.

Mercurial ointment, or blue butter: applied to rheumatic joints and enlarged glands.

Tar ointment: for scalp skin eruptions, eczema.

Sulphur ointment: for scabies or itch.

Stavesacre ointment: for head lice and other parasites.

Capstan ointment or Chilli paste: a counter-irritant which may be used instead of a mustard plaster.

OLD AGE. A people advance in age various changes in the body cause them to feel the cold more acutely than formerly. They should be dressed warmly, wear woollen garments next the skin and have a fire when ever at all chilly.

Daily exercise in the open air is good as long as it is possible to take it, but avoid over fatigue and exposure to wet weather and cold winds. Great care must be taken to keep the skin in a healthy condition by taking a warm bath at least once a week, and sponging the skin daily and rubbing with a moderately rough towel. Constipation is often a trouble, and should on no account be neglected. Regulate the bowels by giving moderate doses of simple aperients, such as a teaspoonful of confection of senna or liquorice powder at night when necessary. Sleeplessness is sometimes also very troublesome, but hypnotic drugs must be used with great caution.

An old man or woman requires only a small quantity of food compared with a young and active adult. As age advances the quantity of food taken must be diminished, or otherwise indigestion, rheumatism, skin troubles, and other penalties will have to be paid. In middle-aged and elderly people all the organs work less actively than in the vigorous period of life.

The food should be light and given in small quantities. As a rule four light meals a day should be given. The principal meal should be taken in the middle of the day. Although the diet should be varied, not more than two, or at the utmost three, dishes should be partaken of at any one meal. Most old people should eat vegetables sparingly, as they are apt to cause flatulent indigestion. Fruit is most suitable in a cooked state. If eaten raw, it should be perfectly ripe. If inclined to put on fat, an elderly person should be sparing in the use of sugar, starchy foods, and fats. Oatmeal is too difficult of digestion, but on the other hand the prepared or patent wheaten foods are especially suitable.

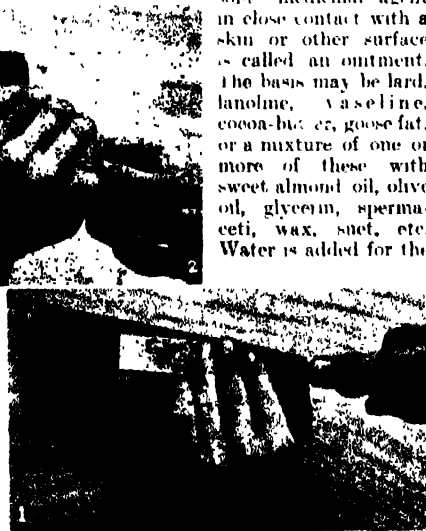
An old person should depend largely on milk for his nourishment. This he should take in sips, spending about 20 min. in drinking a half pint. If stimulants are taken at all, the quantity should be small—not more than a single glass of the stronger wines, or two glasses of a light dinner wine, or a little whisky or brandy well diluted. The best time to take any of these is at dinner. Sometimes, a tablespoonful of whisky in hot milk at bedtime will prevent sleeplessness. See Diet; Sleep.

OLD AGE PENSIONS. By the terms of the National Insurance Act, which came into operation on July 5, 1948, provision is made



number of bevelled slips are obtainable, shaped to suit the curvature of the gouge. Diagonal shaped stones, square, and tapered slips, as they are called, are also available for appropriately shaped tools.

Using the Stone. The whole secret of tool sharpening consists in rubbing the tool on the stone so that the cutting edge is formed at the right angle. Figs. 1-3 illustrate the correct methods of holding a chisel, plane iron, and gouge on an oilstone. In the case of the chisel, this is first ground on a grindstone to the proper angle, and then the extreme end, or cutting edge of the tool, is sharpened on the oilstone by rubbing the chisel on the stone, using the greatest length of the stone



Oilstone. Figs. 1 and 2. How a chisel and a wide plane iron are held while being sharpened on an oilstone. Fig. 3. Finish of stroke when sharpening a gouge; see also Fig. 4

for the payment in Great Britain of old age retirement pensions, irrespective of means, to an insured man at 65 years of age, to his wife at 60 and to any insured woman at 60. To qualify, the insured person must have paid 156 weekly contributions and have had a yearly average of 50 contributions.

Standard retirement pension (1952) is 26s. a week for an insured person, 16s. for an insured woman, or an insured man's wife, payable to men 65-70 years of age on retirement from regular employment, women between 60 and 65. If retirement is postponed beyond the age of 70 by men, 65 by women, the pension is 30s. and 20s. respectively. Persons qualified for pensions become entitled to an increase of 3s. a week for each year in which they remain in employment beyond the retirement ages of 70 and 65. Occasional earnings, by pensioners, of up to £2 weekly entail no reduction of pension.

Certified blind persons over 40 years of age can obtain a weekly pension of 26s. Blindness must be such that work for which sight is essential cannot be performed.

Any person who fails to qualify for a contributory retirement pension under the National Insurance Act may be granted a non-contributory old-age pension provided that: (a) he or she has been a British subject or a naturalised British subject for 10 years; (b) is 70 years of age or more; (c) has resided in Great Britain for at least 12 years previous to application; (d) has a total yearly income of not more than £89 5s. The amount of pension varies according to this total income from a minimum of 2s. to a maximum of 26s. for one person and 42s. for a man and wife. Non-contributory pensions will not be granted to persons becoming 70 years of age after October, 1961.

Contributory pensioners receiving outdoor relief may reserve retirement pensions, but inmates of institutions are not eligible, nor are persons who are in prison or a mental hospital, during the time they are actually detained.

Estimation of Income. In estimating the income account is taken of the income the person is likely to receive during the succeeding year and of the yearly value of any advantage or benefit enjoyed by him, such as the right of living rent free. No account, however, need be taken of the yearly value of any advantage accruing from the use or enjoyment of furniture or personal effects or of the first £25 of capital in possession of the claimant. The next £375 of capital is regarded as earning interest at the rate of 5 per cent., and all capital in excess of this at 10 per cent. In the case of a married couple living together these figures are doubled.

When a husband and wife are living together in the same house the means of either is taken as one half of the total means of the couple. Thus, a man who has an income of £50 a year is entitled to the full pension if he has a wife living with him who is without separate income, or if the incomes of the two do not exceed £52 10s. a year. Old age pensions cannot be alienated.

Method of Application. The conditions outlined above permitting, the first step is to apply for the necessary forms at any post office. These must be filled up by the claimant and the statements made attested by reliable witnesses. They should then be returned to the postmaster of the post office where the pensioner wishes to receive his pension, or to the local pension officer.

The pensions are paid every Friday at the various post offices, generally to the pensioner in person, although a relative or friend can receive them in case the pensioner is unable to get about. The pension book must be presented and stamped each time. In each locality a pensions officer controls the dis-

tribution of pensions, and to him all complaints in connexion therewith should be made. He is also responsible for investigating cases.

Ireland was included in the scheme of old age pensions, but this liability was transferred in 1922 to the Parliaments of the Irish Free State and Northern Ireland, who now pay them. Australia and New Zealand have also old age pension schemes. See Insurance Pension.

OLD MAID. This card game is suitable for two or more players. One card is taken from the full pack, usually a queen; a variation is to take out one card haphazard, the



Oleander. A favourite greenhouse and conservatory shrub which bears rose-coloured blooms in summer

card not being shown. Supposing, however, that a queen is removed, the cards are shuffled and dealt round one at a time to all the players until the pack is exhausted. Each player then looks at his cards and throws out of his hand into the centre of the table all pairs, e.g. two kings, two sevens, etc.

When all pairs have been thrown out by each player, the one on the left of the dealer offers his cards, face downward, to his left-hand neighbour, who can draw any card he chooses. If the player draws a card which pairs with one in his hand he throws the pair so made into the centre of the table; if not, he places it amongst the cards he already holds, and offers his cards in turn to the next player to draw from, and so on.

In the course of time all the cards, except one queen, are paired. It is the object of each player to try to pass this queen on to the next player. The holder of the unpaired queen is old maid. With the variation of discarding any unknown card no one has any idea of which card in the pack will make him or her old maid, and this form of the game is often preferred.

OLD MAN. This is one of the many names of the shrubby *Artemisia abrotanum*. It has fragrant foliage, and is known also as lad's love, wormwood, southernwood, and by many other names. It is an old-fashioned country cottage garden plant. See Southernwood.

OLD MAN CACTUS. A member of the *Pilocereus* group of cactaceous plants, and one of the most popular in small collections is *P. sentile*. This name, in conjunction with its remarkable covering of long white hairs, has made it familiar as the old man cactus. See Cactus.

OLD MAN'S BEARD. This is one of the popular names for *Clematis vitalba*, which is

familiar in British hedgerows and also known as traveller's joy. Its roots are in demand as a stock upon which to graft the choicer kinds of clematis. It blooms in July and bears large clusters of greenish-white flowers. The seeds are provided with long hairs which become covered with a soft pale grey fluff, from which the plant takes this name. Old man's beard is useful for covering bare banks or for training over trellises and tree stumps. See Clematis.

OLEANDER (*Nerium oleander*). This is a beautiful flowering shrub suitable for cultivation in pots under glass. A temperature of 45-50 degrees is high enough in winter; its rose coloured blooms are borne during the summer months. It should be potted in pots or tubs of loamy soil enriched with decayed manure. During the summer months the oleander requires an abundance of water, and must be fully exposed to the sunshine in order that the stems may be well ripened. The oleander often fails to bloom well because of the neglect to remove the shoots, while they are small, that develop at the base of the flower buds. If allowed to remain they grow and the flower buds perish. This shrub flowers most freely when well rooted in the pot or tub; weak liquid manure should be given occasionally in summer.

OLEARIA. This is the name of a group of evergreen shrubs of which the favourite kind is *Olearia Haastii*. This reaches a height of 3 or 4 ft. and bears white daisy-like flowers in August. It makes a useful ornamental garden hedge as it is of compact growth. *Olearia stellulata*, 2-3 ft., bears white flowers in early summer; it blooms very freely in a sheltered place in mild districts, but it is less hardy than *Haastii*. *Olearia macrodonia*, a more vigorous shrub, is suitable only for the milder counties of England. These shrubs need no pruning other than that required to keep them shapely, which should be done after flowering. Propagation is by cuttings in a frame in summer.

OLIVE : The Shrub. A group of evergreen trees and shrubs is called the olive. It includes the common olive (*Olea europaea*), which is a distinctive feature of the landscape in southern Europe, and may be grown in this country only in mild places or against a wall in other gardens. The olive oil of commerce is obtained from the fruits. Propagation is by means of cuttings or seeds.

Uses of the Fruit. The green fruit of the olive yields olive oil, and is also pickled and sold in bottles and tins for cooking purposes. The oil, which is contained in the flesh, and not in the stone of the olive, is the very finest which can be used for all purposes of cookery. It is excellent for dressing salads, frying, making light batters, and for preparing entrées.

Stuffed olives make an appetizing dish for hors d'œuvres. Spanish olives should be used, as the Italian variety is small and more oily to taste. Various mixtures can be prepared for the filling, which must be of a savoury character, or a savoury butter can be used. To prepare the olive for stuffing or cooking by other methods, it must be sliced or turned. To do this, start from the top and pare it round and round, using a small, sharp-pointed knife and shaping it like a spiral. Keep the knife close to the stone all the time to avoid losing the flesh. After the stone is removed and the filling inserted, form the olive into its correct shape again. A special fruit stoner, which is scissor-shaped, holding the olive in a metal cleft and ejecting the stone by means of a plong, can be obtained cheaply. The stuffing is inserted in the cavity.

A good way of preparing these savoury olives is to fill them with anchovy butter and

serve them on small, thin rounds of bread and butter, each about the size of a two-shilling piece. Shell 2 or 3 hard-boiled eggs and separate the whites from the yolks, chopping up the former and rubbing the latter through a sieve. Spread some of the yolk on the rounds of bread and butter, press an



Olive Savouries, made with hard-boiled eggs, olives and small rounds of bread and butter

olive on each in an upright position, and garnish with the chopped white.

Olives à l'indienne provide another way of preparing stuffed olives. Cut a hard-boiled egg into halves, remove the yolk, and slice the white into rings. Pound the yolk with 1 oz. butter, a teaspoonful of mustard and 2 oz. chutney, and use this mixture for filling the stoned olives. Cut some brown bread into small rounds, spread any remaining stuffing over them, place a ring of white of egg on each, and put an olive in the centre. Arrange them on a glass or silver dish. *See Anchovy Butter; Hors d'Oeuvre.*

Olive Oil. By pressing the ripe fruit of the olive tree olive oil is obtained. It is a valuable food, and is also a mild aperient. For people who suffer from mild constipation, a tablespoonful taken every night will often prove most beneficial. As an emema it is very useful for constipation with the presence of hardened faeces in the bowel. Large quantities are sometimes given to people suffering from gall stones. For burns and scalds, olive oil is one of the best remedies for immediate use when the skin is not broken.

OLIVINE. The word *olivine* is used to describe a large number of stones of the semi-precious variety, among which are the chrysolite and peridot. Usually they vary in colour from straw-yellow to dark yellowish green, but the best specimens are of a rich green hue.

OLLA PODRIDA. The Spanish national dish known as *olla podrida* consists of a stew made with fresh and salt meats, poultry, and vegetables, all cut small and highly flavoured with garlic and pepper. The whole is stewed for a considerable time in a closed pot or jar.

OMELETTE. An omelette is a preparation of eggs fried in a pan with butter or other fat, and served as a sweet or savoury. Success depends largely on the dexterity with which the pan is handled as well as on the quality of the ingredients and the way in which the eggs are beaten. The yolks and whites should be well mixed but not frothed except in the case of the soufflé varieties. The best pans for the purpose are those with slightly sloping sides, and the pan must not be either too thin or too large. If it is too thin the omelette will burn before it is cooked through, and if it is too large the mixture will spread like a pancake. The omelette pan should be kept for omelettes only, and should not often be washed out. Rub it with soft paper to clean it. The eggs should be new laid, or as fresh as possible.

If a savoury omelette is made, with the addition of meat or fish, this must be ready cooked and seasoned and all bones removed. When the omelette is nearly finished the savoury mixture is laid on it, and the sides folded over with a flexible or palette knife. Cheese or fine herbs are mixed in with the eggs. For kidney omelettes the kidney is first chopped up finely and cooked 10-15 minutes in fat before putting in the centre of the

plain omelette. If shallots are used they must always be chopped and fried first of all. Three or four eggs may be cooked in a 7-in. pan, and 2 eggs should be allowed for each person.

The most approved method for making omelettes is to heat 2 oz. butter or other fat till smoking hot, then pour in 4 eggs well beaten and seasoned if for savoury omelette. Stir them and as they begin to set and brown underneath, fold over the side of the omelette near the handle of the pan into the middle, then fold over the other side, making an oval cushion shape. Add meat, fish, kidney, mushrooms, etc., before folding, for a savoury omelette. Turn it on to a hot dish.

Sweet Omelettes. These are made and fried as savoury omelettes, but $\frac{1}{2}$ oz. sugar is added to the eggs instead of seasoning, and jam is laid on the omelette before folding. When dished, sugar should be sprinkled over. Use a stiff kind of jam. Lemon omelettes are made by adding lemon curd instead of jam. For rum omelettes the spirit should be poured over just before serving, and lighted.

A good-sized omelette can be made by breaking 2 eggs into a basin, beating them slightly, and then adding $\frac{1}{2}$ tea-spoonful of chopped parsley, and some salt and pepper to taste. Melt $\frac{1}{2}$ oz. butter in an omelette pan, pour in the egg mixture, stir it for a few seconds, and as it sets, lift it up and allow the liquid portion to flow to the bottom of the pan. Lift this again, and then double the omelette over and slip it on to the paper doily arranged on a hot dish. The omelette should be quite soft and flaky in the middle. It can be varied by adding a table-spoonful of grated cheese, chopped cooked ham or meat, or cooked and seasoned tomato, or cooked fish, flaked and seasoned, or cooked mushrooms, immediately before it is doubled over.

Friars' Omelette. This is made with a puree of apples sweetened and flavoured, then butter and eggs mixed in. $1\frac{1}{2}$ lb. apples requiring 2 oz. butter and 2 eggs. Grease a baking dish and coat it with a thick layer of breadcrumbs. Pour in the puree, cover it with another thick layer of crumbs, strew over it small pieces of butter, and bake it for 15 min. in a moderate oven. Serve the omelette with cream and sugar. It will be found sufficient for 4 persons.

ONIONS: IN GARDEN AND KITCHEN

The Growing and Cooking of this Useful Vegetable

For additional information on this and kindred subjects see the article Kitchen Garden and Olive Flavouring. Garlic, Goose, Leek, Pickles, Shallot, Vegetarian Cookery.

The culture of this vegetable is not difficult if the soil is suitable, but for good results a deep rich loam is necessary.

In preparing the soil, the best manure is undoubtedly well rotted stable manure, applied to the ground in the autumn before cultivation commences. Soot, soon after sowing, and nitrate of soda when the plants make their appearance, are also recommended as stimulants. A dressing of salt applied a fortnight before sowing, and dug in if the ram has not already washed it in, is also a useful aid if the soil is light, cow manure is necessary.

The main crop of onion seed should be sown in March, choosing a day when the ground is as dry as possible. It should be put in in drills or rows about 9 in. or 1 ft. apart, and lightly covered with soil. After sowing, however, the surface of the soil must be dusted with soot, and pressed down firmly by a light roller.

A second sowing of onions should be made in August, when the method of procedure is similar. As soon as the young onions are large enough they should be thinned out. The thinnings are useful as spring onions; the plants should be left at 6 in. apart.

For pickling onions, seed may be sown in May, in poor soil. Thinning need not be drastic, and the bulbs will be ready for pulling by the

Omelette Soufflé. To make omelette soufflé, work together the yolks of 4 eggs and 3 oz. castor sugar until they form a thick yellow cream, then add $\frac{1}{2}$ oz. flour, $\frac{1}{4}$ tea-spoonful vanilla, and 6 stiffly beaten whites of eggs. Pour the mixture into a well-greased au gratin dish and bake it in a moderate oven for 10-15 min., or until it is pale brown in colour and spongy to the touch. Dust it with castor sugar and serve it immediately. A little jam may be put in the centre of the soufflé before it is baked. *See Soufflé.*

OMPHALODES. These are annual or perennial plants with forget-me-not like flowers. Most of them are suitable only for the rock garden. The chief kinds are: *cappadocica*, 12 in.; *nitida*, 12 in.; *verna*, 6 in.; and *lucida*, 6 in. All have blue flowers. They need slight shade and well drained, gritty, sandy loam. During winter they should be protected by pieces of glass raised a few inches above them to keep off excessive rain. Propagation is by seeds sown in spring. *Omphalodes limifolia* is a hardy annual, 8-10 in., which bears white flowers. Seeds are sown in the rock garden in spring for summer flowers. All bloom early in summer.

ONCIDIUM. This is the name of a showy group of orchids some of which must be grown in a hot house, while others flourish under the same conditions as *Odontoglossum* (q.v.). The prevailing colour of the flowers of many kinds is yellow with reddish-brown markings. The plants must be watered sparingly after the year's growth is finished. *Kramerianum* and *papilio* are favourite sorts for the hot house; *concolor*, *varicosum*, and *marshallianum* are among those suitable for the cool house.

ONE STEP. The one step is similar to the quickstep in construction, but is danced to 2-4 instead of common time. Some of the steps in this dance may be used in the one step, but owing to the quicker time the simplest ones are best. The dancing should be very smooth. The three-step turn is used, that is, turning on every third step, both to the right and reverse. As in the quickstep, the man begins with the right foot and the girl with the left. *See Dancing; Fox Trot; Quickstep.*

The crop of ordinary onions will be ready for handling about the middle of September, when they should be taken up, cleaned, and put in a dry shed or sunny position in the open air, if the weather is favourable, until they are ready for storing.

There are many different sorts of onion. *Ailsa Craig* is one of the best as regards shape, size, flavour, and keeping properties. Others for various uses are *Lemon Rocca*, *Giant Rocca*, and *Tripoli*, usually sown in August. *White Spanish*, *Nuneham Park*, *James' Long Keeping*, *Premier*, and *Cranston's Excelsior* are suitable for spring sowing.

Gathering the Onions. The time which is best for gathering onions is about the middle of September, when the tops begin to wither and the plants can be pulled up easily. They must be laid out to dry in a cool, airy place, and then made up into reeves. This is done by fastening the tails together with a strand of matting, and forming them into a rope with the onions appearing in even rows all along. This rope should be about 1 yard long, and is called the reeve. It can be hung in a corner of the larder for convenience. Onions keep better when reeved.

Diseases of Onions. One of the chief diseases of onions is known as the white rot. In some



Onion. Well-grown bulbs of a variety of this useful and nutritious vegetable

parts of England it is called mildew and in Bedfordshire it is mouldy nose. In Leaflet 62 the Ministry of Agriculture deals with the best method of combating the disease. Widely distributed throughout the country, it is specially common where onions have been cultivated for a long time. During the early months of summer it causes much destruction, both to spring and autumn sown plants.

Onion Pests. The worst trouble with which growers have to deal is the onion maggot, which may ruin the young plants if not checked or destroyed. In some gardens the crop is more liable to serious attack than in others. When the seedlings are thinned out care must be taken to tread the soil firmly alongside the remaining plants. Sawdust soaked in paraffin and scattered alongside the rows helps to keep away the onion fly, and frequent dustings of soot are helpful. Flaked naphthalene scattered along the rows is another deterrent. Seedlings which are attacked by the maggot should be uprooted and burnt. An occasional sprinkling on the soil of nitrate of soda or sulphate of ammonia, 1 oz. to the yard run of row, stimulates the growth of the seedlings and thus does good. Mildew often attacks the onion crop. Badly affected plants should be burnt and the other sprayed with a solution of liver of sulphur, 1 oz. in 2 gallons of water.

The Cooking of Onions. By the cook the onion may be regarded equally as a vegetable and a condiment, and is, in fact, almost indispensable as an adjunct to soups, stews, and made dishes of all kinds. When eaten raw it is nourishing and stimulating, but difficult to digest. Much of the pungent property of the onion is dispersed by boiling, and if blanched before the actual cooking commences it is much less likely to disagree, and forms, to most tastes, a pleasanter and milder vegetable.

When roasted, the onion should be previously blanched or parboiled, and it will be more wholesome and lose some of its richness. Fried onions, also, might with advantage be subjected to this treatment.

The small round onion is the correct kind to use for making pickled onions or for mixing with other vegetables for this

purpose. Spanish onions are in season in the autumn and winter, when they are imported in a dry state. The Spanish onion is much larger than the British variety, and is better for serving as a vegetable and also for roasting. Being milder in quality, it has not the pungency that is required for flavouring soups and stews. Other varieties of the onion used in cookery are leeks, shallots, chives, and garlic.

Onions leave a most pungent and unpleasant odour on any cookery utensils used in their preparation. Table knives and forks, also, if onions form part of the menu, require special cleansing; this applies particularly to onions served in a raw state, as in salads, etc. The forks should be cleansed in hot soda, with a small piece of whiting in the water, and may be rubbed lightly with cut lemon; if so, they must be rinsed before being wiped. The knife blades, after washing, should be thrust into earth or coffee grounds and then rinsed, wiped, and cleaned as usual.

The board on which onions are cut should be rubbed with vinegar or lemon before being scrubbed. Silver should be sprinkled on the board before the brush is applied.

Never use a pastry board in preparing any kind of vegetable; a distinct board must be kept for this purpose. It is better, also, to keep one knife only for onions, and to mark it in some manner that can be easily recognized. To remove the odour and stain of onion from the hands, rinse them well in cold water, and rub with cut lemon or pumice-stone before washing them with soap.

Braised Onions. To braise onions, remove the skins from medium-sized Spanish onions. Heat a piece of butter or good beef dripping and fry the onions (whole) lightly on all sides. Then pour in brown stock or gravy to come half-way up the onions, season with pepper and salt, and let them cook gently in the oven or on top of the stove until tender when tested with a fork or skewer. Then thicken the stock with a little flour or cornflour and pour over the onions to serve.

Roasted or Baked Onions. Remove the untidy outer skin from the onions, but do not peel them. Put them, with their skins on, into boiling salted water and let them boil quickly for an hour. Then take them up, dry them, and wrap each in a piece of buttered paper, and bake in a moderate oven about

two hours or until tender. They may be served in their skins and melted butter handed with them; or peeled, with oiled butter or brown sauce poured over.

Onion Sauce. This sauce is served usually with roast mutton or boiled rabbit. When apple sauce does not accompany goose or ducks onion sauce may take its place. It forms sometimes a garnish for cutlets or, if made rather thicker, a coating.

To make it, boil till tender 1 lb. onions. Peel and blanch them, then drain and chop very fine. Put 1 pint milk into a bright saucepan, add onions with 1 tablespoonful flour mixed in with them. Bring all to the boil, stirring to keep the sauce smooth; add 1 oz. butter and seasoning of salt and pepper. Simmer it for 5 min. and serve very hot.

Onion sauce for an entrée is prepared thus: Peel and boil in salted water 1 lb. onions. After 55 min. pour off the first water and boil till tender in fresh water; drain and chop very fine. Return them to the pan with 2 oz. butter, 3 oz. flour, 1 pint milk, 1 gill cream, and seasoning. Simmer for 10 min., then pass through a hair sieve or a tammy cloth.

Onion Vinegar. All that is required to make onion vinegar is to steep 1 oz. of chopped onion and shallot in 1 pint of white wine vinegar for a fortnight. This condiment gives a piquant flavour to salad dressings and mayonnaise.

Medical Uses. Boiled Spanish onions, taken freely, are said to benefit people suffering from boils. A poultice made of onions is an old-fashioned remedy often used to hasten the breaking of a boil. To use in this way, roast the onions, and mash them before spreading on a piece of muslin or linen and applying to the spot. Both onions and garlic are slightly aperient and diuretic.

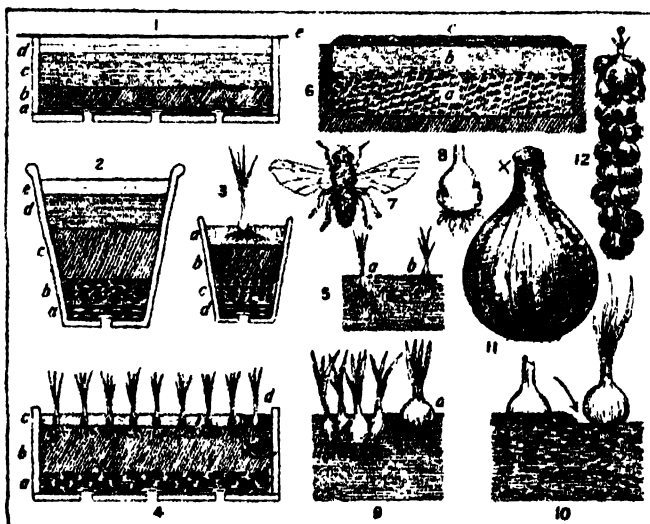
Onion Sellers. In the autumn, generally in October, the onion sellers from Brittany arrive in Great Britain and may be seen at all coast towns and villages, and even far inland, going from door to door, offering their wares for sale. These consist of strings of French onions slung from long poles which the Breton fishermen carry on their shoulders.

These onions are somewhat milder in flavour than those which are grown in British soil, and consequently they are of practical use to many housewives for the preparation of dishes in which onions form an ingredient, especially when only a mild flavouring is desired. The Breton onions are plated together in strands, a convenient arrangement for hanging up in the pantry or from the rafters of country kitchens. They are specially good for flavouring soup.

ONONIS. This is a low-growing hardy shrub or herbaceous perennial which bears pea-shaped flowers in summer. The pink flowered rest harrow (*Ononis spinosa*) is a British plant. Some of the best kinds for gardens are *fruticosa* and *rotundifolia*, with rose pink blooms, and *aragonensis*, yellow, which reaches a height of 18 in. or so. They need well-drained soil and a position fully exposed to the sun; they are usually grown in the rock garden. Propagation is by cuttings in a frame in summer or by sowing seeds. It is important that the shoots should be shortened after flowering.

ONOPORDON. This giant thistle-like plant is suitable for the wild garden, edge of the woodland, or the back of a large herbaceous border. They reach a height of 6 ft. or even 8 ft. in good soil, and have pale purplish flower heads. One of the best is *Onopordon acanthium*, known as the Scotch thistle. They are raised from seeds sown out of doors in spring.

ONOSMA. This is the name of an important race of rock-garden plants. The species demand hot and dry positions, with



How to Grow Onions. 1. Seed sowing in box; a, crocks; b, leaves; c, compost; d, fine sandy soil; e, glass. 2. Seed sowing in pot; a, crocks; b, leaves; c, rough soil; d, compost; e, sandy soil. 3. Exhibition growing; a, sandy soil; b, rich compost; c, leaves; d, crocks. 4. Transplanted seedlings; a, rough soil; b, compost; c, sandy soil; d, how to lift for planting out. 5. Planting; a, wrong; b, right. 6. Soil preparation; a, good manure or vegetable refuse; b, top soil; c, top dressing of soot, wood ashes and soil. 7 and 8. Onion fly and its result. 9. Thinning; a, fine bulb resulting. 10. Soil clearing to mature bulbs. 11. Top tying for exhibition. 12. Rope of onions for storing.

light, well-drained loam and a little lime. The plants are of varying heights, ranging from mere inches to a foot or so. One species, *Onosma taurica*, is the old garden favourite golden drop. But there are lesser known and equally attractive kinds including alba-roseum, white, changing to pink, and taurica, yellow.



Onosma. Bell-shaped flowers of this well known rock garden plant June onward, and can be raised from seed or propagated by cuttings. Protect in winter by raised pieces of glass. See Golden Drop; Rock Garden

ONYX. A variety of tinted agate, onyx is formed of alternative layers of white and coloured chalcedony. It is used in jewelry for bead necklaces, and fancy ornaments. Black onyx is used with diamonds in rings, pendants, and other ornaments. See Jewelry.

OOLONG TEA. Oolong is a black China tea somewhat resembling in flavour a green tea, and of a rather light character. Oolong teas are sometimes exported from Japan. See China Tea; Tea.

OPAL. The most costly of these gems are known as precious opals, and have rainbow-like tints of pink and red; fire opals are of a rich orange-red colour, while cat's eye opals, which are rare and usually of a green colour, have in their centre a wavy line similar to that in a cat's eye. Other kinds include the black and the common opal. The latter is the least valuable. Opals are cut in cabochon form and never into facets. They combine especially well with diamonds or silver. See Jewelry.

OPERA GLASSES. It is desirable that the selection of opera glasses should be made by the person who is going to use them. Those with bending bars in the middle, so that they can be adjusted to the width between the eyes are a convenience; also it is desirable to have large diameter lenses in both the object glasses and eye pieces. The



Opera Glasses fitted with long handle to facilitate holding

advantage of the larger lenses is that they allow more light to enter the eyes, and therefore in a theatre the visual results are better.

Opera glasses should not be selected of too high a power, because if it is so, not only is the light reduced, but the field of vision is greatly curtailed. Opera glasses are sometimes covered with leather, pearl, tortoiseshell, and ivory; fancy glasses are

made with small lenses to keep down the weight. The aluminium pattern enables glasses with large lenses to be practically the same weight as others with small lenses.

Opera glasses are made so that very little dust can penetrate, and with ordinary use they should last many years without being touched inside. When they have to be cleaned on the inside all that is necessary is to unscrew the cell which holds the lens and wipe it lightly with clean chamois leather, which will not scratch or injure it. The lenses should be taken out one at a time, cleaned and replaced; this ensures their going back in their original position. The outside surfaces should be cleaned with chamois leather. The lenses ought not to be touched except when they require cleaning, as small particles of grit are liable to get on the surface of the glasses and will greatly impair their value.

The usual magnification of opera glasses is about 2½ diameters. A simple way to judge the magnification is to look at a brick wall through the glass with one eye only, but keeping both eyes open. The image seen through the glass will cover the space of 2½ bricks which are seen with the other eye.

Ophioglossum. This is the botanical name for the adder's tongue fern (q.v.).

OPHYRS. Some wild orchids of Great Britain are called by this name. The favourites are the bee orchid (*apifera*), purplish and green; spider orchid (*aranifera*), brown and green; and fly orchid (*muscifera*), green and reddish. They are all low-growing plants which flower in early summer. They should be planted in the rock garden in slight shade, in loamy, chalky soil.

Ophthalmia. See Conjunctivitis

OPIUM. The dried juice obtained by cutting into the unripe capsules of the white poppy (*Papaver somniferum*) is a useful remedy in medicine. Crude opium contains a number of alkaloids, of which morphine, which may be present to the extent of 12 p.c., is the most important. Opium acts as an anodyne and narcotic almost entirely in virtue of the morphine it contains. It is used

in various forms to relieve pain, and in the treatment of insomnia, but should never be given except under medical supervision. It is definitely dangerous to young children.

Symptoms of opium poisoning are loud and laboured breathing, hvid lips, cold and clammy skin, and slow pulse. Unless the patient receives immediate treatment, the breathing becomes weaker, convulsions supervene, and death may ensue from asphyxia. The best antidote to opium poisoning is 10 grains of potassium permanganate to one pint of water. After this is taken, plenty of strong coffee should be given, and the patient must at all costs be kept awake. If, in spite of all precautions that can be taken the patient falls into a coma, artificial respiration should at once be applied.

OPIUM POPPY

This is a very showy and easily grown hardy annual (*Papaver somniferum*), of which there are several coloured varieties, e.g. The Mikado, Cardinal, White Swan, and Carnation-flowered. The plants grow 18-24 in. high, and have greyish leaves. Seeds are sown out of doors in March-April where the plants are to bloom in summer. The opium of commerce is obtained from *Papaver somniferum*.



Opium Poppy. Showy bloom of this brilliant hardy annual

OPOSSUM: The Skin. There are two varieties of opossum, one of a delicate bluish-grey colour and the other a hard, wiry fur of a brownish shade, known as American opossum. Both kinds are used for trimming purposes, especially on winter coats of velvet cloth. See Fur.

OPTICAL LANTERNS IN THE HOME

The Nature and Use of Projection Apparatus

The reader is referred from this article to those on Lantern Slide and Lens, where related information will be found. See also Enlarging

The optical lantern is generally understood to be a modern form of magic lantern, taking the standard 3½ in. square slides and having an improved optical system with an efficient and powerful source of illumination. The lantern most frequently consists of a well-ventilated box of wood or metal in which is an illuminant with a reflector behind it. Opposite the light is a condenser, which is an arrangement of one or more large lenses. Its purpose is to collect the light rays and throw them through a lantern slide placed on the other side of the condenser. The picture is thus cast into the front lens, usually called an objective, which focusses the picture and throws it in a highly magnified form upon a screen.

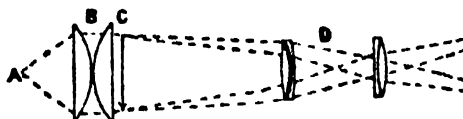
For home work the common form of japanned tin or Russian iron lantern, burning oil, has been very popular, but acetylene, spirit, electric and other illuminants have displaced the oil lamp. Many of the modern electric lanterns are specially suitable for the

any form of illuminant that may be convenient. The actual lantern remains the same, but the chimney and internal arrangements will depend upon the kind of light used.

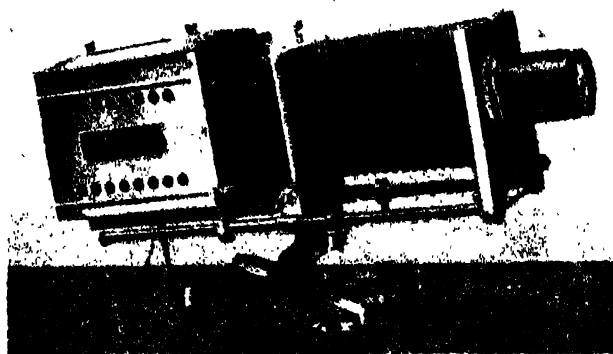
Bi-unial (double) and tri-unial (triple) lanterns are used for dissolving views. A lantern-slide picture is projected in the usual way by one of the lanterns upon the screen; the second picture is then shown over the first one upon the screen, when the first one is made to fade out, usually by lowering the light. In this way day scenes are made to dissolve into night scenes and summer scenes into winter scenes.

The Optical System. Standard lanterns have condensers measuring 4 in. to 4½ in. in diameter. The circular condenser must be at least 4 in. in diameter to illuminate the standard 3½ in. square slide. The condenser consists usually of two lenses, called a plano-convex compound, mounted in a cell with the flat surfaces outward. A condenser should never be suddenly heated or allowed to cool

too rapidly, because of the danger of cracking. The lenses should fit loosely in the cell, and the latter should be provided with suitable holes for



Various parts of the optical system. A, illuminant; B, condenser; C, slide stage; D, objective



ventilation. The heat generated during a show causes the glass to expand slightly, and if this expansion is not allowed for the glasses will crack.

The objective is often a lens of the Petzval type, like a photographic portrait lens; it is generally about 2 in. in diameter and from $\frac{1}{2}$ in. to 6 in. in focus. Upon the focus of the lens depends the size of the picture upon the screen; or, in other words, the distance of the lantern from the screen.

The $\frac{1}{2}$ or 6 in. focus lens is commonly supplied with lanterns for use at home gives approximately, a 5 ft. picture 10 ft. from the screen, a 6 ft. picture at 12 ft., a 7 ft. picture at 14 ft., and so on, the picture being half as high as the distance measures. For large halls,

objectives of longer focus are used. Thus with an objective of 12 in. focus the lanternist would get, using the same lantern and condenser, a 21 ft. picture at 10 ft., and a 3 ft. picture at 12 ft. Put in another way, if the lantern is 12 ft. from the screen, then a 4 in. objective would give a 9 ft. picture, a 5 in. one of 7 ft., a 7 in. one of 5 ft., and an 8 in. a picture of 4 ft.

The size of picture obtainable depends upon the quality of the light employed. With an oil lantern it is rarely possible to enlarge the 3 ft. slide to more than 5 ft. and get at the same time a brilliant picture. It is better to have, say, a 4 ft. bright picture than a dull one of 6 ft. in diameter. With incandescent gas or acetylene good 6 ft. picture are possible if the illuminants work well. With the electric gas filled lamps now generally used, 8 ft. can easily be obtained.

The Screen. The screen upon which the pictures are shown deserves more attention than is usually given to it. If the best results

are wanted, it is not enough to hang up an ordinary white linen or calico sheet and project the picture upon it. A lantern sheet or screen should be quite white and absolutely opaque. Opacity is necessary to keep the light and the picture upon the surface and so reflect rather than absorb it. When an ordinary sheet is used much of the light cast upon it goes through and is lost, the picture suffering from lack of brilliancy and clearness of outline

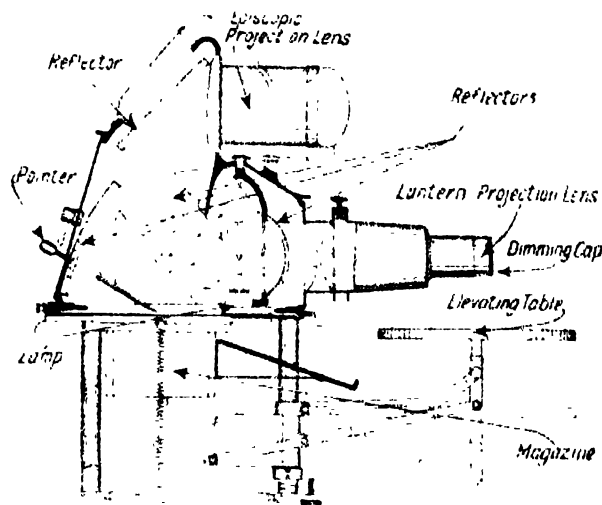
of the globe is silvered to act as a reflector. The bellows extension permits the use of lenses having a focus of 8 in. to 18 in., giving a distance from the screen of 20 ft. to 75 ft., according to the lens employed. This model is particularly suitable for lecture halls or classrooms, but a smaller one, designed on similar principles, is available for home entertainment.

Projection of Opaque Objects. At lectures demonstrations, etc., it is often necessary to show an enlarged image of an opaque object, such as a picture, diagram, or page of letter press from a book. An optical lantern for projecting on to a screen the image of an opaque object is known as an episcopes. Such an apparatus is generally, however, designed to show transparent slides also, when it is termed an episcopes. The opaque object is placed on a platform beneath the apparatus, and is illuminated by one or more powerful electric lamps. The light rays reflected upward from the object are passed through a lens system and projected on to a screen. We illustrate a type of episcopes in which one objective is used for the dual purpose, the movement of a lever converting it from episcopes projection to lantern slide use, and vice versa.

OPTICIAN. A person who makes or sells spectacles or other optical instruments is called an optician. A doctor who specializes in disorders of the eye is an oculist, and his work deals very largely with errors of refraction, for which glasses have to be prescribed. Many opticians also test vision and prescribe glasses where these are necessary.

People who have little knowledge of optical work, and who are in no sense opticians, frequently undertake to supply glasses, which may be either unnecessary or actually harmful. The bona fide optician is skilled in making up and fitting glasses; he is dependent on supply lenses of the precise kind and strength required. He also may have skill in sight-testing, and amongst opticians there are many who have qualified for a diploma in the subject. See Eye, Sight Testing.

OPUNTIA. The cactaceous plant called opuntia includes the Indian fig, prickly pear, Barbary fig, and other natives of Central America. Most of them need ordinary treatment in the greenhouse in rich loam, with a liberal admixture of lime or old mortar; they must be watered sparingly in winter. The hardy species need similar soil in a sunny, sheltered situation in the garden. Propagation is by seeds or cuttings. Among the hardy kinds are monanthus and rathnesque. See Indian Fig; Prickly Pear.



Optical Lantern. Top, electric projection lantern for lecture hall or classroom, adapted for lenses of 8 to 18 in. focus. Lower, Aldis Episcopes for projecting opaque and solid objects, shown in part section. This apparatus gives a circular projection of up to 12 ft. 2 in. diameter for photo. lens of 8 in. focus. 100.

The best screen on which to show lantern pictures—small and large, is a whitewashed or distempered plaster wall, which absorbs no light—for the same reason white cardboard is also excellent. Opaque screens of a size large enough for home work are to be had from the makers of lanterns and accessories.

The aluminum lantern illustrated is one of a class developed in recent years. It has a superior lens system, and the illuminant is a 500 watt electric lamp which can be connected to the house lighting circuit. The back

ORANGES AND ORANGE DISHES

A Popular and Health-giving Fruit in Appetizing Forms

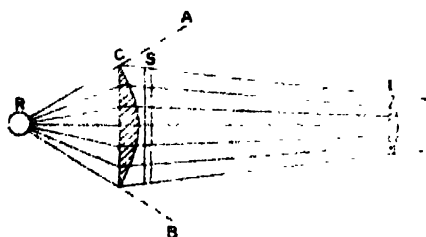
Marmalade is one of the entries in our work to which reference should be made; others are Candied Peel; Crystallized Fruit. See also Diet, Fruit; Iceing; Jelly; Tangerine.

The orange is an evergreen flowering shrub belonging to the Citrus family, which embraces the lemon, tangerine, grape fruit, and citron, as well as the Seville or marmalade orange. Oranges may be grown from pits planted in pots in loamy soil. The temperature of a cool greenhouse is all that is necessary, and the pots or tubs may be stood out of doors on verandas or in porches during the summer months. The small Otaheite orange is the best fruiting variety for amateurs. Seedling plants are slow in reaching the fruiting stage.

Chief Varieties. Of the two main varieties of this fruit, sweet oranges are used for eating and dessert purposes, while the bitter sorts are employed chiefly in making marmalades. There are a large number of varieties of the sweet orange, each having its characteristic. The fruit which comes from St. Michael in the

Azores has a specially choice flavour and is juicy and seedless. Majorca also produces seedless oranges, while Malta is celebrated for its blood oranges, the pulp being of a dark crimson colour and very sweet and juicy. The Lisbon variety has a thick rind like that of Jaffa, while the China orange is thin and the juice very abundant. The rind of the Mandarin is thick, heavy, and loosely attached to the pulp, the fruit being of excellent flavour. Tangerines are amongst the smallest of oranges, being flat in shape and possessing an aromatic flavour.

Sweet oranges are imported from Alicante and other parts of Spain, but the most important variety from this country is the Seville orange, which is extremely bitter in taste, and dark coloured with a rough skin. Sweet oranges of good size and excellent



Optical Lantern: action of condenser lens. R, source of light; A and B, normal path of light ray, if no condenser is used; L, objective lens on which the light rays are made to converge by the condenser lens C; S, slide.

quality, both seedless and other kinds, are grown in Australia and South Africa, and are on sale in most towns in Great Britain. One of the largest varieties is the American navel orange, so called from a characteristic formation on the top of the fruit, which is oval in shape. This variety of orange is also grown in South Africa.

Amongst the many uses of the orange, the fruit may be preserved in sugar as a sweetmeat. The peel of the bitter orange is candied and is much employed in confectionery. In an early stage the small green fruit, no larger than berries, is used in the manufacture of the liqueur known as curacao. The bergamot perfume is distilled from the rind of Italian oranges, and a liqueur named rosoglio is also made in some parts of Italy from oranges. An essential oil is obtained from the rind of both sweet and bitter oranges, and is sold by most perfume dealers.

Medicinal Value. Both sweet and bitter oranges are used in medicine, but chiefly the latter, which are of great value in the sick room. Only the juice, however, should be given to invalids or young children, as the pulp is very difficult to digest. Squeeze the orange juice into a glass and give in that way. A teaspoonful of orange juice should be given once or twice a day to hand-fed babies to prevent scurvy, for which it is also a remedy.

For a patient who is thirsty, a welcome drink can be made by pouring over the thinly cut

peel of an orange a pint of nearly boiling water. Add 4 tablespoonfuls loaf sugar and let it stand for an hour; then put to it the juice of 3 oranges, and strain. Serve quite cold.

An excellent tonic for promoting appetite and aiding digestion can be made by taking 2 oz. dried orange peel, the fresh rind of 2 lemons, and pouring over them 1 pint boiling water. Let it stand for an hour, then strain. Take $\frac{1}{2}$ wine glassful twice a day, half an hour before luncheon and before dinner.

From the flowers of the orange a water is distilled which has a beautiful perfume. Besides this, other preparations of orange used in medicine are the tincture and the syrup, the dose of each being $\frac{1}{2}$ to 1 dram; these both act as flavouring agents, and the tincture also as a tonic and appetizer.

Uses in Cookery. Oranges are a very useful cookery ingredient and can be employed in a variety of dishes, such as pies, tartlets, creams, jellies, cheese cakes, cakes, and salads. The flavour is delicious in icings and sweet fillings, and the juice is in some cases added to rich, made gravies.

Orange Basket. The sweet known by this name is made by cutting 2 or 3 ripe oranges into halves, scooping out the pulp and mashing it up in cold water, making about $\frac{1}{2}$ pint liquor in all. Add sugar to taste, and after letting the

liquor stand for a couple of hours, strain it through muslin.

Add $\frac{1}{2}$ oz. isinglass and just warm the whole until the isinglass melts. Colour it pale pink with a little cochineal, and then pour it into the halved orange skins, leaving these in a cool place to set. When the jelly is firm, handles to complete the basket-like effect can be made from thin strips of angelica, bent over.

Orange Biscuit. Boil 6 Seville oranges in 2 or 3 waters till the bitterness has almost disappeared. Cut them in quarters and remove all the inside. Beat the peel very fine in a mortar then weigh the pulp thus obtained. Add an equal weight of castor sugar and work both to a firm paste. Spread it smoothly on a dish or tin, set it in a cool oven to dry, and when dried sufficiently to shape cut it into fingers. Dry these again, turn them upside down, and return them to the oven so that all moisture may be absorbed. Store them in tins. These biscuits should be about $\frac{1}{2}$ in. thick, and are useful as wafers to serve with ice cream.

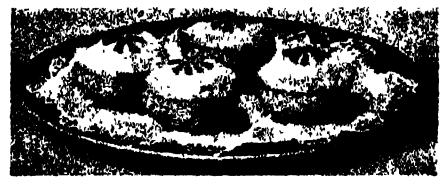
A spongy biscuit can be prepared by beating 2 eggs with 4 oz. castor sugar until thick and quite light. Mix in the grated rind of an orange with 1 teaspoonful orange flower water. Sift 4 oz. flour with a pinch of salt and fold it into the sponge. Bake it in little paper cases, and when almost cooked dredge it with sugar. Finish baking afterwards. These biscuits are sometimes iced, and in that case the icing should be mixed with some of the orange-juice.

Orange Cake. A sandwich cake flavoured with orange can be made by beating $\frac{1}{2}$ teaspoonful butter or margarine and 2 teaspoonfuls sugar to a cream, adding separately 2 eggs, and then beating the mixture well. Pour in $\frac{1}{2}$ teaspoonful milk, then add 1 lb. sieved flour, grated rind of the orange, and 1 teaspoonful baking-powder, and continue beating.

Line a tin with greased paper, put in the mixture, and bake it until it is firm and lightly browned. When cold, split it into two and spread the sides with a gill or more of whipped and sweetened cream, flavoured with orange essence.

Another cake filling is made by mixing the strained juice of 2 or 3 oranges with $\frac{1}{2}$ lb. cast. sugar, gradually adding to them the grated rinds, 2 tablespoonfuls cornflour, and a gill of water. Mix all to a smooth paste then stir in 1 oz. melted butter, and stand the basin over a saucepan of hot water. Stir its contents until they become creamy and taste cooked; then leave them to cool. When cold stir in the whites of 2 eggs, and spread the filling over the cut sides of the cake, afterwards putting the latter together again. If it has risen too much in the centre, level it with a knife before icing.

Orange Cream. To make this sweet, cut 2 oranges into halves and remove the pulp carefully, so as not to split the rinds. Extract the pips, rub the pulp through a fine sieve and mix with it 3 dessertspoonfuls castor sugar. Whip a gill of cream until it thickens, add half of it to the orange pulp and sugar and fold in also the stiffly whisked white of an egg. Dissolve $\frac{1}{2}$ oz. leaf gelatine in $\frac{1}{2}$ gill water, strain it into the other ingredients and mix all thoroughly. Half-fill each orange-case with



Orange Cream, halved orange skins filled with a cream mixture and decorated with angelica

the mixture, and when the latter is set, decorate the top with the remainder of the cream and a few pieces of angelica on top.

Orange Fool. Peel and then mash 3 or 4 large oranges to a pulp, rub the latter through a sieve to rid it of pips, and then mix it with 1 pint custard. Let the mixture stand in a cool place so that it may thicken, then put it into custard glasses and pile a little whipped cream on top of each. If preferred, $\frac{1}{2}$ pint cream may be substituted for the custard.

Orange Fritters. These are made by peeling some oranges, breaking them into quarters, removing the white skin, and then sprinkling them with castor sugar. Leave them thus for about 15 min., then drain and coat them with frying batter. Have ready a pan of smoking, hot fat, put in the slices of orange, and fry them till they are a golden brown. Drain them from the fat, dredge them with some more castor sugar, and serve at once. Allow half an orange for each person.

Orange Pudding. A small orange pudding can be made by mixing together $1\frac{1}{2}$ oz. castor sugar and the grated rind of an orange and putting them into a basin with 2 oz. finely chopped suet, the same quantity of bread-crumbs, 1 oz. rice flour, $\frac{1}{2}$ teaspoonful baking-powder, and a good pinch of salt. Into the centre of these ingredients strain the juice of half an orange and a well-beaten egg, mixing all well and adding a little milk if necessary. Turn the mixture into a greased basin or mould, cover it with a piece of greased paper, and steam it for two hours or more. This pudding should be served with orange sauce.

A baked orange pudding can be made by peeling 6 oranges, breaking them into small sections and after removing the seeds, putting them into a pudding dish. Sprinkle over them $\frac{1}{2}$ lb. castor sugar, and leave them to soak therein while preparing the following mixture. Stir together a tablespoonful of cornflour and a little cold milk, and when they are smoothly mixed add them, together with a well-beaten egg, to a pint of milk that has not quite reached boiling point. Stir the whole until it thickens, then pour it over the fruit and on top spread the stiffly beaten whites of two eggs. Bake the pudding until it is firm and lightly browned.

Orange Sauce. This sauce is made by warming the strained juice of half an orange, together with the rind and 2 oz. sugar, in a small pan near the fire. When the sugar has melted, add a teaspoonful of cornflour mixed smoothly with a small teaspoonful of water. Stir the sauce until it boils; then simmer it for a few minutes to cook the cornflour before serving.

Orange Syrup. When orange flavouring is required this syrup may be used with excellent results. To make it, squeeze the juice from 12 oranges, strain it, and then boil it up in a saucepan with $\frac{1}{2}$ lb. lump sugar. When it thickens, skim and bottle it.

Orange Tart. Rub the grated rind of 2 oranges with 2 heaped tablespoonfuls sugar, and then cream these with 2 oz. butter or margarine. Add to them the yolks of 2 eggs, 2 oz. finely crushed biscuit, and the strained juice of the fruit. Then beat the whites of eggs to a stiff froth, stir them in, and pour the mixture into a tart tin lined with puff pastry (see Pastry). Bake the tart in a fairly hot oven until the pastry is lightly browned and the mixture set. Just before serving, sprinkle the surface of the tart with castor sugar.



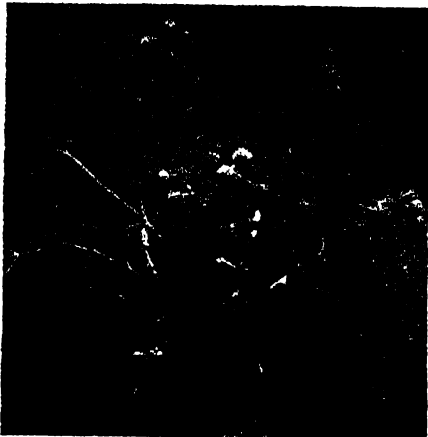
Orange. Leaves and ripe fruit of a variety of orange known as the Otaheite



Orange Baskets, a novel method of serving jelly made from the fruit

ORANGEADE. To make orangeade, pare the rinds of 3 ordinary and 1 Seville orange and put them into a jug; pour on them 1 pint boiling water and let them steep, covered up, for 6 hours. Make a syrup with $\frac{1}{2}$ lb. sugar and $1\frac{1}{2}$ pints water, and add it to the steeped rinds, together with the juice of the oranges from which the rinds have been taken, and the juice of 3 additional oranges. Stir the whole well and when cool strain it through muslin. The juice of a lemon may replace that of one orange.

ORANGE BALL TREE. This is the popular name of a handsome hardy flowering shrub (*Buddleia globosa*). It thrives in



Orange-ball Tree. Evergreen shrub with globular yellow flowers which will brighten a dull garden

ordinary soil, reaches a height of 8-10 ft., and bears round heads of yellow flowers in summer. Any required pruning to keep the bush shapely should be done after flowering. Propagation is by cuttings in a frame in August. *Buddleia variabilis* and its finer varieties *veitchiana* and *magnifica* bear racemes of mauve flowers, which attract the butterflies and bees, in July and August. They must be hard pruned in spring.

ORANGE BITTERS. An excellent recipe for orange bitters is the following: Take 1 oz. Seville orange peel, $\frac{1}{2}$ oz. gentian root, $\frac{1}{2}$ oz. cardamoms. Husk the cardamoms and crush them with the gentian root. Place the whole in a wide-mouthed bottle and cover it with brandy or whisky. Allow the mixture to remain for 12 days, then strain it and bottle it off for use, adding 1 oz. lavender drops.

ORANGE BRANDY. This liqueur is made as follows. Place in a stone jar the rind of an orange cut thin, add a gill of strained orange juice, and a quart of brandy. After three days, add $\frac{1}{2}$ lb. loaf sugar. Stir until the sugar is dissolved, and let the liquid stand for a day. Then strain it, pour it into a bottle, and cork lightly. Orange brandy improves with keeping. See Brandy.

ORANGE LILY. This is the common name of *Lilium croceum*, a hardy lily, which bears brilliant orange-coloured blooms in summer on stems 2-3 ft. high. It thrives in ordinary soil; the bulbs should be planted 3 in. deep in the autumn.

ORANGE LIQUEUR. This drink is made by peeling 2 Seville oranges and 2 small lemons, putting the peel into a jar with $1\frac{1}{2}$ pt. whisky and 7 oz. lump sugar, corking it down tightly and leaving it for 5 or 6 days. Keep it well shaken daily, then strain it through muslin, or a very fine strainer, and bottle it for use. See Liqueur.

ORANGE WINE. In making this wine 8 large Seville oranges should be allowed to each gallon of cold water. Put 4 of these into

the water with the peel on; pare the other four, cut them into halves and then add them to those in the water, saving the peel for other purposes. Leave the whole for 10 days, stirring it two or three times daily; then strain it through a hair sieve and add 4 lb. lump sugar to every gallon of liquor. When the sugar has dissolved the wine may be put into a cask. Bung it loosely for three or four days, then tighten the bung and after six months bottle for use.

ORANGES AND LEMONS. This is one of the old singing games, and is still much in vogue for small children. Two people join hands, making an arch beneath which the others have to pass. As height is important it is better for adults to take this part. The children then form into a chain, each child with his hands on the shoulders of the one in front of him, and pass under the arch formed by the two adults. Meanwhile all sing the following rhyme:

Oranges and lemons, say the bells of St. Clement's;
You owe me five farthings say the bells of St. Martin's.
When will you pay me? say the bells of Old Bailey.
When I grow rich, say the bells of Shoreditch.
When will that be? say the bells of St. Peter's.
I do not know, says the great bell of Bow.
Here comes a candle to light you to bed,
And here comes a chopper to chop off your head.

When the last couplet is reached the two adults drop their hands over one of the chain, imprisoning him. He is then asked whether he prefers oranges or lemons, and having made his choice in a whisper, he is put behind the person representing that fruit, a matter which has been settled by the two before the com-

mencement of the game. When all the players have been captured in this fashion and are ranged behind one or other of the adults, the game ends in a tug-of-war between the two parties, the first couple still holding hands. See Children's Party.

ORCHARD. The best spot for an orchard or fruit garden is one that is sheltered from north and east winds, as far as possible, and has a southern or south-western aspect. Loamy soil is best, but other kinds can be made suitable by cultivation. A gentle slope is better than a dead level ground, on account of drainage.

Young standard trees may be planted in pasture land in which to form an orchard, and in that case they should be put in about 30 ft. apart every way. Such land may be used for sheep, but in the home garden orchard the usual plan is to economise space by planting bush fruits, strawberries, etc., between the large fruits. When an orchard is first planted the young trees should be staked until they are thoroughly established, and the soil round the trees must be kept clear of grass.

The grass should always be kept closely grazed, preferably by turning sheep into it, and must never be allowed to get so long and rank that it has to be cut with a scythe or mower. See Apple; Cherry; Fruit; Pruning; Strawberry, etc.

ORCHARD HOUSE. A heated greenhouse used almost entirely for the culture of fruit is known as an orchard house. It may be either lean-to or span in structure. See Apricot; Grape; Greenhouse; Nectarine; Peach; Pineapple, etc.

ORCHIDS: VARIETIES AND THEIR CULTIVATION

Beautiful Flowers that the Amateur Gardener can Grow

See Colour Plate facing page 781. Also Greenhouse, and notices, a few various orchids, e.g. *Cattleya*, *Miltonia*, etc.

Orchids are rightly regarded as the most fascinating of all flowering plants grown under glass; there are many genera or groups, innumerable species, and an untold number of varieties and hybrids. Orchid growers raise new hybrids or crossbreeds annually, and these now form the bulk of the orchids grown by those who specialise in these flowers.

For the purposes of cultivation orchids are grouped in three classes according to the temperature of the glasshouse suited to their needs. Some must be grown in a hothouse having a minimum winter temperature of 65-70 degrees. Others are suited to what is

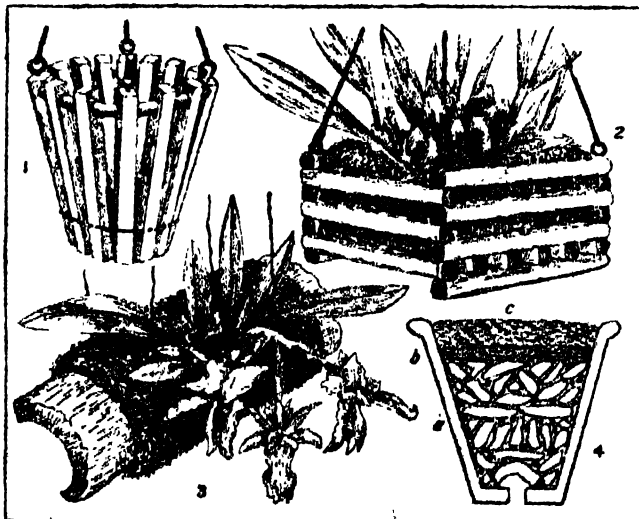
called the intermediate house, with a minimum winter temperature of 60 degrees, and cool house orchids will thrive in a greenhouse in which the temperature does not fall below 45-50 degrees in winter. Orchids suitable for the greenhouse are *odontoglossum*, *Ada aurantiaca*, *odontioda*, *lycaste*, *cypripedium*, and *masdevallia*.

Those which should be grown in the intermediate house are *cymbidium*, *cattleya*, *laelia*, *epidendrum*, *oncidium*, *miltonia*, *sophronitis*, *coelogyne* and *dendrobium*. Orchids which need the conditions of a hothouse are *vanda*, *aerides*, *phalaenopsis* and *calanthe*.

Some of the chief kinds suitable for cultivation by amateurs are dealt with in the following notes. For particulars of species and the countless beautiful hybrids now available the catalogues of orchid growers should be consulted.

Some Examples. A charming orchid suitable for the cool house is the orange scarlet *Ada aurantiaca*. Repotting is necessary when new growths are about 3 in. long, a suitable compost being fibre, oak leaves, and sphagnum moss.

Cattleya is an orchid of exquisite shape and delicate colours, containing species excellent for the warm and intermediate



Epiphytal Orchids. 1. Wood basket for drooping species. 2. Another type of hanging basket. 3. Plant grown upon sphagnum covered bark. 4. How to pot erect-growing kinds: a, crocks and charcoal; b, peat and sphagnum; c, sphagnum moss.

houses. Pot culture is necessary, in a compost of fibre, peat, and sphagnum moss, plants being repotted every 2 years with removal of all decayed or dead roots and bulbs. Each plant should be dealt with as soon as new growth has reached about 3 in., using fresh small pots in scrupulously clean condition.

The free flowering *Coeloglyne cristata* has blossoms of white and a yellow lip. Being very shallow rooting, it is best grown in an orchid pan in the intermediate house. When repanning becomes necessary, an operation not often required, a compost of peat and sphagnum moss should be employed. Large plants are to be encouraged if free flowering is required.

Cymbidium is a magnificent orchid for amateurs, suitable for the intermediate or even the cool house. Plants should be repotted very firmly in a mixture of loam, leaf mould, peat, and sand, damping it well, and placing upon plenty of well-cleansed crocks.

Cypripedium is an extensive genus containing many species and hybrids. It is a bulbous kind, producing leafy growths, and bearing, as a general rule, large, handsome blooms, popularly known as lady's slippers, on stiff, erect spikes. These orchids bloom successfully in turfy peat and a little loam, sweetened with charcoal.

Some of the beautiful genus *Dendrobium* are suitable for amateur cultivation, either in cool or warm house, the following being recommended: *Dalmanii*, *Jamesianum*, which are cool house kinds; noble and *thyrsoflorum*, for warm house cultivation. Suitable compost is turfy peat and sphagnum moss.

Disa grandiflora, commonly called the flower of the gods, bears blossoms of bright scarlet with light markings during October. It requires special cultivation. From spring until autumn the compost must be kept in a state of even sponginess, but without excess of moisture; during winter the plants are best in a light position at the coolest end of the house. From April to September the plants may be placed in shady frames out of doors. A suitable compost consists of equal parts of peat and living sphagnum moss, with a little sand. Pots or pans must be perfectly clean and well drained.

Epidendrum vitellinum majus is the name of an orchid bearing orange-scarlet flowers on



Orchid: three hardy kinds. Left to right: bee orchid, a small orchid for the rock garden; Madeira orchid, a plant needing a damp situation; and *Calypso borealis*, bearing purple, white-lipped flowers

erect spikes, with summer and autumn flowering forms. It may be grown in pots, pans, or baskets, $\frac{1}{2}$ full of clean crocks, topped with a compost of 2 parts fibrous peat, some sphagnum moss, and silver sand $\frac{1}{2}$ of the whole. All dead and decayed roots, leaves, or bulbs should be removed before repotting, and the plants kept on the dry side during winter to prevent splitting of leaves.

The genus *Laelia* contains some beautiful species. Kinds recommended are *anceps*, *autumnalis* and *praestans*. *Laelias* have been crossed with *Cattleyas*, and the hybrids known as *Laelio-cattleyas* are vigorous and free-flowering. A fine example of the many hybrids is known as *St. George*. Flowers are all very widely varied in this section, spikes producing 2, 3, and sometimes 4, and 5 on a spike. No class of orchid is more suitable for a house where a minimum temperature of 50° can be maintained. A winter-flowering orchid that does well in a cool house is *Leucostemone*

There are many varieties, the blossoms being usually pale pink, with mottled crimson lip. They are easily cultivated in pots of loam, peat, and sphagnum moss in equal parts, with a surface layer of the latter. Repotting every second year is beneficial.

Maederallia ignea produces large, bright scarlet blossoms during the summer months. This orchid is suitable for the intermediate house.

Miltonia exhibits great variety of colour, from purest white to a lovely shade of rose. *Vexillaria* will grow in a warm, mixed greenhouse if placed in a light position at its warmest end. It is best cultivated in a pot containing 3 parts of clean crocks, then a compost of fibrous peat, chopped sphagnum moss, and charcoal, with a surface of sphagnum.

The various hybrids of *Odontoglossum* combine the bright red colourings of *Cochlidium* with the varied shades of *Odontoglossum*. They should be grown in a cool greenhouse. A compost of osmunda fibre and fresh sphagnum moss in equal portions is employed, together with a little decayed oak leaves; the whole is made damp and placed in a perfectly clean pot containing 2 parts of clean crocks.

Odontoglossum is an extremely beautiful genus of orchids which contains many genera for the cool house, bearing sprays or branching spikes of blossoms, each varying from 5 to about 40 in number. The colour is infinitely varied, ranging through transparent white, chocolate, violet-purple, claret, yellow, lilac, and chestnut, with spottings and markings in perfect harmony. Two of the most popular species are *crispum* and *grande*, but there are many others.

Abundant air is essential, with nicely diffused sunlight whenever available. When in full growth, and while flowering, water must be copious and free, but after flowering only sufficient moisture should be allowed to prevent the soil becoming dry. Broadly, the plants require a long resting period, covering a couple of months. Suitable compost contains 2 parts fibrous peat and $\frac{1}{2}$ a portion each of sphagnum moss and charcoal, top-dressed with a layer of fresh moss. It is important to note that regular damping-down must be maintained during summer to keep the atmosphere uniformly moist.

The choice greenhouse variety *Oncidium papilio* is illustrated here. *Crispum*, *concolor*,



Orchid: some greenhouse varieties. Top, left to right: *Laelio-cattleya* St. George, *Coeloglyne cristata*, and *Oncidium papilio*. Bottom, *Odontoglossum crispum*, and *Cypripedium Germaine opois*

flexuosum, *Marshallianum*, *tigrinum* and *varicosum* *Rogersii* may be selected. The compost is composed of oak leaves and poly-podium fibre. Flower spikes must be removed directly they begin to fade.

Pests and diseases will not give great trouble amongst orchids if house and plants are kept thoroughly clean. New plants should always be thoroughly inspected for parasites before placing them with general stock, and where insects appear thorough cleansing with insecticide is the rule. The plants may be steeped in warm solution, provided this is done very carefully. Common pests are slugs, green-fly, thrips, mealy bug, wood-lice, cockroaches, and red spider.

Wild Orchids. There are some beautiful flowers among the hardy orchids, some of which grow wild in Britain. They are most likely to flourish if planted in the rock garden in slight shade in a compost of loam, peat, and sand.

The bee orchis (*Ophrys apuleia*), spider orchis (*Ophrys aranifera*), and fly orchis (*Ophrys muscivora*) need chalky, loamy soil. Other beautiful hardy orchids are the Madeira orchid (*Ophrys flosa*), purplish 19-21 in. the Marsh orchid (*Ophrys latifolia*), purplish, 12-15 in., the spotted orchid (*Ophrys maculata*) 8-10 in. with spotted leaves and rose-purple flowers, lady's slipper (*Cypripedium spectabile*) 18 in., white and rose, butterfly orchid (*Isotria medeoloides*), 12 in., white, epipactis (*Epipactis atrorubens*), 12-18 in., greenish-purple, and *Helleborus* *hyacinthoides*, 12 in., purple.

ORCHIS. This is the name of a genus of hardy orchids. Some of them grow wild in Great Britain. A description of the different species will be found in the article on orchid above.

ORGANDIE. The thin, semi-transparent material known as organdie is used for summer dresses, women's collars and cuffs, for glass curtains, and for night wear caps and handkerchief sachets. It can be obtained in colours, and its chief virtue lies in the stiffness which prevents it from creasing so easily as most of the other cotton summer fabrics. To achieve the best effect, coloured organdie, when used for non-transparent articles, needs a foundation of the same shade, while collars of this material need to be backed in position, otherwise their stiffness will not allow them to be neatly over the dress. See *Starch*.

ORIEL : The Window. This term is used to describe a particular form of window, the characteristics of which are that it is overhanging, or projecting, divided into different bays, and located upon an upper floor. It is also used to describe a recess within a room. See *Window*.

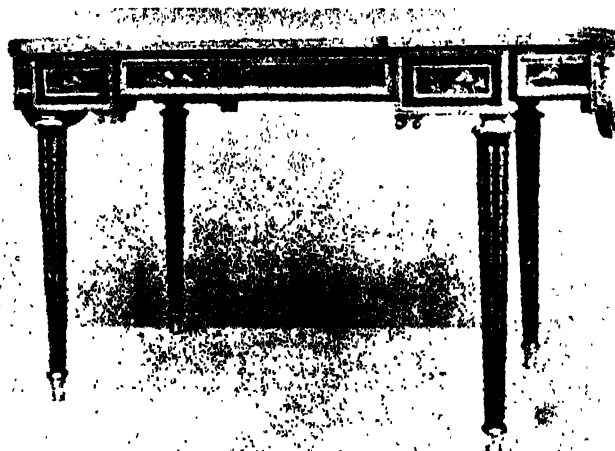
Oriental Poppy. This vigorous hardy perennial (*Papaver orientale*) bears large showy flowers in May and June. See *Poppy*.

ORIGANUM. This is the botanical name of a group of low-growing herbs. The most familiar is the marjoram (*Origanum vulgare*), which is raised from seeds sown out of doors in spring. *Origanum dictamnus*, called pink hops and dittany, is a pretty little pot plant with bunches of pink hop-like flowers; it can be increased by cuttings of the young shoots. See *Marjoram*.

ORLOFF : The Fowl. This breed of Russian fowl possesses what is known as a raspberry comb with small feathers growing between the little rounded nodules. This distinguishes it above all other breeds in Great Britain. The Orloff is bred in five colours, mahogany, spangled, black, white, and blue. It is a muffed breed and also bearded, but it is a good laying breed and a non-sitter. Eggs average 7 or 8 to the lb. Adult cocks weigh 8 lb. to 10 lb., and hens 6 lb. to 8 lb. They do well either kept semi-intensively or on free range.

The mahogany variety are the most handsome; next to them come the spangles. The mahogany chicks are like Rhode Island red chicks. The spangles vary, being either buff or buff with a brown stripe down the back, and sometimes almost white. Chicks of the other varieties follow their colour. See *Chicken : Fowl ; Poultry*.

ORMOLU. From the time of Louis XIV to the First Empire, French cabinet makers employed for the enrichment of their productions bronze mountings, which were cast, chased, and gilded. Similar metalwork was used for the mounting of porcelain and glass.



Ormolu. Oblong table with rounded ends, three drawers and fluted legs mounted with chased ormolu. French : period of Louis XVI.

By permission of the Director, Victoria & Albert Museum, Kensington.

vases, and for the fabrication of clock cases, wall brackets, mirror frames, and the like.

The castings at their best were exquisitely chased, and finished with a mixture of gold and mercury, sometimes tinted, such as the greenish ormolu of Gouthière and other masters. Similar mountings were used by some English makers, but very sparingly; Adam is said to have employed French and Italian artists for the purpose. The plain brasswork, gilded or ungilded, to be seen on the door fittings of 18th-century English furniture is not ormolu, which is essentially chased and gilded bronze.

The metal mounts used on modern reproductions of old furniture, although often styled ormolu, are usually finished by more or less superficial methods of electro-gilding, by cheap spirit lacquer, or by the water-gilding employed by French makers for current styles of ormolu clocks and the like. Copies made by the galvanic battery can be detected by the granulated surface on the back. The modern alloys contain much zinc, with a thin gold or lacquer wash, and readily lose their brilliance, especially when exposed to gas fumes. The imitation mounts may be made to appear old by chemical means. Good reproductions exist, but are costly to make.

Collectors seldom meet with old mountings in a detached form, because anything of the kind worth having can generally be turned to better advantage on faked furniture. Sometimes the metal handles of broken vases, lion masks, inkstands, and other ornamental

pieces may be acquired as examples of French chiselling. They should be examined with caution, and accepted only if they possess some artistic merit of their own. Old ormolu should never be cleaned with metal pastes nor touched up with gold varnish, but should be treated carefully with dry leathers. See *Directoire Style ; Louis Style ; Marquetry*.

ORNAMENTAL GRASS. Many beautiful annual grasses are suitable for association with cut flowers in summer or for winter decoration, and for growing in pots. Seeds are sown out of doors in March-April where the plants are to bloom. The right time to gather these grasses is just before the blooms are fully open. After cutting they should be exposed to the sun until thoroughly dry.

The following are particularly recommended, hare's tail, love grass, Job's tears, animated oat, quaking grass, squirrel tail, feather, cloud, golden spike, and three-horned grass. See *Flower Garden ; Garden ; Grass*.

ORNITHOGALUM. This group of hardy and greenhouse bulbs contains several valuable garden flowers. The commonest is the Star of Bethlehem (*Ornithogalum umbellatum*), which bears star-like greenish-white flowers in spring and will thrive in shady places out of doors. Other hardy kinds are pyramidal and umbellum, both with white flowers, and others greenish-grey. They grow from 12-18 inches high. The bulbs should be planted in September and October. *Arabidrum* and *Lactuca* are often grown in pots in the cool greenhouse.

ORPINGTON DUCK. Although smaller than the Aylesbury, the buff Orpington duck is hardly inferior to it as a table bird, and is a prolific layer. Its general characteristics are a good carriage and an aspect of alertness. The ducks attain a weight of from 7 lb. to 9 lb., and the ducks from 6 lb. to 8 lb. There is an offshoot from this breed known as the Blue Orpington, which lays large eggs and is a good table bird. Blue Orpingtons are of active habit and mate without the aid of pond or stream. See *Duck*.

ORPINGTON FOWL. This breed has a reputation as a layer of fair-sized tinted eggs and as a table bird. There are varieties in several colours, the buff being the most largely kept. They are very hardy and do well under any conditions, and as sitters and mothers they are unequalled. When fully matured the male birds should weigh between 9 lb. and 10 lb., and the hens between 7 lb. and 8 lb. No other fowl presents such a perfect combination of excellent laying and table qualities. See *Fowl ; Poultry*.



Ornithogalum, a breed of low unequalled for its all-round qualities.

ORRIS ROOT. The root of the iris, the blue flag of suburban gardens, is largely used in various toilet preparations under the name of orris root. Roots of the following irises lend themselves to treatment: *Iris Germanica*, *I. Florentina*, and *I. pallida*.

Because its scent resembles that of the violet, orris root is employed in the making of violet powder, and a perfume known as essence of violets is distilled from it. See *Flag ; Iris ; Scent*.

ORTHOCHROMATIC PLATE. In photography partially correct rendering of colours is obtained by the use of special plates

or films with or without light filters. Such plates or films are said to be orthochromatic or isochromatic. They are made more sensitive to greens and yellows than ordinary plates by being specially sensitized with eosin or erythrosin dyes, and are intended to be used with yellow light filters. In some cases a yellow dye is included in the emulsion on the plate, no separate light filter then being required.

All these plates give better renderings of greens and yellows in landscape and other objects containing colour. The undue influence of blue and ultra-violet rays seen in ordinary plates is reduced by the yellow filter or dye without serious increase in exposure. They are still, however, not sufficiently sensitive to reds and even yellows; for truly orthochromatic results panchromatic plates and films must be used. In practice the usefulness of orthochromatic plates lies in the fact that improved renderings of colours are obtained with little increase in exposure, and that the red light can still be used in the dark room if care is taken to see that the plate is exposed to it as little as possible during development. In some plate in which the filter is included as a yellow dye in the emulsion the speed of the plate is slightly increased.

Orthochromatic roll films, as well as self-screened plates, can be used without a filter, but even with these slightly better results can be obtained if a filter is used. Both with these and with the plates designed for use with filters only a pale screen, such as the Kodak K1 or the Ilford A (alpha), which increases exposure by two, should be used. Deeper filters not only increase the exposure, but tend to overcorrect and give unnatural results. In artificial light and at sunset, when there is a good deal of yellow in the light, all these plates can be used without a filter. See Light Filter; Panchromatic.

ORTOLAN. The small birds known as ortolans are about the size of larks and are in season in September. They are rare in England being mostly imported from Belgium, but are considered a delicacy. Ortolans are usually dressed with savoury forcemeats and laid in cases or on croûtes of fried bread.

Cooking the Bird. To cook them make a rich liver stuffing. Using 1 fowl's liver or a corresponding portion of calf's liver to each bird. Fry the liver with 2 or 3 rashers of fat bacon cut in dice, adding 1 tablespoonful dried sweet herbs which have been passed through a fine sieve, a little grated nutmeg, and seasoning of pepper and sauce. Pound the liver and press it through a sieve, then mix with it 2 tablespoonfuls panada or fine breadcrumb and the yolks of two eggs enough for 4 fowls' livers.

Take 6 rounds of bread about $\frac{1}{2}$ in. thick and rather larger than the ortolan, make an incision all round the edge, leaving a narrow border, then fry these croûtes to a light brown. Take them up and scoop out a hollow in the centre, which should be lined with a portion of the farce; place in each an ortolan, and spread over a little butter or margarine. Bake in the oven about 15 min. When ready, glaze them, and dish, pouring over and around some rich brown sauce to which has been added (if desired) a glass of madeira.

These birds are sometimes fried in a small amount of salad oil with a little chopped shallot, a few chopped mushrooms, chopped truffle, chopped parsley, and a little grated nutmeg. Cook for 10 min., then add a lump of glaze, 2 or 3 tablespoonfuls brown sauce, and the juice of half a lemon. Divide the birds in cases or on croûtes, pour over them the contents of the saucepan, and place them in the oven for 10 min. to brown. Then dish, and serve them with rich brown gravy.

OSCILLATIONS. These are high-frequency alternating currents which flow round a circuit, containing inductance and capacitance, when the circuit is supplied with energy from some external source, such as a broadcast transmitter or other generator of high frequency currents.

A radio receiver can itself produce oscillations, through the misuse of reaction. These oscillations, if permitted to flow back into the aerial circuit, may heterodyne the carrier wave of a broadcasting station and thus cause interference to nearby receivers. A condition governing

the issue of a receiving licence is that reaction must not be used in this way. When a set is oscillating the received broadcast will be distorted, and if the tuning control is varied squeals will be heard in the loud speaker or telephones. The reaction control knob should be immediately readjusted. The oscillating state may be purposely produced for some specific reason, as in superheterodyne receivers, etc. But it may occur where not required, as in "straight" receivers, through bad design or maladjustment. See Alternating Current; Heterodyne; High Frequency.

OSIERS FOR BASKET MAKING

Apparatus and Weaving Methods Fully Explained

This article may be described as a continuation of the one under the heading of Basket Making. Entries on other related handicrafts will be found throughout the work, examples being Cane, Rattan, Rush Work, Wicker Work. See also Linen Basket.

In Great Britain there are about 40 varieties of the osier used by the basket-maker. They are grown in the low-lying land of the river valleys. When cut the osiers are known as rods and are sold as either green, brown, buff, or white. The freshly-cut green are partially dried in stock in the field and are afterwards stacked in a shed or in the open and thatched until quite dry, losing 50 per cent. in weight. Fully matured brown rods are used for

paring a path for the insertion of rods, a maul (Fig. 6) for a hammer, a commander (Fig. 7) for straightening stout rods. Shears for cutting (Fig. 8) are required, and 3 or 4 way cleaves (Fig. 9) for splitting. A shave (Fig. 10) is employed for trimming the split rods to form skein, the latter being similar in appearance to chair cane, and used for finishing handles, etc. The worker also needs a cad weight to keep the work on the lapboard, a yard measure,



Fig. 1. Parts of Osier

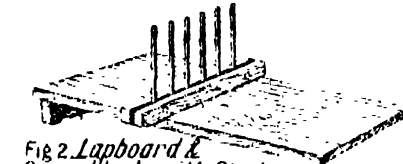


Fig. 2. Lapboard & Screwblock with Sticks in position

Osier, Fig. 1. Typical rod for basket work.
Fig. 2. Board for holding work and block which secures upright stakes.

coarse basketry in making all kinds of hampers and fruit baskets. Buff rods are prepared by removing the bark from either green or brown rods after they have been boiled in water from 2 to 5 hours, they are then dried in the sun to intensify the colour.

White rods are prepared by removing the bark from green rods, either directly after cutting or after they have been kept during the summer stacked with the bottoms in running water. Peeling is effected by splitting the bark by pulling the rods between a pair of upright iron rods, termed a break, and then removing the bark by hand.

A rod has 4 parts, as shown in Fig. 1: the butt A, the top B, the belly C, and the back D. All rods are sorted into lengths; the short lengths of brown are called luke, the medium lengths long small, threepenny, and middle-bore, and the long are great or rods. Buff and white rods in the small lengths are termed tack and small. Brown rods must be soaked from 2 to 7 days according to size before they can be used, buff and white rods from half to 4 hours, and allowed to mellow for several hours. The uprights or "sticks" used for bottoms are cut from osiers of 2 or 3 years' growth for large baskets. The radials in a round bottom or cover are also termed sticks.

Tools Required. The tools and apparatus used in working osiers comprise a lapboard and a screwblock (Fig. 2); the former for holding the work in progress and the latter for securing the upright stakes in square work. A shop knife (Fig. 3) is used for cutting the rods; a picking knife (Fig. 4) for trimming the short ends and bending; bodkins (Fig. 5) for pre-

paring a path for the insertion of rods, a maul (Fig. 6) for a hammer, a commander (Fig. 7) for straightening stout rods. Shears for cutting (Fig. 8) are required, and 3 or 4 way cleaves (Fig. 9) for splitting. A shave (Fig. 10) is employed for trimming the split rods to form skein, the latter being similar in appearance to chair cane, and used for finishing handles, etc. The worker also needs a cad weight to keep the work on the lapboard, a yard measure,

a piece of sponge,

and a grease horn for use with the bodkin.

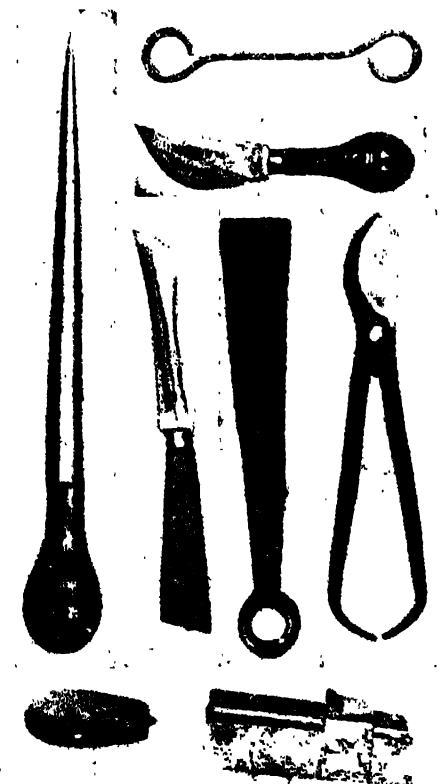
Methods of Weaving. Single weaving

(Fig. 11) between

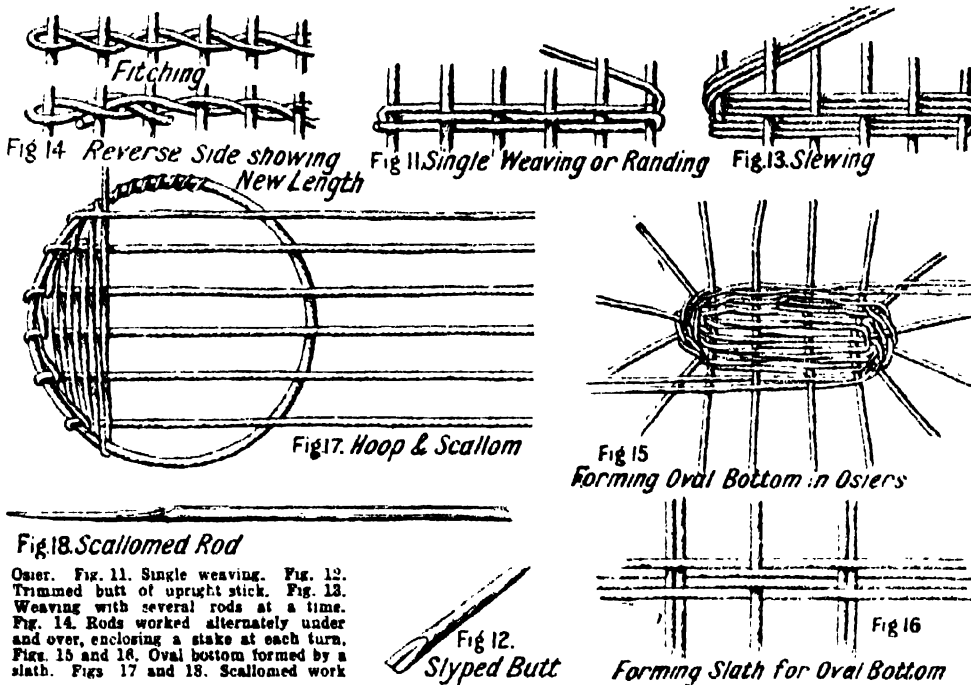
stakes is done in

square work by slapping

(Fig. 12) or trimming the butts of upright sticks, and securing them in the screwblock. The rod is slightly bent as it is carried round each stick, and when the end uprights are negotiated, the rod is gradually



Tools used in working osiers. Figs. 3 and 4. Knives for cutting and trimming. Fig. 5. Bodkins. Fig. 6. Maul. Fig. 7. Commander. Fig. 8. Shears for cutting. Fig. 9. Cleave for splitting. Fig. 10. Shave for trimming split rods to form skein.



Scallomed Work. This method (Fig. 17) is used in making a frame for a bottom or cover and also for staking some forms of basket. It consists of making a long cut at the butt end of a rod (Fig. 18) so that the rod may be turned round the frame and held in place by the next stake. It is useful in making light round and oval baskets and all kinds of covers where lightness and strength are required. The frame to which the scallom rod is attached is called a hoop. Any kind of shape can be made. Scallomed stakes are commonly used in the light and cheap hampers made with slewed weaving. This is because they can be made in much less time.

Preparing Skein. Skein formed by the trimming of split osiers is used in covering handles and for filling up the sides of small baskets used for holding letters and for picnic, lunch, and linen baskets. The method of preparation is to take a long, straight, dry white rod and cut a few inches off the top. Suitable cuts are made at the top, either 2 or 3 according

brought upright, passed round the stick and worked down on top of the others. Slewling, as it is usually called (Fig. 13) is a quick method of weaving, several rods being worked at the same time. It is employed for rough work, but is not so neat or strong as single or randed weaving. If, however, the rods are the same size, the weaving can be kept level. Bye-stakes are used mainly in round work, and consist of supplementary stakes inserted between the original stakes and held in place by the first rows of weaving, called the upsett.

Fitching (Fig. 14) is a method of working two rods alternately under and over each other, so as to hold a stake or bye-stake at each turn. It is useful for open work when it is not necessary to fill up the sides of a basket with weaving. It may be commenced with either the tops or butts, and in practice the rods are worked one after the other in the order shown. Cross fitching is done with double stakes in cases where the stakes are crossed, a common method of dealing with open-sided baskets. The foot of a basket is formed by driving short

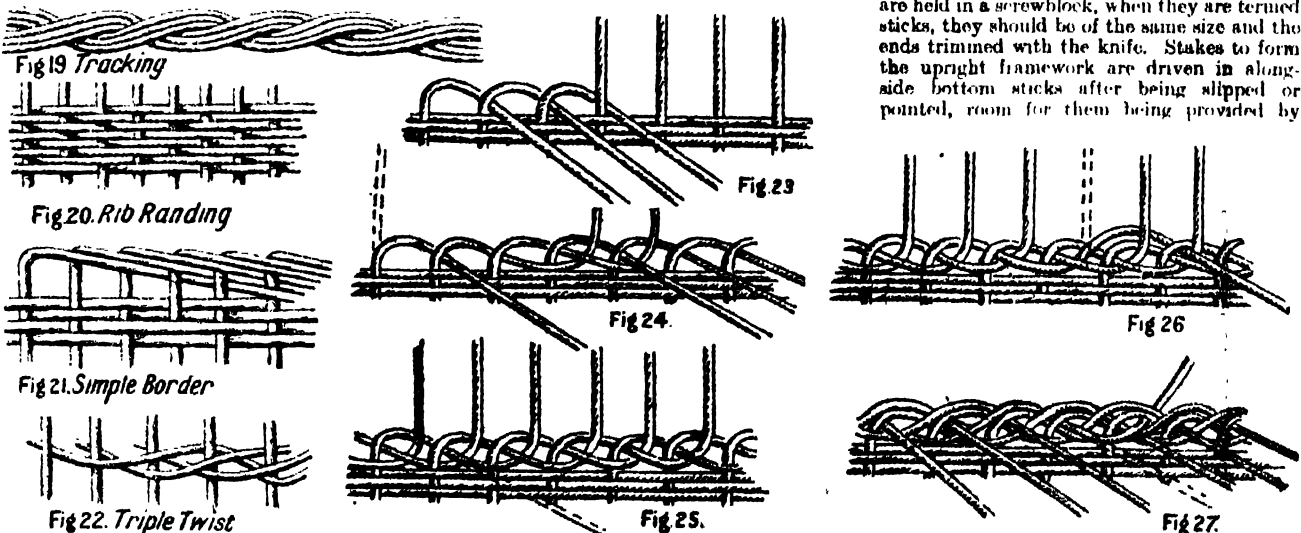
stakes in the sides when the work is upside-down: the rods are laid down and worked in the same way as a border. Oval bottoms (Fig. 15) are formed by a slath (Fig. 16), and the sticks or radials separated by working a pair of rods together.

A pair of rods worked alternately over and under each other, the reverse of a fitch, is called a pair. This method is used in forming round bottoms and also in adding a second round of weaving on top of a fitch.

Picking is the operation of cutting off the projecting ends of rods which are left after the weaving is completed. The edge of the knife must be very sharp, and care must be taken at first to avoid cutting the woven rods. Sufficient material should be left to prevent the end working out past the stake. Picking up the stakes to bring them to an upright position ready for weaving the upright sides is effected by the point of the shop knife. This operation prevents the bark or skin from breaking, but this is effective only if the rod has been properly soaked and allowed to become mellow.

to the cleave used, and then it is pushed down towards the butt, the rod being guided with the hand in order to ensure a uniform cleavage. The split length is placed pith side uppermost on the shave. The distance between the plate and the knife edge should be carefully adjusted to take off the pith first. The length is again passed under the knife, set a little closer to the face, and a further shaving taken off, this operation being repeated until a finely shaved and even skein is produced. It is necessary to keep the rod close to the face of the shave, and it is usual to use a leather thumb stall. The upright shave is used when even finer skems are required. The skems are used after dipping in water; they do not require soaking, the process being called lapping when they are wrapped round a handle.

Stakes. Stakes to form the framework of a basket are generally chosen from the stouter lengths of osier. They should be straight and smooth, the hand being used to press the successive rows of weaving down on one another. In square work where the stakes are held in a screwblock, when they are termed sticks, they should be of the same size and the ends trimmed with the knife. Stakes to form the upright framework are driven in alongside bottom sticks after being slipped or pointed, room for them being provided by



Color. Fig. 19. Alternative to plaiting. Fig. 20. Effective close weaving. Fig. 21. Method of working a border. Fig. 22. Strengthening stakes for a border. Figs. 23-27. Progressive stages in the making of an upright plait. Details are given in the text.

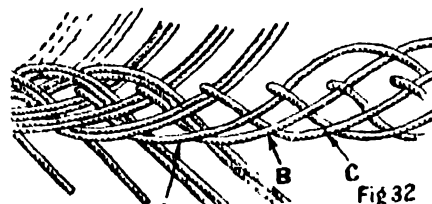
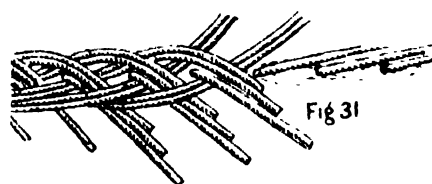
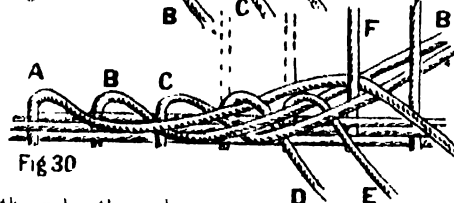
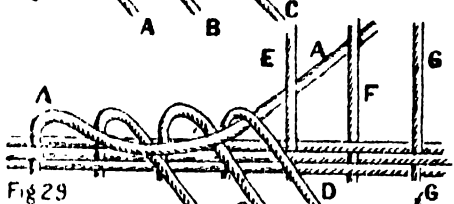
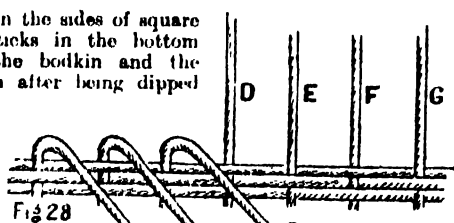
means of the bodkin. In the sides of square bottoms the outside sticks in the bottom must be pierced by the bodkin and the pointed stake driven in after being dipped in water.

In driving a stake home, it should be grasped firmly in the left hand a few inches above where it enters the weaving, and the right hand should be slid down the rod on to the left. A fair amount of force should be used, especially when the stake is nearly far enough in. An odd number of stakes is necessary in squared work, but is not required in rounded work. After the stakes have been pricked up, the tops should be gathered together and held within a hoop. In siding up or weaving, the stakes must be kept upright and parallel with each other when working straight sides, and when doing work where the sides are splayed outward or worked inward the spacing should be quite even. It is important that the rods used in siding up should be worked to the stakes by pressure of the left thumb. As it is essential to the appearance of the resulting work that the stakes should be even, the latter should be held in the right hand while the left hand shapes the weaving. Herein lies the whole art of basketwork.

Tracking. This is a method of finishing covers, and is an alternative to a plait. The method is as follows (Fig. 19). Place the first rod behind the second and leave it in front of the third. The second should be placed behind the third and left in front of the fourth. Place an extra rod in front of the first, place the two in front of the third, behind the fourth, and leave in front of the fifth. Next place the third alongside these two, add a second rod in front of the second, and place them both in front of the fourth, behind the fifth and in front of the sixth, with the fourth alongside. Continue with the first two of the three (the remaining one, the first commenced with having done its work), place in front of the fifth, behind the sixth and in front of the seventh. To continue, place the fifth alongside, dropping the outside of the three at each stroke, and when the round is complete work each one of the rods through to its proper place.

Upsett is the commencement of the weaving in all except the coarsest work and comprises two, three, or more rods worked alternately on the upright stakes to secure them firmly in position. *Wale* is the name given to the stroke used in upsetting and other parts of weaving, and formed by working two or more rods alternately, one by one, in front of two or more stakes, and then behind one. Weaving is effected in osiers by coarse randing for heavy work with stakes $2\frac{1}{2}$ in. apart, slight randing with stakes 2 in. apart, light randing with stakes $1\frac{1}{2}$ in. apart, and fine or close randing with stakes about 1 in. to $1\frac{1}{4}$ in. apart, the work being driven in close with the iron. Rib-randing (Fig. 20) is an effective method of siding up, and consists of working each rod alternately in front of two and behind one for two strokes before being worked out in simple randing.

Borders. Simple borders are worked as at Fig. 21, but the stakes may be strengthened beforehand by working the triple twist shown at Fig. 22. This form of stroke may take the



Osier. Figs. 28-32. Stages in weaving a flat plait, used for arms and backs of chairs, etc.

turn and placed under the next on the right and made to stand vertically alongside the second stake, the last one being threaded through, as at Fig. 25. Each stake is now threaded to the front, behind the stake next but one to it, as at Fig. 26, and then each stake in turn is crossed over, the two stakes lying together and passed to the inside, as at Fig. 27. Any surplus ends left on the inside of the basket should be cut off.

The Flat Plait. This plait, used for finishing trays, arms and backs of chairs and other pieces of basketwork is more difficult to make than the upright form, but if it is followed out with actual material, the following instructions, with the accompanying illustrations, will simplify the work. On the surface the finished plait appears continuous.

Commence by turning down three stakes as shown at A, B, and C at Fig. 28. The stake at A is curved round to the right, passed over B and C and placed in front of D, which is now turned down over it and the end left in front as shown at Fig. 29. The stake at B is now picked up and carried in front of the next two and the first upright of those standing is turned over on it as at E. The same method is followed with C, but, before the upright at F is brought down over it, the stake A, which was left on the inside, is brought across C, and then F, as shown at Fig. 30, is brought down beside it and the two are treated as one stake. At this stage of the work there are three rods outside, one

place of fitting where extra fullness is desired. Another method of forming a finishing border is the plait, of which there are two forms, upright and flat. The upright plait is made by bending down each upright stake, or spoke, in turn, and placing each one behind the next one on the right as shown at Fig. 23. When the last stake is reached it will have to be threaded under the first one that has been turned down, as at Fig. 24. Each stake is now taken in

being a double stake, and two rods inside. The first of the three is taken round the first upright stake to the inside, crossed with the first of the two to the outside and then the upright stake is drawn down. This method is continued, remembering to draw down the upright stake at every cross of the osier. When the double rods are reached they should be treated as one, both inside and outside. When the triple rods are reached, the two longer or outside ones are used, the shortest one being dropped and cut off at the finish. When the last upright stake has been turned down, there will be three triple rods outside and two double rods inside the basket. The method as far as this is illustrated at Fig. 31.

The first two long rods on the outside should be passed under the first stake A, which was turned down, leaving the short one as usual to be cut off at the finish. The next two long rods are passed over the first stake A, and under B, the second that was turned down. The remaining two long rods are passed over the first two, A and B, and carried under the third, C; this gives five double rods on the inside of the basket. Each two in turn should now be threaded to the outside under each single stake, as shown at Fig. 32, until all the five pairs are threaded to the outside. There are now five double rods on the outside, and the longer of the two is threaded from the underside, through the first single stake. Follow to the inside of the basket, and out again to make it double, like the rest of the plait. A bodkin will be needed to lift the stakes in order to make room for the last five single rods.

OSMANTHUS. This is the name of a hardy evergreen shrub. The most useful variety is the Japanese *Osmanthus aquifolium*, which has holly like leaves, small white fragrant flowers in winter, and grows 4-5 ft. high. Peat and loam should be added to the soil before planting. Propagation is by cuttings in a frame in August.

OSPREY. Osprey, egret, and egret are terms used to denote the decorative tufted head plumes of the egret, or smaller white heron. Osprey is the trade name for the egret, but the real osprey is a bird of another species known also as the fishing hawk. See Egrette.

OSTRICH FERN. This is the popular name of *Onoclea sensibilis*, a handsome North American hardy fern, 18-24 in. high. It flourishes in deep, moist soil in a shady place. Like the Royal fern it bears spores on special fronds, not, as in most ferns, on the backs of the ordinary fronds. *Onoclea* (struthiopteris) germanica is another striking species. See Royal Fern.

OSWEGO TEA. This is another name for bergamot, botanically *Monarda didyma*, which bears various other popular names, including bee balm and horsemint. It is a hardy perennial, with sage-scented leaves and bright scarlet flowers in summer. See Bergamot.

OTTO CYCLE. This is the cycle of operations by which many types of internal combustion engines function. The cycle is made up of four strokes: induction, the fresh gases are drawn into the cylinder; compression, the gases are compressed; explosion, the gases are fired (power stroke); and exhaust, the exploded gases are expelled. See Internal Combustion Engine.

OTTOMAN. A stuffed seat without a back, the ottoman is not often seen except in the form of a floor pouffe or box ottoman, its place having been taken by the divan. The Victorian types of ottoman are sometimes divided in the centre with a long padded roll about 12 in. in diameter; others have a centre rail, with a padded top. See Box Ottoman; Divan; Pouffe; Victorian Style.

OTTO OF ROSES. Known also as attar or ottar of roses, this perfume is obtained from an oil distilled from rose petals, damask and musk roses being the kinds generally used. Because of the large quantities of petals needed in its manufacture, otto of roses is comparatively costly. What remains after distillation is made into rose water. See Rose Water; Scent.

OUNCE. This measure of weight is in constant use when buying meat, groceries, etc.: 16 oz. to the pound avoirdupois and 12 oz. to the pound troy. The ounce avoirdupois contains 437½ grains and the troy 480.

In the ordinary way the ounce is divided into 16 drams, but apothecaries divide it into 8. They use it for measuring medicines, when one tablespoonful is equal to ½ fluid ounce, as the apothecaries call it. A dessert-spoonful equals ½ fluid ounce, and a teaspoonful ¼ fluid ounce. The usual abbreviation for ounce is oz., which is used throughout this work. See Avoirdupois; Troy.

OUTHOUSE. An outhouse is a small shed or building, remote from the dwelling. Most householders at some time or other feel the need for a small outhouse, for storing garden tools, minor crops such as apples, potatoes, and the like. Some small buildings are obtainable commercially in the form of sections ready built up, so that the householder can erect them by simply bolting the sections together.

Examples of this class are available in timber, others clothed with asbestos cement sheets, and in a number of combinations of both methods, varieties being covered with galvanized iron and roofed with the same material, with tarred felt, bituminous sheeting, or other proprietary material.

By-laws. An important point before ordering or arranging for the building of an outhouse is to ascertain the requirements of the building by-laws, as there are sometimes certain restrictions to be observed and certain formalities to be gone through, these varying considerably with the particular district.

It is well to bear in mind that to be a tenant's fixture it is generally understood that the building is of a portable nature, resting upon the ground or upon some brick or cement footings, and not a permanent building. See Fixtures; Shed; Workshop.

OVEN. An oven can be heated by gas, oil, or electricity, or it can form part of a kitchen range burning solid fuel. Details of the various types of oven are given in the articles Cooker, and Range. The function of an oven is to retain the heat inside it, and as the chief source of heat-loss is by way of the door, the ideal oven should have a lagged door. That is, the door is made up of two separate plates, the space between the plates being filled with a heat-insulating material to prevent the heat from the hot-plate on the inside of the door from penetrating through to the cold-plate on the outside of the door. It is an advantage to have a panel of transparent heat-resisting material let into the door, so that the cook can see what is going on inside the oven without having to open the door and so let out some of the heat.

When installing any type of oven a site should be chosen away from doors and windows which are likely to create draughts. Ovens should be thoroughly cleaned after each use, and particular attention should be given to the removal of grease. A dirty oven will taint any food cooked in it.

OVERCASTING. This is the name applied to a stitch that is largely used in dressmaking for finishing the raw edges of seams, to prevent the threads from raveling or fraying. As a rule, the stitch is worked along each edge of the seam separately, though in some cases it is worked over the two edges

at once, but here it should be noted that for the latter method the seam must be well pressed beforehand, as no thorough pressing can be done after the stitch is taken over both edges. The stitch should be worked with cotton or silk, according to the nature of the fabric.

To work it, secure the end of the cotton in the material at the left-hand end of the seam with one or two back-stitches, and push the needle through the material towards you, a few threads below the edge; draw through, and again push through from back to front a little further along towards the right. Repeat until the seam is done, and lightly press to take out any puckered effect. Do not draw the cotton tightly when making the stitches, or a puckered effect is bound to ensue, and to get a neat effect make the stitches all of the same size and to slant at the same angle.

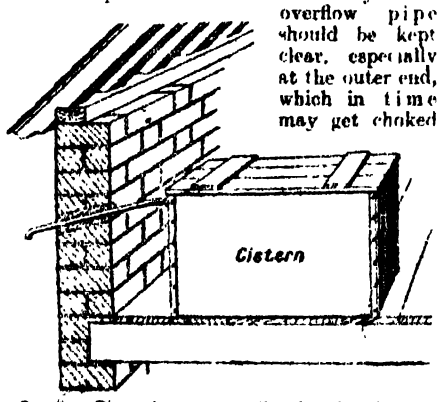
When oversewing a curved seam, in order to prevent any dragging, first snip the seam edges at intervals with the scissors, and round off the corners caused by the snipping. See Seam.

OVERDRAFT. This is a banker's term for a loan made to a customer on a current account. When by chance or design a customer has drawn out from the bank more than he has put therein, an overdraft results. Overdrafts can be obtained by customers from their banks, provided the security offered is regarded as adequate. See Banking.

OVERFLOW PIPE. Any pipe that is connected to the water system for the purpose of discharging an abnormal rise in the height of the normal water level is an overflow pipe. Generally, in the home, such a pipe is connected to the hot or cold water tanks to avoid the flooding of the premises. In the case of the ordinary cold water tank or cistern, such an overflow pipe should be as large in diameter as the supply pipe. It should have a regular gentle fall from the point where it leaves the cistern to the point of discharge, which should be over a gutter or in some place where the water can get away without running or splashing on to the building.

It is advisable that the overflow pipe be visible, so that should the water be wasting, its loss will speedily be made apparent, and the cause can be remedied. Generally, an overflow will be due to the failure of the ball valve. In a hot-water tank, the overflow pipe is generally arranged in such a manner that it acts as an expansion pipe. It relieves the tank of all pressure due to the generation of steam or the expansion of the water, and acts as an overflow should the cistern flood.

Such an overflow pipe is usually set in a vertical position and terminates in an elbow or bend at water level. This is because the water as it heats will rise, and a certain amount of such expansion is not detrimental to the system; it is only when the expansion is above the level of the water supply that it should be possible for it to drain away. The



Overflow Pipe, showing how the pipe should slope gradually from the cistern to the outlet

up with leaves. It should be regularly examined and any obstructions removed.

Overflow pipes generally take the form of a short pipe passing through the wall and merely projecting into the air. This arrangement is usually satisfactory, as it is seldom, if ever, that the water overflows through it. They are provided as a safety device. The materials for such pipes may be lead, wrought iron, galvanized iron or galvanised steel, brass, or copper. Of these, lead and galvanised iron or steel are the most durable. See Plumbing; Tap; Water Supply.

OVERMANTEL. This, as the name suggests, is a fixture over the mantelpiece. Such fixtures are made chiefly of wood, which may be oak, walnut, mahogany, or enamelled or painted deal. They are made in a great variety of styles, with inset mirrors which may be square, round or oval. Unless the overmantel forms an integral part of the chimney piece, it is often the better plan to remove it and to use a panel of embroidery, a flower or landscape painting, a mirror or merely a good ornament on the mantelshelf, according to the type of fireplace and style of the room. See Chimney Piece; Dining Room; Drawing Room; Fireplace; Mirror.

OVOLO PLANE. This is a specially shaped plane, used for working an ovolo moulding on wood. The usual form is made in beech or steel, and the sole is shaped to a reverse of the shape of the moulding which



Ovolo Plane. A common type of the tool in use. The plane will produce. The plane iron is similar to other plane irons, but is shaped on the cutting edge to correspond with that of the ovolo moulding. In use, the plane is traversed along the wood in the same way as a jack plane, but it should be guided on the wood either by a fence or temporary strip tacked to it or by careful manipulation of the plane, especially when commencing operations. If this is not done the shape of the moulding will vary in respect to the edge of the work.

In sharpening such a plane iron, it will be necessary to use an oilstone slip of a shape and size to suit the curvature of the plane iron, using the oilstone slip as though it were a file, to work up a keen cutting edge. The general care is similar to that of other planes.

OXALIC ACID: Poisoning By. Because of its resemblance to Epsom salts, oxalic acid, which is popularly known as salts of sorrel, or lemon, and acid of sugar, may be taken accidentally. When strong oxalic acid is swallowed violent inflammation of the stomach and intestines immediately follows. Following on an intensely sour taste, a burning pain is felt in the throat and stomach; vomiting occurs, and often the vomit contains blood. Collapse soon ensues from the severe pain and this may pass into stupor, and death may speedily take place.

Treatment must be very prompt to give any chance of life. While awaiting the doctor, if vomiting has not occurred, give an emetic of a tablespoonful of mustard in a pint of tepid water, but only if dilute acid has been taken. As an antidote, give chalk, or 2 tablespoonfuls of magnesia mixed with water. Bicarbonate of soda or potash, or ammonia, should not be given, as these form soluble

compounds with the poison. Put the patient on a couch, cover him warmly and surround his body with 5 or 6 hot-water bottles.

OXALIS. Of these low-growing plants, some of them are hardy, while others are suitable only for cultivation in the green house. Of the former a charming kind is the wood sorrel (*Oxalis acetosella*), which grows wild in Britain and is suitable for shady places in the rock garden; it bears white flowers in spring, and is sometimes sold as shamrock. The two best hardy kinds for the rock garden are *adenophylla* pink, and *enneaphylla*, white; they like partial shade and a compost of peat and sandy loam. A familiar plant in many gardens is the bronze-leaved yellow flowered (*Oxalis corniculata rubra*), which spreads rapidly and soon becomes a weed. The rose coloured *floribunda* is a beautiful plant to grow in pots under glass.

OX CHEEK: How to Cook. Ox cheek makes a substantial and appetizing dish if baked or if it can be made into a very good soup or stew. The cheek should come ready cleaned from the butcher, but requires soaking and well washing before any attempt is made to cook it.

After it is thoroughly clean, place it in a large saucepan and cover it with warm water, add a teaspoonful of salt, and boil it up. As the scum rises take it off, and, when clear, let it simmer for an hour. Lift it out of the pan let it cool a little and then bone it carefully. This must be accomplished with a sharp cook's knife to avoid ragged appearance.

While the cheek is boiling a good stuffing must be made. Spread it in the boned ox cheek, roll it up and tie or skewer it securely in an oblong shape. Bake in a moderate oven for 1½ hours, basting frequently, and serve with a good, thick brown gravy.

To make soup, prepare ox cheek as for baking, and place it in a pan with enough cold water to cover it well, and ½ oz. salt. When it boils, skim it and add 2 onions, 2 carrots, 1 turnip, and ½ head of celery. All vegetables must be prepared and cut up. Add a bouquet garni. Let the cheek simmer 2½ hours, then lift it out and remove the meat from the bones. Strain the stock, clear it of fat, and thicken it with brown roux. Cut the meat into squares, boil it up in the soup, and pour into the tureen. The bones will make a good addition to the stock-pot. See Beef.

OX-EYE DAISY. This is the common name of *Chrysanthemum leucanthemum*, a familiar wild flower of Britain. May Queen is a splendid variety for the garden. The Shasta daisy or hardy marguerite (*Chrysanthemum maximum*) is a vigorous hardy border plant, 2-3 ft. high, bearing large, white, long stemmed flowers in summer. Particularly fine varieties are Mayfield Giant and Rent payer. *Buphthalmum salicifolium*, another ox eye, bears large bright yellow flowers in late summer; it grows 2 ft. high. Propagation is by division in autumn.

OXFORD FRAME. A characteristic of the Oxford picture frame is the arrangement of the corners, which cross or overlap, and are not mitred in the usual way. It can be made in any wood, though one of the hardwoods, such as oak, is perhaps the most appropriate. The frame can be plain, or have chamfered edges. The Oxford frame is so called because it was adopted as a decoration on the covers of devotional books issued by the Oxford University Press. It was first used for enclosing religious texts.

OXFORD SHIRTING. The most usual pattern of Oxford shirting is a neat check in blue and white or red and white. It is rather warmer and thicker than ordinary calico. The pattern goes through the material.

OX GALL. Purified ox bile is sometimes used in medicine, chiefly as a laxative. It

stimulates the action of the liver and emulsifies fats. It also acts as an antiseptic. The dose is 5 to 75 gr. of fresh ox bile, which may be taken as a bolus, wrapped up in wafer paper or in capsules.

Oxidation. See Rust; Verdigris.

OXIDIZING: Of Metals. Oxidizing is a term given to the coloration of metal objects by changing the surface to a brown-bronze or black tint by a chemical or electro-chemical process. As every metal is attacked by chemicals in varying degrees and with various results it is best to treat each separately. In general there are three methods, chemical, electro-deposition, and heat treatments, which latter may or may not introduce chemical changes in the surface.

The amateur can electro-plate on base metals some of the finer metals, such as copper, silver, nickel, brass or gold, with a view to applying an oxidizing process. Among these preparatory processes brassing may be mentioned, silver, nickel and copper plating being referred to under the heading of electro plating (q.v.). It is usual to adopt a brass coating on the baser metals, iron, zinc, white metal alloys, etc. The finishing coat for oxidizing may be applied as in the case of a solid brass. The electro-deposit should be thick enough to withstand the penetration of the chemicals used in colouring.

Most of the chemicals employed are highly poisonous, and the greatest care should be taken in handling them and in disposing of the spent solutions so that no danger to animals or human beings is incurred.

The brass plating bath may be made of 1 oz. each of zinc and copper sulphate, 2 oz. of carbonate of potash, and 3 oz. of cyanide of potassium. The first two are dissolved in hot water, the potassium carbonate separately, and added a little at a time. The cyanide is made up into a 25 per cent solution and mixed with the others, stirring the bath all the while, the final result being a muddy yellow liquid of about 2½ pints in bulk.

The solution is boiled for about half an hour, filtered, and watered out to 2½ pints. The intensity of the current largely controls the depositing. If the coating is too white, denoting the zinc, a reduction of the current will deposit more copper. Brass may be used

for the anode, but separate strips of copper and zinc are perhaps better. It is best to deposit mainly copper towards the end of the process. For coppering only, the solution is the same except for the zinc sulphate, and a copper anode would obviously be employed. The processes involving electro deposition require electrical power of low voltage and comparatively large amperage. The article on Electro-plating should be consulted for further details.

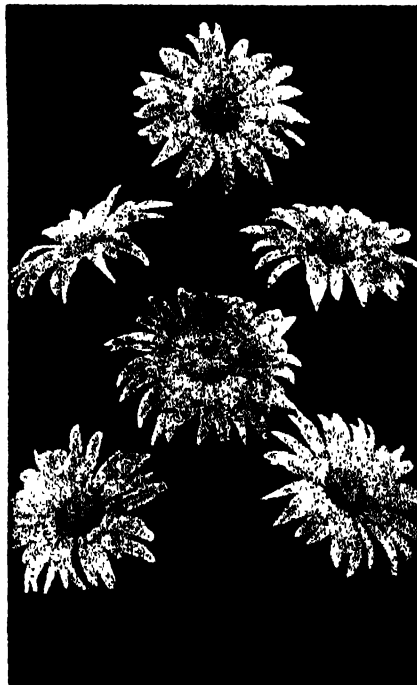
Treatment of Silver. Silver oxidizing is a process with quite a misleading name, as silver oxide is not formed, and is not a part of the colouring film. Sulphur is the chief agent. For oxidizing silver or silver plated articles from light golden to brownish black a hot solution of barium sulphide, 1 oz. to the gallon of water, is often employed. The work is not just emerging from a plating process, must be cleaned in a hot potash solution, rinsed, and given an acid dip, swelling afterwards in a large body of water, and then passed through a cyanide dip, rinsed in hot water, and dried. For producing a matt surface, the acid dip is composed of sulphuric acid, 1 part; nitric acid, 2 parts; sodium chloride (common salt) and zinc sulphate, each about one-tenth of an ounce to the pint.

When in the oxidizing solution the silver work is shaken about until the desired blue-black density is obtained. It is afterwards rinsed in boiling water. Oxidized silver work can be locally lightened as desired. Brushing with bristle brushes and pumice powder will give a grey colour, and the original silver may be exposed where necessary for artistic effect by rubbing in the pumice powder with the fingers. Varnishing may be accomplished with a colourless varnish of the nitro cellulose type, or one of the proprietary brands of lacquer may be used.

Another oxidizing formula is ½ oz. of potassium sulphide and 1 oz. of ammonium carbonate to the quart. The solutions are mixed separately and worked hot. This coating is quite robust, and will stand the scratch brushing process employed in ordinary plating. The work only requires immersing for a short period. To produce a matt, or dead surface, the article should be dipped in a sulphate of copper bath, after electro plating with silver in the ordinary way. A frosted white results, and the whole or portions of the work may be treated to obtain the desired effect.

The paste method involves a mixture of plumbago (black lead) and turpentine with a little red ochre or rouge. It is spread over the work and allowed to dry. The parts in relief in the article are then rubbed with a chamois leather or soft rag dipped in methylated spirit. This is only applicable to engraved, moulded, or chased articles, and, with such, gives the old silver effect. The work can be cleaned off in a caustic potash or cyanide bath. Sulphuring silver gives a blued steel colour. The work is subjected to the action of sulphur fumes in a tin box with a tray to hold red hot charcoal or cinders. Powdered sulphur is spread over the cinders and the lid closed with the work suspended in the fumes. The work must be quite clean both chemically and mechanically.

Oxidizing Copper. For copper a solution of ammonium sulphide, ½ to 1 oz. to the quart of water, is used. The depth of tone, light brown to black, depends on the time of immersion, and the temperature of the bath, and the colour is more completely controlled if the bath is not hot. The work can be lightly scratch-brushed and rinsed. The uniformity of colour, independently of the cleanliness of the work, depends on the purity of the copper; therefore, it is better with objects that have been coppered by electro-deposition. In any case, a copper article might be passed through a copper plating



Ox-eye Daisy. Large white blooms of an easily grown plant.

bath as a preliminary, to improve the surface for oxidizing.

Potassium sulphide, $\frac{1}{4}$ oz. to the quart of water, with a few drops of ammonia, provides a brown tone imitating Japanese bronze work. The solution is used warm. Copper nitrate, 8 oz. to the pint of water, gives a deep black tone. It is used warm and the work should be immersed several times, allowing it to dry between the dippings. Brass oxidizing is more difficult to control and to predetermine in the matter of colour, because of the varying characteristics of the alloy. Such work is often plated with copper first.

Iron and Steel. In iron and steel oxidizing, brown colours may be obtained by covering the work with a paste of antimony chloride and olive oil in equal parts and heating it slightly for 12 hours. The paste is rubbed off with a soft cloth and finished with a waxed brush. The work requires a preliminary cleaning in a pickle of nitric acid. A black colour may be obtained on iron or steel by an immersion in a hot solution of sodium thio-sulphate, $\frac{1}{4}$ oz. to the pint, and greys in a hot pickle made by diluting a mixture of 2 oz. of arsenious oxide in strong hydrochloric acid in one gallon of water. The heat treatment of iron and steel by the Bower-Burff process provides a protective coating of black oxide of iron, Fe_3O_4 , and involves heating the work to redness in superheated steam.

Perfect cleanliness is absolutely necessary in the colouring of metals by any of the processes described, and it must be remembered that acids do not remove grease, and contact with oily or naturally greasy fingers should be avoided. If ostensibly clean objects are handled promiscuously before oxidizing they are likely to show marks where the oxidizing reactions have been prevented by the finger marks. The use of rubber finger stalls or gloves is to be recommended in all operations where they can be employed. Permanent results are also often dependent on the final lacquering, many suitable coloured and colourless varnishes being obtainable. See Bronzing; Electro-plating; Patina.

Ox-lip. This is the popular name of *Primula elatior*. See *Primula*.

OX-TAIL SOUP. Cut into joints 2 ox tails, dividing the pieces in as uniform a size as possible, and soak them for an hour in cold water, adding $\frac{1}{4}$ oz. salt to 3 pints of water. Remove the pieces and wipe them dry, then fry them in 2 oz. margarine or clarified dripping until of a rich brown colour. Put them into a stewpan with 2 quarts stock, 1 good-sized onion stuffed with 2 cloves, 1 carrot, 3 sticks of celery, or celery seed if the fresh vegetable is not available, and a bouquet garni. Let all boil up, skim, and simmer for 3 hours or until the meat is tender.

Remove the pieces of tail and thicken the liquor after carefully cleaning it of fat. The thickening should be made by frying 2 oz. flour in 1 oz. butter or margarine and then thinning it to a liquid with a little stock. Add by degrees to the soup, and boil for a few minutes. Meanwhile, boil in clear stock or water a medium-sized carrot, turnip, and onion, prepared and cut in julienne shape. Strain when cooked. Put the pieces of tail into a tureen and strain the soup, boiling, over them, then add the shredded vegetables. Give the soup a stir and serve hot. Keep the tails hot while thickening the soup. See Casserole.

OX TONGUE. In town an ox tongue can sometimes be procured ready pickled from the butcher, and all that remains to be done is to soak it, thoroughly wash it, and boil it, putting it into cold water and letting it come very slowly to the boil. After it has been skinned it should simmer $3\frac{1}{2}$ to 4 hours, according to size, and be allowed to go cold in

the water in which it has boiled. Take it up, remove the white skin and trim the root. The tongue may then be skewered into shape on a dish, with a rolling pin underneath to support it. When cold, remove rolling-pin and pour liquid glaze over to coat the tongue. Or it may be pressed into a round mould or cake-tin and covered with a plate, and a weight on top and left till cold.

A fresh tongue, one that has not been pickled, is sometimes prepared and cooked, but before boiling it blanch it in order to remove the white skin. The root must be well trimmed, and it is better to soak the tongue before blanching it. Serve hot with a piquant



Ox Tongue, shaped and pressed, a delicious cold dish for breakfast or supper

sauce. When boiling a fresh tongue use stock instead of water, and add soup vegetables to flavour it. See Glaze.

OXYGEN. About one-fifth of the atmosphere consists of oxygen, which is a colourless, tasteless gas. By the act of breathing, oxygen in the air is drawn into the lungs and becomes absorbed by the blood, which gives out, in exchange, carbonic acid gas.

Oxygen is also necessary to combustion. The air in a closed room becomes used up by breathing and by using coal gas or candles for lighting, its place being taken by carbonic acid. This carbonic acid if it accumulates beyond a certain quantity makes the air unfit for people to breathe. That is why it is so necessary to have a room well ventilated. An open fireplace is of great assistance in this; fresh air should be admitted by the windows.

For some types of poisoning, or over-doses of narcotics, and for respiratory failure due to partial drowning, electric shock, etc., oxygen mixed with 7 per cent. of carbon dioxide is administered to the patient through a mask and tube. The flow of the mixture can be fixed, or controlled by the patient's lung action. Oxygen is administered also to persons suffering from a dangerous illness. The oxygen passes from a cylinder, through a metering device and pressure gauge, to a rubber tube leading to the nose-piece, with an oxygen reservoir between cylinder and patient.

Sometimes the patient is placed in an oxygen tent. This is a transparent covering which hermetically seals the patient from the atmosphere, and into which oxygen is pumped. No mask is required; consequently, oxygen tents are used to strengthen the tenuous hold on life of premature babies. In heart failure, twenty minutes of continuous oxygen inhalation in every hour is a curative measure.

OXYMEL. An old-fashioned yet valuable remedy for cold and sore throat is made of vinegar and honey, and is known as oxymel. Mix together 2 oz. of vinegar and 2 oz. of water and add to 1 lb. of honey. Stir well together, and put in a jar, which should be kept covered. Give as a dose a teaspoonful three or four times a day.

By mixing squill vinegar with the honey, oxymel of squill is formed. It is obtained made up from a chemist's. This is used as an expectorant, the dose for an adult being $\frac{1}{2}$ to 1 dram. It is a favourite remedy in the bronchial troubles of children. A child of six

would be given a fourth of a teaspoonful of it in water every three or four hours.

OYSTER. Although oysters do not suit everyone, they are to most people very digestible when eaten raw. Cooking makes them hard and tough, and they are not recommended in this state to people whose digestion is weak. The composition of the oyster is as follows. Water, 88 per cent.; protein, 6 per cent.; carbohydrate, 3 or 4 per cent. It should be remembered that they are out of season during the four months of the year whose names do not contain an "r."

To prepare oysters to be eaten raw, first scrub the shells. Hold the oyster in a thickly folded cloth in the palm of the left hand, with the hollowed shell downwards to hold the liquor. Work an oyster-knife, or a sharp tin-opener, between the two shells with a see-saw action till enough of the knife is inserted to force them apart. Remove all bits of shell. Serve the oysters in the deep halves of their shells, standing them on ice if possible. Lemon cayenne, and thin brown bread and butter should be served. Grated horseradish, Tabasco sauce, and celery (when in season), are also liked by some people. Raw oysters can be served as cocktails (q.v.).

Cooking Oysters. In cookery, the oyster is used for small savoury dishes, stuffing, and sauce. It is sometimes bearded, blanched, and added with the strained liquor to a steak-pie or pudding. It is also fried in a light fritter batter, after coating with egg and breadcrumbs.

Oyster Aigrette. This dish can be made by putting $\frac{1}{2}$ pint water and 1 oz. butter in a pan over the heat, and when they boil adding to them $\frac{1}{4}$ oz. sieved Vienna flour. Take the pan from the heat, beat its contents until they are smooth, and then cook them over gentle heat until the mixture leaves the sides of the pan. Let the mixture cool a little, then beat in separately 2 eggs and an extra yolk, and add 3 oz. grated Parmesan cheese, and seasoning to taste. Turn the whole on to a plate, to cool, then beard a dozen oysters, and season them with cayenne and lemon juice.

Have ready a deep pan of smoking hot fat, and into it dip a dessertspoon. Then half fill the latter with some of the cheese mixture, make a hollow in the centre, and in it lay an oyster, covering it up with a little more of the mixture. Drop the aigrette from the spoon into the pan; prepare 11 more in the same way, and fry them slowly for about 5 min. After draining, serve them with thin rolled brown bread and butter, cayenne, and lemon.

Oyster Force-meat. Oyster force-meat is used for stuffing boiled or roast turkey. To make it, beard 18 oysters and cut them into quarters, then mix them with $\frac{1}{2}$ pint breadcrumbs, $\frac{1}{2}$ teaspoonful dried mixed herbs, 1 oz. finely chopped suet, and seasoning to taste. Bind the mixture with a beaten egg, adding more beaten egg or a little milk if necessary.

Oyster Fricassee. A fricassee of oysters can be made by boiling up a dozen oysters in their liquor, straining them, and then reserving the liquor. Melt 1 oz. butter in a small pan, stir in the same quantity of flour, and then add the oyster liquor by degrees, stirring the whole until it boils. Continue cooking for a few minutes, then move the pan to the side of the heat, and add the yolks of 2 eggs, the oysters, a squeeze of lemon juice, and seasoning to taste. Dry toast should be served with this dish, which is suitable for invalids.

Oyster Patty. The cases are prepared first for oyster patties. Take $\frac{1}{2}$ lb. best puff paste for these, and roll it out about $\frac{1}{4}$ in. thick or rather more. It is impossible to give the exact depth, as so much depends on the pastry maker and the size required. Cut out 10 or 12 rounds of paste with a small round cutter. Mark out a smaller round in the centre, using another

cutter not quite so large, but do not cut right through.

Cook till the pastry is quite done and a fine brown. Now lift the cases on to a wire tray, remove the small centre round, scoop out any uncooked paste and lay aside ready for the filling.

Blanch 2 dozen oysters for a few minutes, drain and beard them, and cut each in two. Now mix them with a rich white sauce, add a wineglassful of white wine and some of the oyster liquor. Fill the cases, cover with the lids, and re-heat or serve cold. An average size for the case is $2\frac{1}{2}$ to 3 in. across.

Oyster Sauce. Blanch 18 oysters in their own liquor, adding a glass of white wine, beard them, and clarify and save the liquor. Put into a saucepan 2 oz. butter and, when melted, cook in it for 4 min., without browning, the same amount of flour. Add by degrees 1 pint warm milk or white stock and simmer till all is cooked and quite smooth. Add seasoning, a little grated nutmeg, the oyster liquor, 1 teaspoonful lemon juice, also the oysters. Heat up before serving. See Patty; Soufflé.

OYSTER GRAIN. This term is used by furniture collectors and others. It refers to veneered pieces of walnut which, owing to the appearance and direction of the grain, resemble the insides of oyster shells. It is frequently found on Queen Anne furniture. See Queen Anne Style.

OYSTER SHELL. When heated until they crumble, or when ground, oyster shells make a useful addition to potting composts. These shells can also be put to good use in a fowl run if they are first crushed to a fine powder. In this form they supply hens with the necessary amount of lime to ensure the laying of hardshelled eggs.

OYSTER SHELL SCALE. Various fruit trees are attacked by this scale insect. The Ministry of Agriculture suggests the following methods of dealing with the pest.

The oyster shell scale is much reduced in numbers by the attacks of its natural enemies. One valuable enemy is a jet black ladybird with two red spots on its wing cases. When buying young stock all trees bearing scales or showing the characteristic little white scars should be rejected, unless the seller can guarantee that the stock has been fumigated with hydrocyanic acid gas or otherwise cleared of scales. The scale insects can be killed by thoroughly washing the trees in winter with lime-sulphur.

OZONE. When electric currents are passed through oxygen, as in working an electrical machine, a peculiar odour becomes noticeable. This is due to the formation of ozone, which is a form of oxygen. It exists in the air, but in populous neighbourhoods becomes used up by combining with carbon particles in the air. It is abundant in the air at the seaside and up mountains. It is a powerful oxidizing agent, and in virtue of this property is employed as a disinfectant. An excess of ozone may produce headache, cough, etc. See Oxygen.

PACK. In the medical sense a pack is a covering in which the patient's body is swathed. A hot pack is used to promote perspiration in disorders of the kidneys and other complaints; and a cold pack for reducing the temperature in high fevers. See Cold Pack; Hot Pack.

PACKING. In packing clothes, the first thing to decide is the number and kind of boxes required, which will vary according to the contemplated length of absence from home, the number of persons travelling, and the nature of the wardrobe that it will be necessary

to take. The expanding type of suitcase often is sufficient for the short holiday; or another convenient form of luggage is a very light suitcase, with a stronger one for heavier articles.

To pack, place the suitcases on stands or on a bed, when care should be taken to spread something over the coverlet first. Into one of the cases should be put, well wrapped up, boots and shoes. Books, woollen garments, stockings, collar box, and any hard or heavy articles are wedged in as flat as possible, so that at the top there is room to lay heavy outer sports clothes and rolled-up felt, woollen, or cloth hats or caps.

In the other suitcase a woman would put light underwear, night wear and dressing gown, laid flat between layers of tissue paper; then a light coat, frocks or suits, with a good roll of tissue paper wherever they are folded.

Packing Men's Clothes

A man might pack the second suitcase in this way: To obtain full advantage of the flat surface, begin with evening clothes folded according to the length of the case, with a layer of soft paper at each fold. Then, sandwiched between pyjamas and light underwear, come the shirts. Evening shirts should be reversed the way of the laundry, folding them so that the fronts are inside and thus protected, the ends being carefully tucked into the neck-band. Place all these flat with handkerchiefs and tie-case nicely levelled against them, and then on the top fold the suits and flannels.

Men's clothes should be tightly packed, so if the suitcase is not quite full, it is better to put in an extra garment than to risk the shifting about of all the contents. A heavy dressing-gown, if required, may be put into the first suitcase, a thin one into the second. All toilet things, including bottles, can go into the small case, and as this would be carried, there is little risk of breakage.

For the luxurious traveller, the American wardrobe trunk saves much trouble. These travelling wardrobes, however, are too expensive for general use, so when a large quantity of clothes has to be packed evening and other dainty frocks should be carefully folded, with plenty of soft paper, in cardboard boxes, which keeps off the pressure of heavier clothes, and placed at the bottom of a trunk. When packing hats into a tray or hat-box the insides of the hats may be filled with such articles as handkerchiefs, gloves, and ties.

A large hold-all and a big folding basket are both excellent things to keep open till the last moment for forgotten family necessities. A baby's things can be packed in its bath with fitted lid strapped securely on to it, and where a perambulator is taken a number of necessary things can be stowed away in it under the waterproof cover. Careful overhauling of the

family wardrobe several days before the actual day of departure greatly facilitates packing.

Packing for ordinary domestic purposes usually calls for a strong container, and some wood wool, or shavings, or crumpled clean newspaper. A bulky article, such as a piece of furniture or a perambulator, can be wrapped in sacking, joined with string stitches, plus ropes of straw around any exposed parts.

A perambulator or other wheeled item should have the wheels left free to rotate.

Packing Fruit and Flowers. The container for these should be as light as is consistent with strength. In the actual packing, aim should be to prevent movement of the contents, and crushing. Fruit to be packed should be clean, dry, and not over-ripe, and (if large enough) separately wrapped in soft tissue paper.

A single layer should be placed on dry and clean hay or straw, or crumpled news-paper, or dry sawdust, or granulated cork, in the bottom of the box. Subsequent layers of fruit are each covered with some of the packing, until the box is full.

The lid is then secured with string; or, if wooden, nailed. In addition to destination labels (one tied on, one stuck or nailed on), the package should be plainly labelled FRUIT (or flowers), FRAGILE, WITH CARE.

Flowers for packing should be fresh, not fully open, and tied in bunches each of not more than a dozen blooms. The bunches should be placed closely together, head to tail, and each layer held down with string stretched from side to side of the box. The stems should not be wet, and only soft and dry paper should be used as packing.

PAD. This word is used to denote several different articles. There is the writing pad or block; the boot pad, made of velvet, for polishing boots; the pad of lint, or gauze and cotton wool, used in surgical dressings, and the ink pad used with a rubber stamp. See Dressing; First Aid; Rubber Stamp.

PADLOCK. This is a form of detachable lock, intended to hang on the part to be fastened. The usual type comprises a case containing the lock mechanism having on one part of it a shackle or curved metal bar, so that it can be hinged or turned, for passing through a staple, or staples, and the opposite end fastened to the lock case by the lock bolt and mechanism. Padlocks are made of japanned or galvanized iron. Common ones have a one-wheel ward, or a sham level mechanism. Better types have two or three ward wheels and levers, the mechanism being similar in principle to other forms of lock. The cylinder or pin tumbler system is adapted to the mechanism of the padlock, and such locks possess all the advantages of that system. Some very

small padlocks are made with a simple spring lock. Another type, with a key, is convenient for locking small articles, e.g. cash boxes. See Bolt; Door; Lock.

PAGODA TREE.

This is a small family of hardy and greenhouse flowering shrubs, known as *Sophora*. The only one worthy of note, except in large collections, is *S. japonica*, a summer-leaving shrub with bluish-green leaves and white flowers. It should be planted in



Packing. Fruit will travel safely if each item is wrapped in tissue paper and placed between layers of crumpled paper, or granulated cork, or sawdust.

autumn, pruned in February, and is propagated by seeds or by division. There are a few varieties which need only ordinary greenhouse treatment. See Shrub.

PAILLASSE. This is an under-mattress, used for placing beneath a mattress of a better kind, and often used in camping. Originally, it was a long bag of canvas, or other stout material, stuffed with clean long straw, or with chaff.

PAIN : Its Relief. Pain is of many different kinds. It may be constant, or only occurring at intervals. Sometime it is dull and aching as in chronic rheumatism or sharp and cutting, as in pleurisy, throbbing as in the case of an abscess, or burning or smarting, as when the skin is inflamed. Pain is not always felt at the exact spot where the harm is. For instance, neuralgia may be felt in the head, and the cause be a bad tooth.

One great use of pain is that it draws attention to disease which might otherwise be overlooked. In times of great excitement or when the mind is fully occupied, it is possible to forget even severe pain. Pain is, however, very exhausting, and if only for that reason calls for relief.

In treatment the first consideration is, if possible, to get at the root of the trouble. If an unsound tooth is causing neuralgia

have it removed. An abscess in the same way should be lanced. It is generally possible to relieve pain, for the time at least, by giving drugs, which quieten the nerves and dull the senses, either simple analgesics like phenacetin or aspirin or narcotics. Care must be taken in using anaesthetic remedies and narcotics should only be taken under medical observation.

For home treatment, nothing is more likely to succeed in soothing pain than heat, especially when it is combined with moisture. For internal pains a hot-water bottle may be useful, or fomentations (q.v.) of hot water. For pain in the chest, arising from cold, a mustard and linseed poultice is a soothing remedy. A mustard poultice may also relieve lumbago.

Electrical current, are often successful, and in some cases ionization. Friction will sometimes give relief in muscular pain as in chronic rheumatism, and the use of a little camphor, well rubbed in by the hand will often ease joints that are stiff. A strong cup of coffee will often remove a bad headache. It must be remembered that quiet is often desired by persons in pain, and this together with rest and warmth, will go far to relieve many forms of suffering. See Embrication. Fomentation; Linseed; Mustard; Neuralgia. Poultice; etc.

obtainable, and although the genuine turpentine is to be preferred, the substitutes answer very well for most paint work. Pigments are finely ground colouring materials used to colour paint for ornamental purposes and to give opacity. They are made from various animal and mineral substances, and are obtainable either as finely ground powders or ground in oil. In the latter case they are paste-like in substance, and are used in that form for tinting oil paint. Knotting and fillers ready for use can be purchased from most oil shops.

Ready mixed paints, if made by a reputable firm, are very convenient to the amateur; but for matching up existing work, or preparing a special tint, it is preferable to use white lead, or zinc white, diluted with linseed oil or turpentine, and stained or coloured by mixing with it sufficient of the desired colour to impart the requisite tint. Many of the ready mixed paints are available either in the form of the common paint, which dries with a lustreless surface, or with the addition of a little varnish, which results in the paint drying with a semi-glossy surface. Generally the common paint answers very well for the second coat and the varnish paint for the finishing coat. Water paints are really a form of distemper, in paste or powder form, and only require to be mixed with water. For interiors they are particularly effective.

The technique for applying cellulose finishes is explained in the article on Enamel (q.v.).

To carry out painting work properly the amateur should possess several clean tins with handles, known as painters' kettles, a large-sized sponge, a good piece of pumice-stone, a blow lamp for burning off the old paint, a scraper, or stripping knife, hacking and stopping knives for cleaning out the bad places and working the stopping into them. These are illustrated in Fig. 1.

When the colours are to be blended, a clean earthenware jar is required for mixing, a palette and palette knife, and some fine mullin for straining are necessary. A dusting brush, leather, clean duster, and regular painter's apron are very handy, and the amateur will find it a good plan to wear a pair of old gloves.

Paint Brushes. A selection of brushes for general use consists of an oval ground brush about 2 in. wide, a varnish brush about 1 in. wide, two or three sash tools of various sizes, and a ditch about 1 in. wide for painting the edges of narrow work. The best brushes are made of hog's bristles; some are adulterated by the addition of vegetable fibre.

The size of a brush is denoted by a number, 1-0, up to 8-0, and 10-0, the latter being for house painters. In some cases the bristles are bound to the stock or handle with cord or twine, in others with copper wire or tin band or ferrule. The bristles are arranged to form flat, oval, or round brushes, and for general purposes the oval is preferred. Smaller sizes, termed sash tools, are useful when painting the smaller surfaces in door and window frames.

There are also brushes for dusting the surface preparatory to putting on the colour. They are usually round in shape, with much longer bristle than ordinary brushes, curving outward. Brushes for varnish are of a finer bristle, and flat or oval; the former are bound with tin, and will be found most useful for general purposes.

A brush known as a stippler is used for going over painted surfaces whilst still wet to remove brush marks. It is a large, flat brush, rather wider than a boot brush, and the bristles are set so closely together that when the brush is lightly and evenly dabbed all over the surface, a minute and even granulation results.

Brushes for use with cellulose finishes should be set in rubber, as the solvent employed

PAINTS & PAINTING IN HOME DECORATION

The Best Methods and Materials for Paint Work and its Cleaning

The following is one of the many articles that deal with the question of decorating the home, others that fall into this category include Enamel, Graining, Paneling, Paperhanging, etc.

Certain precautions have to be exercised in paint work of almost every kind. If the paint is to dry nicely, the surface to which it is applied must be clean and free from grease or dirt; the paint itself must be of good quality and suited to the class of work; while the material to be painted must be prepared by coating it with mixtures known under such names as fillers, stopping and undercoating. The brush also should be of suitable shape, size and quality.

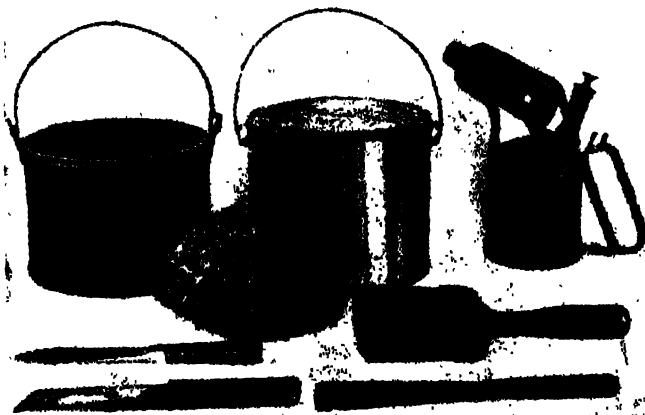
Paint is applied to improve the appearance and to assist in the preservation of the object painted. It has also a sanitary and hygienic value. If the surface to be painted is greasy and dirty, and the paint is applied to it in this state, it is obvious that the dirt will remain, although covered by the paint. The proper method is to remove the dirt and grease before applying the paint, and this can be done by scrubbing with hot water and soda.

The Ingredients of Paint. In connexion with the home, painting is generally done with oil colour paint, but in a more comprehensive sense it includes the use of water paints and other decorative material applied in the form of paint. There are also available the various nitro-cellulose finishes (see Enamel). Oil paints often have white lead as a base, or body. This material has great covering power and weathers well, but as it is very poisonous, a zinc white base, composed of oxide of zinc which does not possess the poisonous qualities of white lead, is largely employed. The base is diluted with a thinner, generally composed of linseed oil, and both this and the base should be of first quality. Oil of turpentine, com-

monly called turps, is also used for thinning the base and making the paint more easily worked, but it reduces the protective qualities of the paint, and if used in excess produces a thin, quick drying coat, which dries with a dead or flat surface.

For the purpose of hastening the drying of the oil in the paint, materials known as driers are used. For driers, terelene is often added to make the paint dry quickly, but etharge, lead acetate, zinc sulphate, and red lead are very much used. A common practice is to embody with the base some other material, known as a filler, which is added by paint makers, and varies according to the purpose of the paint. Silica or barytes may be used for a paint to be applied to woodwork, while silicates, alumina, whiting, and gypsum are used in paint for masonry and metal work.

The ordinary linseed oil is obtainable in two forms, raw and boiled. The raw oil is used for delicate work, pale colours, and internal work, and the boiled oil for general external use. Owing to the cost of turpentine, a number of substitutes for this material are



Paint. Fig. 1. Implements which are essential for the amateur painter. Reading in rows from left to right: paint kettle, tin of paint, blow lamp; putty knife, sponge, dusting brush; hacking knife, stripping knife.

would dissolve the binding material of the ordinary type of brush.

On no account should a new brush be put into immediate use without some previous preparation. The bristles will have become dry since the brush was made and are liable to come out on to the painted surface, spoiling the work and ruining the brush. All new brushes should be soaked in clean cold water for at least 24 hours. This will cause the bristles and the stock to swell, so that they will not so readily part company. Brushes bound with a tin band should not be soaked for quite so long, or the band may burst.

New brushes should not be placed in an upright position when soaking, but should be laid in a flat, shallow vessel, and thus also applies to brushes that have been lying aside unused for some time. Brushes should never be put away without cleaning them of paint; this can be done by washing thoroughly in a little turpentine, then rubbing dry with a clean cloth. A loop of string should be tied on the end, and the brush hung up, the bristles being covered with paper to exclude dust. Treated in this manner, brushes will last much longer.

Exterior Work. As an example of outdoor work, suppose it is desired to paint the rain-water gutters and down pipes with, for example, middle purple brown. The first step is to rub down the old paintwork, if in fair condition, give it a coat of anti-rust priming, and after this is dry apply two coats of ready mixed varnish paint (Fig. 3). A wooden fence, if in fair condition, should first be brushed down with a stiff bristle brush, like a scrubbing brush, dusted with a dusting brush, given a good coat of undercoating of any reputable make intended for outside work, or known as outside quality, and then given a coat of the common ready mixed paint; when this is dry and hard a coat of ready mixed varnish paint is applied. If the work is not in good condition, the old paint should be burned off with a blow lamp, the surface levelled up with stopping, and the painting operations proceeded with as if for new work.

On the exterior woodwork of the house the windows may require the old paint to be burnt off with a blow lamp. Fig. 4 shows this operation in progress. When the paint is slightly warmed and burnt with the flame from the blow lamp, this has the effect of softening it, and it is then cleaned off with a stripping-knife, as shown. The work should receive one or two coats of good quality outside undercoating or stopping, and be finished with two coats of ready mixed paint.

A door is treated in the same way, except that it should receive particular attention in the way of stopping all the cracks and holes. This may be effected with any of the special stoppings sold for the purpose, or ordinary putty may be used if the work be given a primary coat of undercoating, the putty being applied after this has dried.

If a particularly good finish is required, the work should be well sandpapered when the undercoating is thoroughly dry. Exterior

stone or cement work should be prepared by brushing it over with a hard brush, filling in the holes or cracks with Keene's cement and preparing the surface with red lead priming. This is followed with a coat of stopping or undercoating of outside quality, and finished with the paint, or may be painted with liquid cement, if cement colour is preferred.

Indoor Work. Interior work is prepared in the same way as the exterior, except that more attention should be given to the surface to make it as smooth as possible. This is followed with a primer or undercoating of

dust it down, and give it a coat of undercoating or flat paint, and then finish it with a glossy or flat paint, whichever is desired.

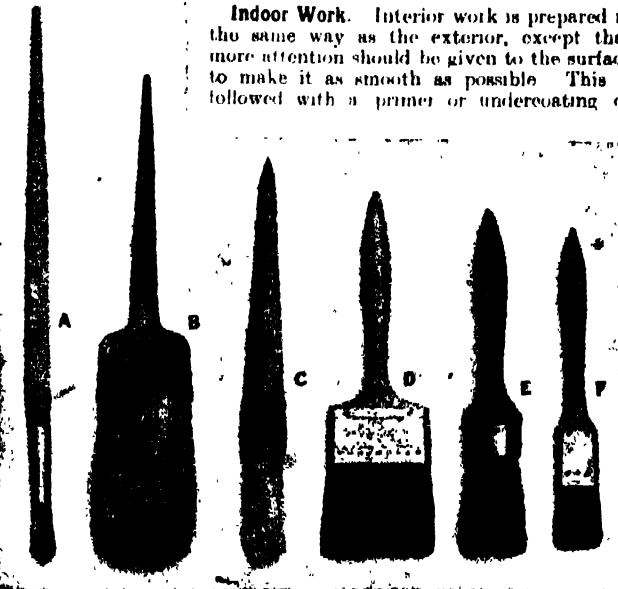
The flat, or wall paint, as they are called are intended specially for painting walls, but if the surface is new plaster the result is seldom entirely satisfactory. The procedure is to apply a priming coat and follow this with a flat colour, using the primer supplied by the makers of the wall paint. Water paints are generally applied to plaster work after it has been given a coat of size or priming, which ever is recommended by the makers of the particular paint to be used.

Wooden floors are often painted in the same way as any other work, so far as the preliminary cleaning and preparing are concerned, but the finishing may be carried out with one of the special floor paints.

Ironwork. The decoration or repainting of a stove is often carried out with a good quality Brunswick black when a glossy effect is required, but if a dull or so called antique black is wanted, it is best to use Berlin black. If either of these colours is too thick to work nicely, it may be thinned with oil of turpentine. For painting radiators, interior water-pipe, cisterns, and the like, an aluminium paint is very effective. The first thing is to thoroughly clean the ironwork, removing all traces of rust either by scraping or by using a wire brush, as in Fig. 5. Water should never be applied to metal work; if necessary use instead one of the recognized paint removers, or wipe over the metal work with a clean piece of rag saturated in turpentine.

Applying paint with a brush is slow and laborious work, particularly if large surfaces have to be covered; and unless the work is carefully done the finished job will show unsightly brushmarks. There are several devices available to make easier the task of the painter, by dispensing with brushes. One such apparatus is the Decoroller, illustrated in Fig. 7. It consists of a wooden roller 7 in. long, covered with lamb's wool, and with a handle mounted on one side. A metal tray is provided for holding the paint during use.

The surface to be painted is cleaned and prepared in the usual way. A quantity of paint is then poured into the tray, which is open at one end and has feet to make the bottom slope to the rear, so that the paint gathers in the lower end. The roller



Paint. Fig. 2. Common types of paint brush in everyday use. A, long-handled brush for decorative work. B, washing-off brush. C, sash tool for general work. D, small distemper brush. E, metal-bound varnish brush. F, ground flat bristle brush for enamel work.

inside quality, and the work then painted in the desired colour.

In painting new wood all the knots should first be brushed over with knotting and then given a coat of priming or undercoating, the work well glasspapered and cracks stopped up where necessary. To stop the pores of the wood and make a good foundation for the paint, apply one coat of stopping or first undercoat, sandpaper this when it is quite dry.



Paint. Fig. 3. Applying anti-rust priming to a rain-water pipe. Fig. 4. Process of burning and scraping off the old paint by means of a blow lamp and stripping-knife. Fig. 5. Cleaning radiator pipes with a wire brush before applying a new coat of paint.



PORCELAINS - WONDERFUL PRODUCTIONS OF CHINESE POTTERS

1. Enamelled plate of Liang-Hsi period (4th-5th c.). 2. Bottle of Kang-Hsi period. 3. Enamelled teapot of Liang-Hsi period. 4. Vase of Liang-Hsi period. 5. Enamelled plate of Liang-Hsi period. 6. Vase of Liang-Hsi period. 7. Enamelled plate of Liang-Hsi period. 8. Enamelled plate of Liang-Hsi period. 9. Enamelled plate of Liang-Hsi period. 10. Enamelled plate of Liang-Hsi period. 11. Enamelled plate of Liang-Hsi period. 12. Enamelled plate of Liang-Hsi period. 13. Enamelled plate of Liang-Hsi period. 14. Enamelled plate of Liang-Hsi period. 15. Enamelled plate of Liang-Hsi period. 16. Enamelled plate of Liang-Hsi period. 17. Enamelled plate of Liang-Hsi period. 18. Enamelled plate of Liang-Hsi period.

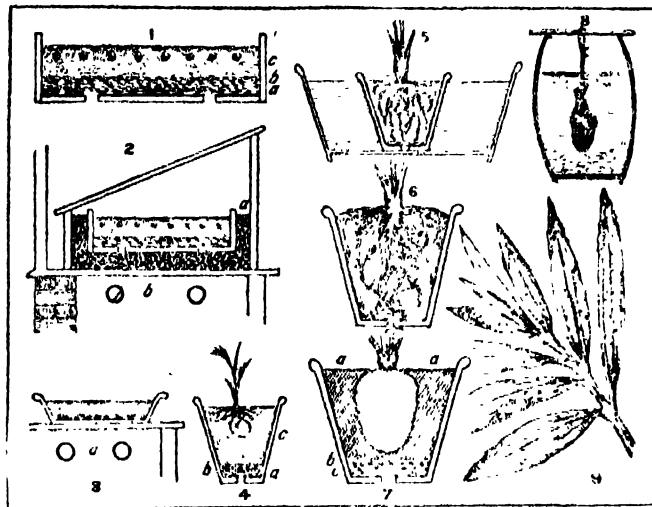
PALM. The common name of several kinds of evergreen plant which are native to tropical and sub-tropical countries. One palm, *chamærops excelsa*, is hardy in sheltered gardens in mild districts in England. Others need the shelter of a heated greenhouse. Several kinds will flourish in a room window. Small plants of this nature are excellent for table decoration. The palms grown under glass in Great Britain include cocon, *geonoma*, *corypha*, *kentia*, *batania*, *rhapis* and *phoenix*.



Palm. The species *Corypha australis*, a decorative pot plant

Planted in a bed of soil in an spacious conservatory most of them will develop into large specimens. But they are generally grown in pots, or tubs, in which they will flourish for years and remain of moderate size. Compost consists of two-thirds loam and one-third peat with sand added freely. Pots and tubs need to be well drained. Propagation is by seeds sown in pots or boxes of soil in a heated greenhouse. The plants need shade from bright sunshine, and they thrive best in moist rather warm conditions.

Cocon *weddelliana* is one of the daintiest of small palms for table decoration. *Flexuosa* and *plumosa* are more vigorous. The fan palm, *corypha australis*, is of less graceful



How to Grow Palms. 1. Sowing the gooseberry-like seeds: a drainage, b leaves, c fine sandy peat. 2. Box plunged in frame: a manure, b heat pipes. 3. Seed soaking for 24 hours before sowing: a heat pipes. 4. Seedling potted: a, crocks; b, cinders, c compost. 5. How to water palms. 6. Root-bound plant needing repotting. 7. Repotting in larger pot: a, new compost firmly rammed round root ball; b, cinders, c drainage. 8. Soot suspended in water for palm manure. 9. Effect of scale insect on palms

growth, but hardier than cocon. Another fan palm is *batania borbonica*, both are suitable for rooms, though their large leaves take up much space. *Geonoma gracilis*, *kentia belmoreana*, and *kentia forsteriana* are in demand for room and window decoration owing to their graceful habit of growth.

The date palm, *phoenix dactylifera*, is of less value in greenhouses and conservatories than *phoenix canariensis*, which develop into a large specimen. The palm called *rhapis flabelliformis* differs from the others in habit of growth: instead of being restricted to a single stem it becomes bushy owing to the suckers which grow up from the base

or fleshy risings on the palms. Jupiter's mount, at the root of the first finger, shows generosity and ambition; if rising excessively, arrogance is denoted; if deficient, selfish coldness. Saturn's mount, at the base of the second finger, indicates prudence and wisdom; if highly developed it denotes occultism, if excessively so a tendency to melancholia, if deficient, insignificance. Apollo's mount, at the base of the third finger, indicates love of beauty, artistic talent, and desire for recognition; if excessive it denotes vanity and love of notoriety at any cost, if deficient,

materialism dominates the rest of the character.

Mercury's mount, at the base of the little finger, indicates love of change and excitement, activity and cheerfulness, good practical capacity, or inventive power; if excessive, it denotes an inordinate desire for gain; if deficient, a lack of brain power. There are two mounts of Mars, one below Mercury's on the percussion of the hand, the other below Jupiter's. If full, both mounts denote courage; if excessive, they indicate tyranny and violence; if deficient, lack of self-command and timidity. Luna's mount, opposite the root of the thumb, indicates imagination and romance; if excessive, love of mystery, caprice, or morbidity; if it is deficient, lack of imagination.

The mount of Venus is the lower part of the thumb, and it is supposed to indicate love of beauty, harmony, and pleasure; if excessive, it denotes inconstancy and luxurious tastes; if deficient, coldness and lack of sympathy.

A hand in which all the mounts are equally developed shows a well-balanced character. In a spatulate hand, a good Mercury's mount indicates scientific ability, with both mounts of Mars full, a soldier or sportsman. In a mixed hand a good Apollo's mount with Luna's well developed denotes the characteristics of a practical artist.

The principal lines of the hand are the lines of life, of the heart, head, fate, fortune, and health. Red lines indicate cheerfulness and vitality; pale lines, weak character; purple lines, melancholy. Chained or broken lines are a sign of obstacles or weakness; wavy lines of periodical bad luck. Double lines are good; sometimes the second line appears by the side of a break, counteracting the misfortune which would otherwise be denoted.

PALMISTRY FOR THE AMATEUR

An Entertaining Feature for a Garden Party

This article, for entertainment only, is one of those that deal with the social and recreational side of life, others in the same class being Evening Party, Garden Party, Amateur Theatre.

The amateur palmist can be quite a successful entertainer at garden and indoor parties and fetes, as a purveyor of amusement. The approach to the subject should be, of course, as entertainment, not as a science.

The set-up is as follows. Palmist and client should be seated at opposite sides of a small table, the client's hands resting on a cushion, palms downwards at first. The palmist proceeds to observe the finger nails, and relative length of fingers to thumb. As indicative of a strong will, the thumb should reach to the middle joint of the first finger. Short-shaped nails are said to be a sign of critical faculty and fondness for detail; round nails, hasty temper; broad nails, sarcasm and love of argument; filbert-shaped nails, refinement, but lack of aggressive power unless allied to a strong thumb. In turning over the hands the palmist holds the palms firmly to ascertain whether they are hard or soft. A hard palm is one of the signs of strength; soft, of luxury. A long palm denotes obstinacy, and selfishness; a wide palm, courage; a narrow, bigotry.

With the hands lying palm upwards they can be classified as one of seven types. The elementary has short stiff fingers, and palm large in proportion, said to indicate small brain power or self-control. The spatulate has wide, flattened-out finger tips, and broad rather thick palm equal in length to middle finger, indicating self-reliance, courage, patriotism, love of property; but if the heart line be poor, arrogance and lack of sympathy. The square hand has squared finger tips and firm,

flat palm, indicating love of order, business acumen, and conventionality, but with undeveloped mounts of Venus and Luna, hypocrisy. The conical hand has tapering fingers and smooth, slender palm, indicating love of beauty, refinement, good taste; but with small thumb and poor headline, laziness and discontent. The philosophic has tapering or square finger tips, and knotted joints, and a long hand, indicating deep reasoning power and appreciation of beauty, with the dominating interest of truth. The psychical type has rounded finger tips, narrow palm, and slender thumb, indicating idealism, imagination, and occultism. The mixed has one finger spatulate, another tapering, and so on, indicating a person with facility for many things, but in a weak hand indicating instability.

The next points to be studied are the mounts



Palmistry. Diagram of left hand illustrating principal lines and significant parts. Fingers: A, Jupiter; B, Saturn; C, Apollo; D, Mercury; three phalanges shown numbered. On the hand, 1, 2, 3, and 4 are mounts of Jupiter, Saturn, Apollo, and Mercury respectively; 5, mount of Luna; 6, mount of Venus; 7 and 8, mounts of Mars. Principal lines: E E, life; F F, head; G G, heart; H H, fate; X X, Apollo

A good life line should be clear cut and surround the base of the thumb, starting from midway between fork of thumb and root of first finger. A break indicates illness or an accident, if shown in the right as well as the left hand. The line of head should go right across the palm and be clearly defined.

The heart line starts beneath Mercury's mount and crosses to Jupiter's. Without branches it indicates a loveless life, forked under the first finger, ideal affection. The line of fate runs up the centre of the hand more or less to Saturn's mount. If this line is clear and long, it may balance a poor life line.

The line of fortune, or Apollo, may start from near the life line, from the fate line or from the heart line, and go to the root of the third finger, denoting success in art, fame, riches, or honour. Should this line be absent, even with a good fate line, the subject will have to work hard with small success. With a well-developed mount of Venus, music or painting is indicated; with a good mount of Luna and forked head line, literature, with a spatulate third finger and full mount of Apollo, dramatic work.

The marriage line is on the percussion of the hand, at the side of Mercury's mount and above the heart line, running horizontally with the latter. An early marriage is indicated by the line being near the root of the finger; midway between that and the heart line the marriage would be about 30.

Should the marriage line be forked on Mercury's mount it is a sign of separation, and many small lines on the percussion denote short love affairs. A second deep line, if the first be cut through, denotes a second marriage. Small vertical lines to the root of the little finger from the marriage line are said to indicate children.

Three good lines across the wrist at the base of the palm are said to denote prosperity and to strengthen the life and fate lines.

PALM OIL. Yellow solid fat, with a violet smell, obtained from the fruit of several species of palm trees, chiefly in E and W Africa. It is used in the manufacture of soap, and, when purified, is one of the ingredients of margarine. Because of its rich yellow colour, palm oil is also used to colour pomades, in the proportion of 1 dram to 1 oz. of other fats.

PALPITATION. In health the action of the heart is not noticed. Under certain circumstances, however, a violent, irregular beating or fluttering may take place, causing distinct and often most unpleasant feelings in the chest. Any strong emotion, such as fear, joy, sorrow, or anger, may bring this about. A very common cause is indigestion, and a heavy or unwholesome meal taken late at night will frequently bring on an attack. Too much tea, coffee, or alcohol, or excessive smoking, are other frequent causes. Palpitation is a symptom of anaemia and some diseases of the heart.

The cause should be ascertained, and if anaemia, indigestion, or any similar condition is present, it should be rectified. When associated with a nervous condition, a healthy, regular life is the best remedy.

During an attack give the patient air, and let him keep still, lying down, but with the head and shoulders well raised on pillows, as palpitation is wont to give a feeling of suffocation. A teaspoonful of sal volatile given in three quarters of a wineglassful of water will help to relieve the patient; or a little brandy or whisky will answer the same purpose. A large mustard plaster applied over the heart will be beneficial. See Heart.

PAMPAS GRASS. With its tall and graceful silvery plumes in autumn, the hardy herbaceous perennial pampas grass, *Cyperium*

argenteum, is a very decorative plant. It is native to South America, and the plume-like flower-heads may reach to 8 feet. The long slender, arching leaves are about 6 feet long, and the plant makes a very large clump within two or three years. On this account it is less suited to the small garden than to a position in a bed on a large lawn, in which circumstances it is seen at its best. The plumes are excellent for winter decoration indoors. They should be

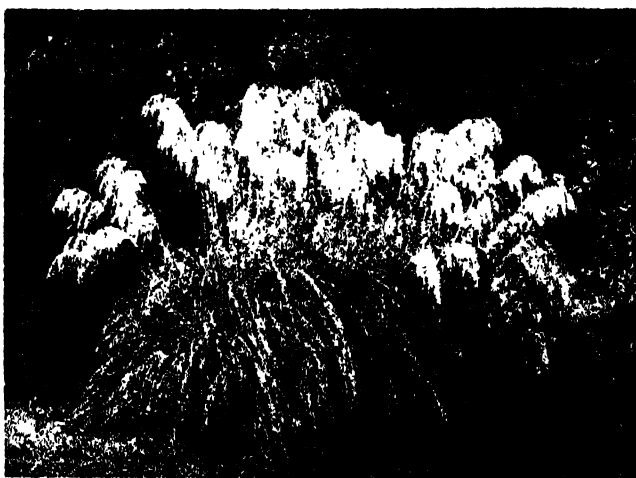


Pancake. Tossing the half-cooked pancake, to fry the other side

ut, with a good length of stem, when they appear to be at their best - and when they are dry. It is propagated by seeds, sown outdoors in summer.

PANADA. The meaning of panada is bread soaked or boiled with milk or water. The term is applied to any thick boiled paste made with flour, butter, and water, or flour and milk, as the basis of a savoury or sweet dish. For example, water, butter, and flour boiled together to form the foundation of choux pastry is called a panada.

To make a bread panada, place the crumb of a new roll or a small portion of the crumb of a loaf in a stewpan with about a teaspoonful of water and a little salt. Boil until it becomes a pulp and add more water, as that which was first put in boils away or is absorbed. When quite soft remove it from the fire and beat in quickly the yolks of 2 or 3 eggs, previously whipped together. Sugar may be added to taste, also flavouring of nutmeg, cinnamon or lemon, and a glass of wine, if approved of, for those who are adults. Milk panada is made much in the same way, but the bread should be boiled with as little water as possible, and when cooked new milk should be added to it, and it should be flavoured and sweetened to taste. The milk should not be allowed quite to boil, but must be very hot. See Cream Bun; Pastry.



Pampas Grass. Tall plume-like flower heads and foliage of a hardy perennial useful for an open space in a large garden

PANAMA HAT. This is a very light, folding hat made from the young leaf of a palm which grows in America. The leaf is finely plaited into hats, which can be rolled up into very small compass, and are prized for their lightness, flexibility and wearing quality.

Though Panama hats seldom or never wear out they become tanned with the sun or soiled, and need periodical cleaning. This can be done at home by rubbing the hat all over with a clean rag soaked in lemon juice, which has a whitening effect, or by using a straw hat cleaning preparation obtainable at a chemist's. See Hat.

PANCAKE: How to Make. The success of this dish depends on the quality of the ingredients employed, fresh eggs and pure milk being essential, and on the thorough beating. The fat also in which the cakes are fried should be white and tasteless and should not have been used previously for any other purpose.

For family use an economical batter will answer the purpose, and to make this, take 1 pint milk, 3 eggs, $\frac{1}{2}$ lb. fine flour, and a salt-spoonful salt. Sift the flour and salt together



Pancakes, a dish widely recognized as the Shrove Tuesday sweet

in a basin, make a well in the centre of the flour and beat in the eggs one by one using only sufficient of the flour to form a thin paste. By degrees beat in $\frac{1}{2}$ of the milk and the remainder of the flour, and continue beating until the whole looks light and frothy. The consistency of the batter while beating should be that of thick cream.

When mixed, add by degrees the milk left over, pour the whole into a jug and put it by for an hour or two giving it an occasional stir.

Before frying, have ready, melted in a small saucepan, some lard or clarified fat. Pour in enough fat to cover the bottom of the pan, let it become smoking hot, then add a thin layer of batter, move pan about until batter spreads evenly, and fry it until the underside is a rich brown. Turn the cake, or turn it with a thin aluminium slice, and fry the other side. To toss the pancake, shake the pan gently until the pancake slips down over the edge of the pan, give pan a sharp, upward flick with the wrist, when cake will

turn completely over into the pan. When brown drain it on a hot dish covered with kitchen paper, dust it with castor sugar, sprinkle it with lemon juice, roll up, and keep hot until the other pancakes are fried.

Castor sugar should be handed round with them, also lemon cut into convenient pieces. To vary the flavour, jam or orange may be substituted for the lemon. A richer batter may be made by increasing the number of eggs to 5, and decreasing the milk by 2 table-spoonfuls for each egg that is added.

Irish pancakes are made with 4 yolks and 2 whites of egg to each $\frac{1}{2}$ pint milk. To make them, melt in the milk $1\frac{1}{2}$ oz. butter and $1\frac{1}{2}$ oz. castor sugar. Whip the eggs well and stir them into the milk, then beat to them by degrees a small teacupful of flour. Fry these pancakes without turning them, and use a very thin layer of batter. They should be piled, when dished, one on top of the other and served with sugar and whipped cream.

French Pancakes. The French pancake differs in method, as the yolks and whites of

the eggs are whipped separately. For a dish of French pancakes, take 5 eggs; separate the yolks and beat them up with 3 oz. castor sugar and the same quantity of very fine sifted flour; add the juice of $\frac{1}{2}$ a lemon and a $\frac{1}{2}$ of the peel grated. By degrees beat in $\frac{1}{2}$ pint of milk. Now fold in lightly the whipped whites of the eggs. Half fill buttered saucers with the mixture. Bake in a quick oven 15-20 min. Turn out on to sugared paper, put a spoonful of jam in middle, and fold.

Yeast pancakes are made from the same mixture as doughnuts and cooked in the same way, but are rolled into small, round, flat cakes about $\frac{1}{2}$ in. thick. Jam is put on one piece and another piece put on top and the two pressed well together before frying.

Savoury Pancakes. For savoury pancakes an ordinary batter may be used, and about 4 oz. of finely chopped cooked game or chicken, well seasoned, should be added just before frying. The batter should be flavoured with parsley, herbs, a shallot or chive chopped fine, 4 oz. meat to 1 pint of batter.

PANCHROMATIC PHOTOGRAPHY

Modern Methods of Obtaining Correct Colour Values

The use of panchromatic plates and films for correct rendering of colours into black and white is shown in this article to be simple and well within the capabilities of the amateur photographer. See Developing, Photography, Portraiture.

Photography with panchromatic plates and films makes it possible to secure the very best representation of coloured subjects in monochrome. The ordinary photographic plate is far more sensitive to rays of blue light than the eye, and also to ultra-violet rays, which the eye does not perceive at all. In addition it is very slightly sensitive to red, which it renders as black (hence the red dark-room lamp) and is not sufficiently sensitive to yellows and greens. The effect given by an ordinary plate is very similar to that gained by looking through dark blue glasses, such as are used by climbers for overcoming the glare from sunlight on expanses of snow.

It is not merely that all objects are seen through the blue glass as one colour or monochrome. The relative brightness of the different colours has changed; bright yellows, reds and greens become dark, while blues and violets, which are usually seen as dark colours, become light. Further, the clouds in the blue sky have disappeared. Orthochromatic plates and films overcome the difficulty to a certain extent, but they give very little help in dealing with the renderings of reds and browns, and are not perfect in their translation of yellows.

Films of the Selochrome and Verichrome type are very highly orthochromatic and are completely satisfactory for many purposes. In conjunction with them filters may be used to improve the colour rendering, but with orthochromatic materials the use of very heavy filters is not advisable.

Panchromatic plates and films give a fairly good representation of coloured subjects even when used alone, but to secure absolutely correct rendering of coloured subjects in mono-

chrome, filters must be used. The filter may be looked upon as a fine adjustment whose function is to make the colour sensitivity curve of the emulsion resemble that of the human eye. But it must not be forgotten that filters can be used for other purposes than to secure correct translation of colours into monochrome. In many cases it may be desired to increase the contrast between adjacent colours, and this can easily be done by choosing a suitable filter. The use of panchromatic plates and films in conjunction with filters gives the photographer complete control over the tonal contrast of the different parts of a coloured subject. For correct representation in mono-

chrome the Ilford Gamma or the Kodak K.3 should be used, but where the lighting conditions are such that the use of one of these filters would mean too long an exposure the Ilford Beta should be used. The best form of light filter is that which consists of dyed gelatine, either used alone or mounted with Canada balsam between glass. Filters in which the glass itself is stained are not usually so satisfactory as it is difficult to get exactly reproducible results in stained glass. The gelatine filters can be bought and used either in the form of gelatine film or as film cemented between plates of thin glass. Ordinary glass or thin plate which has been optically worked may be used. This latter is much more expensive, but with a high-class, long-focus anastigmat lens it is essential since ordinary glass is liable to impair the definition.

The filter is conveniently used in front of the lens in a holder with a spring adaptor to clip over the lens mount.

Filters to be used with Kodak and Ilford Panchromatic materials, with times of exposure (daylight only), subjects and the comparative exposures, are given in page 880.

Exposure factors of Kodak and Ilford filters are average figures and only to be considered correct when used with Kodak and Ilford panchromatic materials respectively. Weather conditions and different forms of artificial light will affect the figures to a considerable extent. Ilford Limited make a filter called the H.W. which, when used with panchromatic materials in half watt light, produces a result similar to the appearance of the subject when seen in daylight.

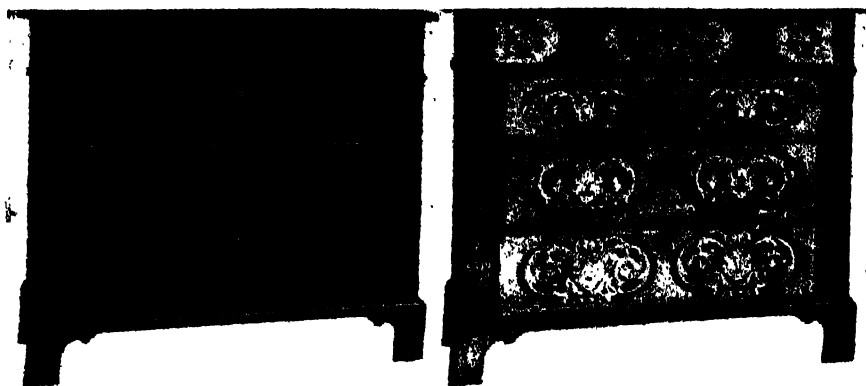
Care should, of course, be taken to see that exposure is reasonably accurate. The amateur photographer will find a reliable exposure meter (q.v.) of great assistance.

There is now a wide range of panchromatic materials, films and plates from which to choose, from slow fine-grain emulsions to specially fast products designed for action photography, for artificial light work, banquet



Panchromatic Photography. These two photographs, taken from precisely the same viewpoint and under similar conditions of lighting, demonstrate the superior tone and detail renderings obtained with a panchromatic film in conjunction with a filter. Left: photo taken on non-colour-sensitive material. Right: results obtained with a panchromatic film. The fine richness of tone and rendering of the sky and clouds seen in the latter are entirely lacking in the former.

Courtesy of Ilford, Ltd.



Panchromatic Photography. Left, inlaid mahogany cabinet photographed on an ordinary plate. Right, the same cabinet photographed on a Kodak Eastman panchromatic film with G colour filter, showing the amount of detail obtained and the superiority in colour rendering.

and theatre photography. Coupled with recent advances in camera design and especially with the wide-aperture lenses now available there are very few places indeed where action pictures cannot be secured.

In portrait work, even of the snapshot

in every case to that of the ordinary plate. The fact that panchromatic plates and films are sensitive to all the colours of the spectrum makes it necessary to use some extra care when handling them in the dark room. The red lamp is quite unsafe and only

the very feeblest of green lights or special quality can be permitted. Safelights for panchromatic materials are made, such as the Ilford G and the G.B., the latter being advised for the fastest films and plates. Even with these safelights, hypersensitive plates may not be more than glimpsed. However, with a little practice it becomes an easy matter to develop in total darkness using the safelight only to illuminate the clock. Under these conditions development is carried out by the time and temperature method.

Filter	Exposure Factor A	Uses	Relative Factor B
K 1	14	Snapshot; minimum exposures	1
K 14	3	Best correction for orthochromatic plates	5-8
Ilford Alpha (a)	14-2	Most ordinary subjects, short exposures	3-4
K 2, Ilford Beta (B)	3	General use, landscape, portrait, snapshots with fast lenses	8-10
K 3	4	Correct renderings of difficult subjects	
Ilford Gamma (γ)	4	Correct renderings, all colours, coloured pictures and objects	
Kodak G (orange) Ilford Avio	6	Telephotography, to overcome haze in landscapes	2-3
Kodak A (red)	12	Furniture, etc. with reds and yellows	
Kodak F (deep red)	24	Great contrast for deep reds and browns in old furniture	
Ilford Delta (δ)	4	For strong rendering of clouds	

(A) Exposure factor for panchromatic plates or films.
(B) Relative exposure factor for orthochromatic plates or films.

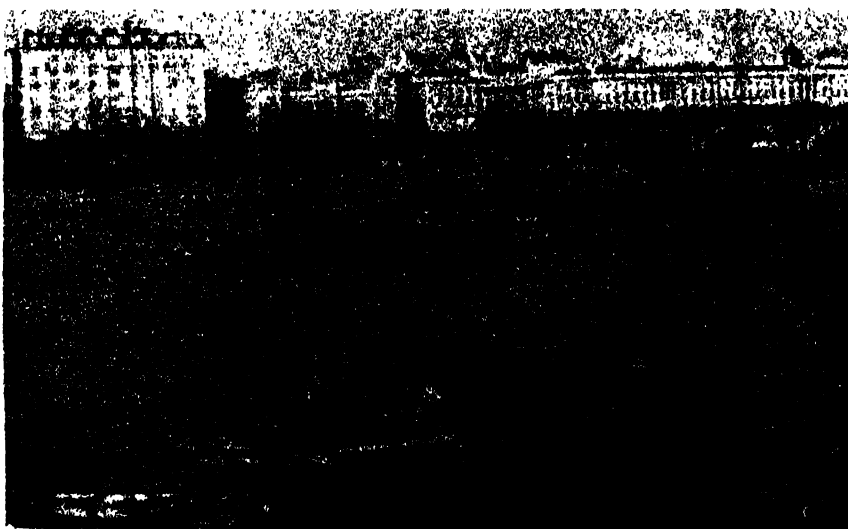
For Kodak Verichrome film the exposure factors are as follows:
K 1 = 2, K 14 = 4, K 2 = 8

Ilford Limited manufacture three filters particularly suitable for orthochromatic materials, viz: Chromatic I, II, & III.



variety, and with portraits taken out of doors, very great improvements will be obtained by the use of panchromatic films. Almost all complexions have small patches of hardly visible red, which the ordinary plate reproduces as black blotches. It also accentuates wrinkles and freckles, and red or golden hair comes out much too dark. A panchromatic plate or film with a K 14 or Alpha filter overcomes these difficulties without making it necessary to retouch the negative. In landscape work the ordinary plate renders the sky as a harsh solid white, since it is unduly sensitive to the blue of the sky, so that the white clouds are altogether lost, that portion of the negative receiving relatively greater exposure than the foreground portion. With panchromatic plates and films it is possible to get clouds and landscape on the same negative, as the filter keeps back a portion of the blue rays. Moreover, a landscape usually contains many different tones of greens and yellows which ordinary plates reproduce in monochrome.

Striking examples of the improvements achieved by panchromatic films and plates are shown in the illustrations. The panchromatic rendering is enormously superior



Above, photograph taken on a plate with ordinary uncorrected emulsion on a sunny but misty November day. Detail in the distance is badly rendered and the sky is an unnatural hard white. Below, the same scene taken on a Kodak Eastman panchromatic film with a Kodak G filter. Panchromatic films and plates are particularly valuable in landscape photography.

PANCRATIUM. This is the name of a genus of vigorous bulbs of which the chief favourite is *Panocratum fragrans*. It bears umbels or bunches of white sweet-scented flowers and must be grown in a hothouse in a compost of loam, peat, and sand. During the period when the bulbs are at rest little water is needed, but in the growing season the soil must be kept thoroughly moist. *Panocratum illyricum* is hardy in sheltered places in mild districts.

PANCREAS. The pancreas performs a double duty. It supplies a juice which helps to digest food in the stomach, and also an essential hormone for the blood. Owing to its deep, sheltered position, injuries of the pancreas are rare. Diseases are rare but grave. Acute haemorrhagic pancreatitis is sometimes fatal, as is also cancer of the pancreas. Among the causes of chronic pancreatitis are alcoholism and arterio-sclerosis.

PANEL: In Woodwork. The term panel is used for an area recessed below the general surface. Usually the panel is a piece of wood separate from the framework enclosing it, and in the majority of cases it is thinner.

Roughly speaking, the object of the panel is threefold. It is the result of an effort to obtain lightness in construction without detracting from the strength of the work; it reduces the risk of warping and splitting, and it effects an economy in material. Fig. 1 shows a panel of 1-in. material surrounded by a framework of 1-in. stuff. The requisite strength is maintained by the grain of the top and bottom rails running at right angles to that of the panel, and at the same time preventing it from twisting. Fig. 2 shows how the panel is held in the framework within a groove without being fixed, so that it is free to shrink independently of the frame, thus lessening the risk of splitting. If the panel in Fig. 1 had been glued in, or otherwise rigidly fixed to the frame, the pull caused by its shrinkage, as shown by the arrows, would be opposed by the fixed resistance of the top and bottom rails, and this would result in splitting.

Where a panel is not grooved into the frame, but kept in position by two mouldings, as in Fig. 3, the nails holding the mouldings must be driven into the frame as shown, and must not pass through the panel. When it is desired to groove a panel of more than $\frac{3}{4}$ in. thick into a framework of 1-in. stuff, the panel should be bevelled off at the edges, as in Fig. 2. The panel should fit hand tight in the groove, and the best method of testing it is to groove a spare piece of wood, called a mullet (Fig. 4), with the same size of groove as that to be worked on the frame, and test this round the edge of the panel.

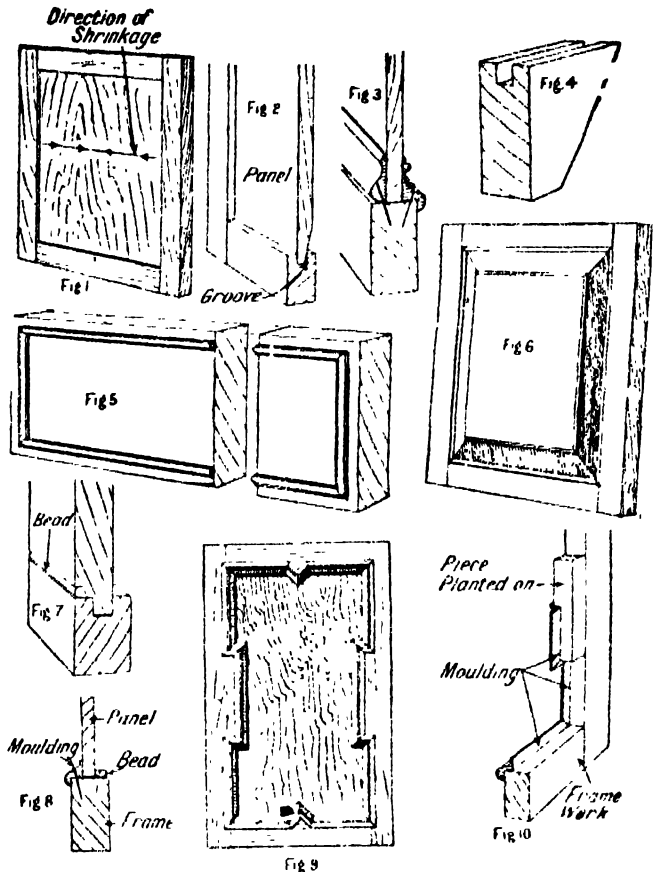
False and Raised Panels. A false form of panel is shown in Fig. 5, a moulding being mitred round a solid piece of wood to give a panelled effect. Fig. 6 shows a particularly effective type known as a raised panel. The stuff is first thickened, and the width of the bevelled portion and its inner and outer depths gauged round. It is then rebated down to the shallowest gauge line, working across the grain first, and then bevelled down to the lower gauge line, care being taken to prevent the corners from chipping out; the small hollow moulding is worked last. First thickness the stuff carefully, or the bevelling will result in the edges being uneven in thickness.

All the stuff used for the panel should be as clean as possible, and when the work is to be polished should, wherever possible, be of one piece. Very wide panels are jointed up in their width, using either dowels or a tongued and grooved joint when the wood is sufficiently thick to take them.

Another type of panel is that used when conditions require that the panel shall finish flush with the framework, as in certain large

table tops. The face side is rebated, forming a tongue which fits into the groove in the frame, as in Fig. 7. A good plan is to run a bead along the rebated edge of the panel with the grain as shown. The reason this is done is that in the event of the panel shrinking the open joint will not be so noticeable. The best method of securing a panel not grooved into the framework is to pin a bead in the rebate at the back, as in Fig. 8. This not only leaves it quite free to shrink independently, but the panel can be removed easily by raising the beads. Fig. 9 is a decorative panel for use in oak work; as in the case of the other panels, the mouldings are attached to the framework and not to the panel. Fig. 10 shows the main construction, consisting of a plain square edged frame mortised together and having pieces planted on to the edge wherever the break-forward parts occur. A rebated moulding is mitred round as shown, and the panel is then cut to a corresponding shape and fastened in with

edge, a piece of timber with a groove to hold the strip makes for easier planing. When planing the surface of panels, a panel board of a mullet, a small piece of wood that is should be used; this is a piece of wide, smooth wood with a butting strip or stop at one end, consequently if the edges of the panels fit the mullet, they will fit into their proper grooves. bench. See Upboard; Door; Hall; When planing thin strips, particularly on the Marquetry.



Panel in Woodwork. Fig. 1. Simple type. Fig. 2. Section of same, showing how it is held by groove in framework. Fig. 3. Section of panel held between two mouldings. Fig. 4. Mullet. Fig. 5. False panel with mitred moulding. Fig. 6. Raised panel. Fig. 7. Section through panel fitting flush with framework. Fig. 8. Section of panel fixed between moulding and bead. Fig. 9. Oak panel with applied moulding. Fig. 10. Diagram giving details.

PANELLING: ANTIQUE AND MODERN WORK

A Beautiful Form of Household Decoration

Practical advice is given here about the actual performance of the work. Attention may be drawn to such articles as Ceiling; Chimney Piece; Decoration; Dining Room; Hall; House; Library; also Georgian Style; Jacobean Style; Linenfold; Oak; Paperhanging.

Panelling may be described as covering the surface of a wall, door, ceiling, or other part of a building with panels, which are raised or sunk, compartments, generally framed at the edges. The materials used are wood, stone, and plaster.

Panelled walls in the interiors of houses in England date from medieval times and in crude form appeared before tapestry began to be used. Panelling was not unknown to the Normans, but it was during the period of Gothic architecture known as Early English that it began to develop in this country. In work of the 12th and 13th centuries the square panels were ornamented and the larger ones were often deeply recessed, so as to form niches with trefoil heads and sometimes with canopies.

History of Panelling. In the Decorated or second period of English Gothic architecture, the enrichments of the panel became more elaborate, and the latter were often filled with shields, foliage, or figures. The use of panels became very common in the third period, known as Perpendicular, when the walls of

the buildings of importance were frequently entirely covered with long, short, or square panels, the square ones being frequently filled with almost every kind of ornament. Most of the existing examples, however, are not earlier than the 17th century, though Tudor panelling, often with characteristic linenfold ornamentation, is still seen. All through the 18th century panelling was employed in comparatively small houses, and its use was not seriously interfered with or lessened until the introduction of cheap wallpaper.

In Elizabethan and Jacobean work the small wood panel appeared sometimes with an inlay of coloured wood, and with gradually increasing elaboration of the moulding of its frame. The plaster panels of the ceilings of the time became correspondingly rich in decoration.

A typical room showing the fine workmanship in English panelling of the early 17th century would include the following elements. The overmantel consists of the royal arms carved in very high relief and having on either



Panelling. Fig. 1. Pine panelling in a Georgian room of about 1785. Note the simple, shallow panels, the restrained use of rich carving, the decorative ceiling cornices and the niche shelves.

By permission of the Director, Victoria & Albert Museum, South Kensington.

side a niche between two partially fluted columns; the whole rests on a long shell, decorated with flat strapwork ornament, and supported by two terminal figures. The panelling is divided at intervals by pilasters with flat strapwork. The cornice is enriched with a dentil moulding and bracket, and the frieze beneath has similar strapwork ornament.

After the middle of the 17th century the size of these wood panels was greatly increased, and towards 1700 they developed the long oblong of the Palladian style with bolder mouldings. In the 18th century the taste of Robert Adam reduced the size of the panel to more reasonable proportions, especially in its treatment of doors. About the same time the moulding was simplified, and it became the fashion to paint panels in white or cream. Later developments are seen in Fig. 1.

There is no form of wall treatment which has so satisfactory a relationship to the structure of the building as panelling. It should be designed to fit in with chimney breast, door, and windows, forming altogether a co-ordinated scheme. The careful design of panelling can correct an unsatisfactorily proportioned room, modifying its apparent length, height, or width. Panelling is in itself a decoration, and although it is a background to furniture, it essentially restricts freedom of applied ornamentation to the walls in the form of pictures and other hanging details.

Modern Panelling. For modern rooms which are very often too high for their length, it is usually satisfactory to stop the panelling at about 7 or 8 m. from the ceiling. This leaves a frieze above, between the upper mouldings of the panelling and the cornice. It presents an opportunity for introducing a valuable decorative feature which may be treated in numberless ways. Should the panelling be dark brown, however, it is wise to allow the frieze and ceiling to be cream or a very pale buff or apricot shade to preserve a large area for reflecting light into the room, for one of the drawbacks of dark panelling is its absorption of light. It is not a good reflecting surface. On the other hand, a room may be treated with deal or pine in panel formation from skirting to cornice, the whole wall being

then painted or stippled any desired tint, ivory, pale or deep green, or grey being common, and the moulding picked out with a lighter or deeper colour, or with gold or silver leaf.

Painted panelling also looks well with modern furniture when the colour is stippled and shaded to deeper tones towards the

mouldings. Grained effects may be used to imitate cedar, mountain ash, or walnut. Beautiful and dignified panelling for hall and staircase or dining room is carried out in the grained effects enriched with judiciously applied gold ornaments and mouldings.

British Columbia pine is used for modern panelling either with a waxed satin finish which lends a tawny shade to the figuring of the wood, or stained and finished in brown. Another British Empire timber employed is Canadian birch, with a silver grey finish which looks well when inlaid with a cross banding of black to divide the panels. The rapid progress made in the manufacture of plywood brings panelling effects within reach of many more people. The most beautiful woods, by means of improved veneering methods, are obtainable at a fraction of the cost of the old style panelling. Any kind of classical panelling can be fitted in an existing house at a reasonable price.

A point to be taken into consideration with regard to this form of mural decoration by those who are building or reconstructing houses is the fact that far fewer accessories and pieces will be required in a panelled room than in one that is painted or papered. Many ornaments or pictures simply kill the design of a well panelled room. When building, panelling lends itself naturally to the inclusion in the dining or living-room of built-in furniture such as cupboards, bookcases, niches with shelves and sideboards. A great saving in buying such or equivalent pieces of furniture is therefore effected, and a uniform result obtained which makes a harmonious setting for beautiful furnishing fabrics in styles selected to co-ordinate with the panelling of the room.

An additional point in favour of natural timber panelling is that such decoration does not involve the recurring expense of periodical renewal, whereas the sum spent on repainting and papering the walls—for instance—of a



Fig. 2. Example of English old oak panelling, showing the characteristic small size of the panels.

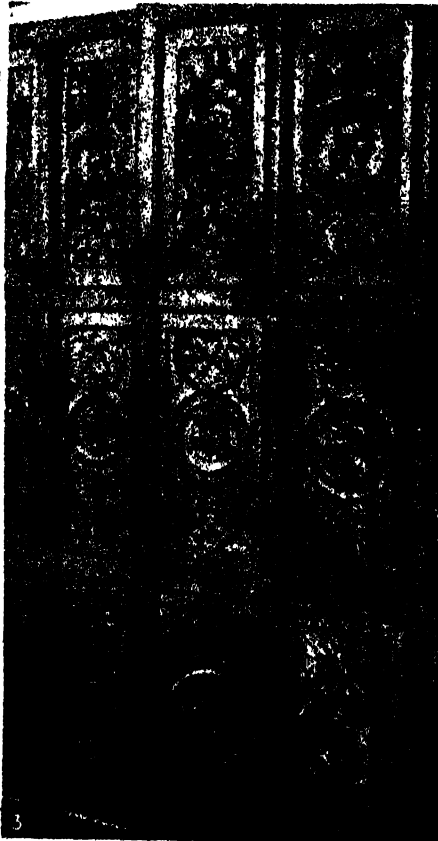


Fig. 3. Fine example of early English work in heavily carved panelling.

By permission of the Director, Victoria & Albert Museum, South Kensington.

hall and staircase in one's own house would be considerable over a period of years.

The development of modern wallpaper decoration has placed at the disposal of the builder an almost infinite variety of imitation panelled walls. Many patent materials are employed in the design of papers which closely reproduce the effect of wood. The danger of this imitation panelling is its facility of application, for under inept or careless handling it can easily be made to look as though its features do not fit the room, and the essence of the decorative value of panelling lies in its close relationship to existing structural features. The greatest care is necessary to select imitation panelling of such proportions of moulding, rail and panel as suit the size, shape and style of the room to be treated.

Repairs to Panelling. The framing of panelled work is not so liable to faults as the panels themselves, which, owing to excessive shrinkage or decay, sometimes require attention. Those portions which, owing to decay, are in need of repair, should be cut out as far as possible at an oblique angle, and new material, matching in grain and colour, carefully fitted and glued into position. The removal of a defective panel is not difficult if the framing is moulded on the edges, the method being to cut away the moulding surrounding the panel in the form of a rebate. After the panel has been repaired or renewed, the original moulding is reproduced in the form of beading and glued and brad ded into position.

For plain work, apart from taking the whole of the job down so as to work from the rear, the only method of dealing with a defective panel is to cut away sufficient wood from stiles and rails to allow of its removal. In this case the rebates should be very carefully traced up, using a straight edge, so that new pieces, matching in grain and colour, can be glued in when the panel has been fitted in.

Panelling a Room. Panelling can be done by the home worker in two chief ways. He can use grooved framing, or may employ a perfectly plain framework and secure the panels with suitable beading, the latter being much the simpler method. Although oak is generally used for the whole of the work, a good effect is obtained by using deal for the framework. This can be stained to a suitable colour, and the fitted panels cut from oak plywood. The use of plywood is preferable to thin boards, as the beauty of the grain is retained and it is not liable to shrink. Ready machined oak or other hardwood can be obtained which is grooved for panelling. Some has a $\frac{3}{8}$ in. groove for use with plywood.

In the older types of panelling the panels were small, and two characteristic examples are illustrated in Figs. 1 and 2. Fig. 3 is a close-up of a finely carved example of early English oak panels, which shows the possibilities in this direction.

The preliminary work is much the same in all the various methods adopted, and consists in working on the wall a series of vertical and horizontal strips of wood known as rough grounds. The grounds should be approximately 2 in. wide and about $\frac{1}{2}$ in. thick. The purpose is to produce a fair surface on which to work the panelling and fix it to the wall. The room should be planned out and working drawings prepared, showing where each panel is to go, the grounds then being fixed accordingly. In general it will be necessary to have grounds at every corner, on every angle, one almost at the top of the wall, and one close to the bottom,

where the skirting board is located. This latter, if only a plain board, should be removed, and can be replaced later.

Only a part of the wall will be panelled in some cases, as, for example, a dado or a $\frac{1}{2}$ in. panel taken only to the frieze or picture rail. The ground having been prepared, the panels are then applied.

A simple way of simulating real panelling, or procuring a panelled effect, is by the use of plywood, or alternatively one of the modern building or panel boards. If this latter is used as a groundwork the whole wall surface may be covered, and the panelled effect obtained by employing beads or moulded strips of wood properly jointed at all intersections. These strips will be simply nailed to the ground, with small oval beads, or panel pins, punched below the surface of the strips, and the holes stopped with putty coloured to suit the finishing colour. If 3 ply boards are used as the ground work they may be attached similarly to rough grounds, and Fig. 4 shows this operation in progress on a ceiling.

Framed Panelling. The foregoing method, although it produces a panelled effect, cannot

covered by another panel moulding or plaster. Ceilings may be panelled on the same principle as the walls, or by framing the work in sections. Often a ceiling is panelled in fibrous plaster moulds or enrichments, which are worked on to it while the ceiling is being made. Good results are obtained by the use of strips of rough-hewn oak about 1 to 4 in. wide and about $\frac{1}{2}$ in. thick which may be placed on the plaster ceiling, to represent the exposed edges of the joists, when carefully done, it gives an air of spaciousness to the room, as shown in Fig. 5.

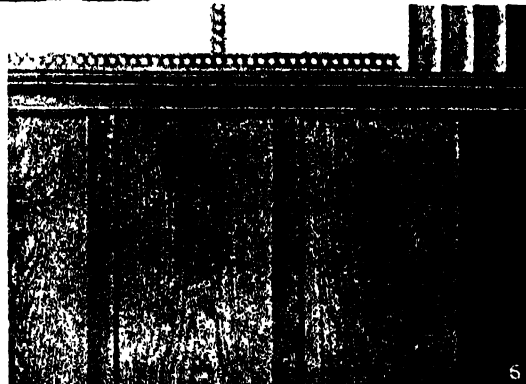
Imitation Oak Panelling. Where it is desired to give a panelled effect in a simple and inexpensive fashion, an oak grained paper may be employed. The whole surface is first covered with the special paper, applied in the same way as ordinary wallpaper, and the panels then formed by pasting on strips of moulded and grained paper. The skirting board should be stained to a dark brown colour, and simply finished with a plain chamfered edge. The frieze or picture moulding is treated in a similar way. If the worker cares to go to the trouble of forming the panels of thin strips of deal, planed on and stained to match the grained paper, the result, as will be evident from Fig. 6, is hardly distinguishable from real panelling.

Various methods of employing embossed and other panels with wallpaper are described in the articles on Paperhanging and Wallpaper.

PANEL PIN. The fine straight nail known as a panel pin is used in cabinet work and other woodworking processes. It has a flat head with a tapered portion that slides into the shank of the nail. For many domestic purposes a panel pin 1 in. long and 16 gauge can very well take the place of a larger nail. See Nail.

PANEL WARMING. This is the name given to a method of central heating in which the heating units (hot-water pipe coils or electrically heated elements) are embedded in the ceiling and sometimes in the walls. Claims made for this method of warming are that the heat is distributed almost solely by radiation at comparatively low temperatures, being projected from the warmed surface of the ceiling, that there is an absence of the stuffy condition sometimes associated with convection warming systems, and that a reasonable amount of air movement for ventilating the apartment is possible without any great heat losses. See Central Heating.

PANICUM. Of this ornamental grass there are both hardy and greenhouse kinds. Panicum variegatum has green and white leaves, and is a popular greenhouse plant, being useful as an edging for the



Panelling. Fig. 4. Applying the ceiling boards before panelling with strips of wood. Fig. 5. Panelling with rough-hewn oak strips on a plaster ceiling. Fig. 6. Wall hung with oak-grained paper and panelled with stained deal strips.



Panicon. Green and white decorative leaves of the greenhouse plant *P. variegatum*. Courtesy of Amateur Gardening

staging. It is easily increased by division. *Panicum miliaceum* is the millet. Some of the best hardy kinds are phaeum and virgatum.

PANSY. This is a popular hardy, summer-flowering perennial of which there are many fine strains and named varieties. *Viola*



Pansy blooms of mixed colours

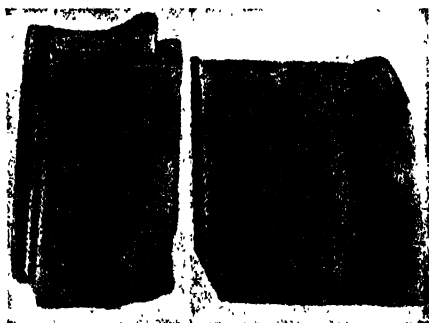
tricolor, or heartsease, is the chief species or wild type from which the pansy has been developed during many years. Bedding pansies are commonly raised from seeds sown in boxes of fine soil in a frame in May or June, the seedlings being planted on a reserve border when large enough and finally set out in autumn where they are to bloom the following summer. Named varieties are propagated by cuttings made from flowerless shoots in July-August, and inserted in sandy

soil in a frame. Planting out of doors is done in autumn or spring.

Named varieties of show and fancy pansies grown for exhibition are given special cultivation, and the number of blooms on each plant is limited. Pansies flourish best in deep loamy soil in slight shade, but they will grow in ordinary well-tilled soil and flower throughout many weeks if care is taken to remove the faded blooms.

PANTHER LILY. This is the popular name of *Lilium pardalinum*, one of the showiest lilies for the garden. It grows 5 ft. high and bears very handsome flowers, orange flushed with red and marked with dark spots.

PANTILE. This is the name given to a form of clay tile used for roof-covering. It is usually hollow or semicircular in cross section. Some are not curved in this way, as, for example, the Roman pantile. The pantile is one of the cheapest forms of tiling. It is a thick tile, dark red in colour, and about 155 tiles will be found necessary to cover a roof surface of 100 sq. ft. or a space measuring 10 by 10 ft. Some pantiles



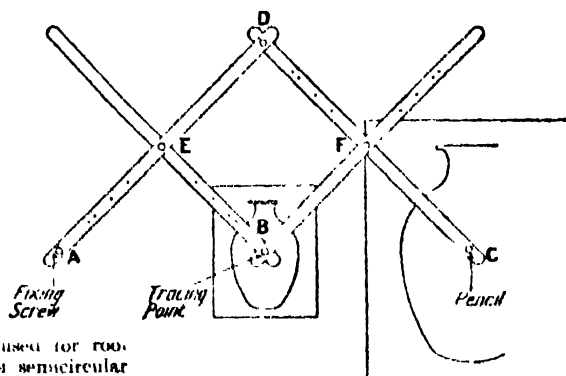
Pantile. Two types of this roof covering: left, interlocking form; right, Roman pantile

are made of asbestos cement and other materials, and these are light in weight, while retaining the appearance and quality of the old-fashioned clay tile. See *House, Roof; Tile*.

PANTOGRAPH: For Copying Drawings. This is a simple piece of apparatus made of 4 narrow strips of wood drilled with holes at definite positions and pivoted together. It is used for copying drawings, maps, etc., to an enlarged or reduced scale. It is provided with a screw at one end for fixing to the drawing board, a pointer for following the lines of the original drawing, and a pencil for tracing the new drawing. It is simple in action, does its work accurately, and saves a great amount of time and labour.

In the diagram above the pantograph is set for enlarging to twice the original size. The point A is fixed to the board; at B is a pointer which is moved along the lines of the original drawing, and the pencil point at C traces the lines on the drawing paper. The joint at

D is fixed, but those at E and F are adjustable, and are altered to suit the proportions of the required enlargement. For reducing, the tracing point is placed at C, and the pencil transferred to B. By making



Pantograph. Instrument set for enlarging drawing of vase to twice its original size. See text

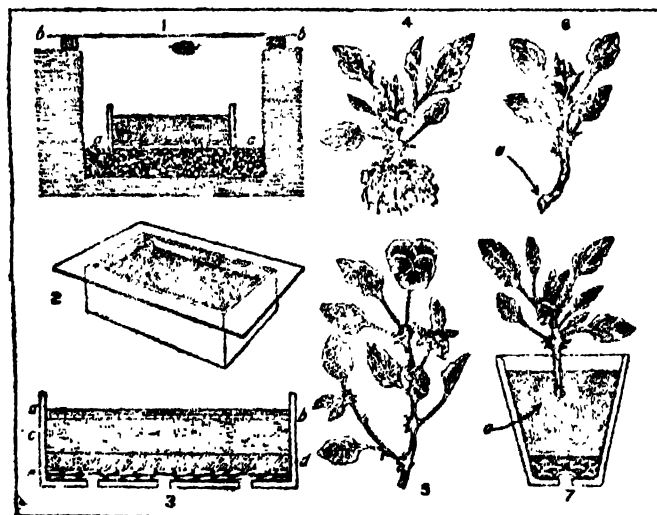
B the fixed point, with the pointer and pencil at the opposite points A and C, a drawing can be reproduced the same size as the original.

To fit up the instrument, the fixed pivot at A is secured to the left hand side of a drawing board, and the original drawing is pinned so that the tracing point is about the centre of the drawing when the arms of the pantograph are parallel. The sheet of drawing paper is pinned down centrally under the pencil point and set square with the drawing. Providing that the point of the pencil is sharp, and the correct distance from the paper, there is no need to watch it, attention being devoted to moving the tracing point on the drawing to be copied. If the original drawing is very small, great care must be taken to move the pointer accurately, as any mistake will be doubled in the resulting enlargement.

PANTRY. In any house a pantry is an aid to service if it is fitted with a sink and cupboards, and adjacent to the dining room. Washing up of silver, glass and table china can be done there, and the articles put away on their proper shelves. Dessert, wines or spirits, cakes for afternoon tea, and supplies of tea and coffee can be kept in a cupboard in the pantry, also the requisites for their service. The pantry is also a place where flowers can be arranged, and the silver and ornamental pieces of brass cleaned. Where the kitchen is of the compact labour-saving type, a pantry is sometimes built instead of a scullery. The tendency in house design now is to combine the larder and pantry; in most suburban houses the pantry is primarily a food-store, with a kitchenette fulfilling the function of pantry. It is a good plan to have the refrigerator in the pantry.

The sink should be placed near a window, with a draining board on either side. An enclosed dresser, where the best china and glass can be kept on the upper shelves, and silver in baize-lined drawers below, is a convenient fitment. Shelves for vases and trays, a small cupboard for jam, pickles, sauces, and condiments in use, and for supplies from which the dishes and containers can be replenished, are also desirable, together with a small table, or a table shelf which can be folded down when not in use.

The most satisfactory plan is to locate the pantry between the dining room and kitchen, as shown in our illustration of a typical labour-saving arrangement in a medium house. There are communicating doors and also a service hatch. Used plates and dishes can be placed on the folding shelf, which when closed conceals the hatch. The china is transferred directly from the shelf to the sink, which has



Pansy. 1. Seed raising in pit shelter: a, cinders; b, glass. 2. Alternative method. 3. Seed preparation: a, fine soil; b, seeds; c, soil; d, leaves; e, drainage. 4. Good type of seedling. 5. Bad cutting. 6. Sturdy cutting with heel (a). 7. Potting a cutting: a, sand



Pantry. Labour-saving pantry situated between kitchen and dining room. Used plates and dishes can be placed on the folding shelf which, when closed, conceals the service hatch.

a constant hot water supply. By such an arrangement the process of washing up is simplified.

A pantry sink should be glazed white, straight-sided and deep. The outlet should be closed with a plug so that the sink itself can be used for washing up. A papier mâché bowl should be kept to hand for fragile china and good glass.

Where there is choice in the matter electric light should be preferred to any other illuminant. As the pantry is intended for storage of food and the larder may be situated here, the greatest care must be taken to keep it well ventilated. This can be assisted by fitting an air brick or ventilation shaft in the bottom of the wall, just above floor level. To prevent the entry of flies, the window opening can be covered with perforated zinc or wire gauze, or a clean muslin curtain can be fixed in a small frame to be inserted in the opening. See Dining Room; Kitchen; Larder; Service Hatch; Sink.

PAP AVER. This is the botanical name of the poppy, a race of showy plants including annual, biennial, and perennial species. The first class contains the opium poppy and the popular Shirley strain, whilst the biennials and perennials include those important garden favourites the Oriental and Iceland poppies respectively. See Poppy.

PAP BOAT. This name is given to a little bowl, good examples of which are sought by collectors.



Pap Boat. Example of this shallow antique silver bowl, period of George III. Chapple & Mantell.

They were first made in England early in the 17th century. Usually of silver, they are about 4 in. long. Some are pinched in the middle in order to afford a holding grip.

PAPER. Its Uses. Face papers for decorative purposes are sold in packets in the form of doilies and dish papers. Both white and tinted papers of light quality are made into frills for decorating cutlets, hams, or pie-dishes; others are specially made for sweet cases, dish collars, and tray cloths. Crinkled papers, either quite plain or with designs in colour, are employed for making paper-serviettes. Coloured papers are obtainable for lining cupboard shelves and chests of drawers.

Semi-transparent grease-proof paper is used for lining cake tins and for other similar culinary purposes.

Kitchen wrapping papers of cheap quality, white or brown, are sold mostly in double crown size, 20 in. by 30 in., or demy, 17½ in. by 22½ in. Toilet rolls of thin manilla or other paper are generally retailed in 12-oz. rolls. Blotting paper is usually supplied for home use in pads, but may be purchased in demy sheets of various colours. Tissue paper, sold in sheets or in under double crown size, is used for wrapping

plate, packing dresses, polishing mirrors, cleaning lamp glasses, wrapping up flowers, etc.

Papers impregnated with chemicals are used for polishing spectacle lens, and for imparting

a film to prevent misting. Tissue paper handkerchiefs can be bought in packets of 25, 50, or 100, and are more hygienic than cloth ones, specially when the user suffers from a cold in the head, as they can be destroyed immediately after use. Toilet tissues are used for removing face cream and make-up.

For firelighting, pieces of twisted ordinary paper can be used instead of firewood. These are made about an inch thick and can be bent or doubled up, to fit the grate. When properly twisted they burn slowly, giving out a strong heat.

Paper, especially coloured crepe paper, can be used for decorative purposes in several ways. Artificial flowers and Christmas decorations can be made from it. See Artificial Flowers; Candleshade; Christmas; Note paper; Papier Mâché.

PAPER BAG COOKERY. The main principle of this system of cooking is to enclose the food in a greaseproof, airtight paper bag and place it on the wire grid of an oven, or on a trivet. It is an economical method of cooking, as less heat is required in the oven than when cooking is done by the more usual means. The greaseproof paper has the effect also of retaining all the natural juices in the food, thus rendering the food more nourishing and digestible.

Special bags are sold for this purpose. A bag that is at all damaged should not be used. Before the food is put into the bag, they should be well greased inside with butter, lard, or olive oil. Any projecting edges of the food, meat, or fish bones that might tear the bag, should be removed. Small fish, fillets of fish, cutlets, chops, and steaks can be cooked in the oven in this way. Brush over the fish or meat with dripping, or butter, season it with pepper and salt, and slip it into the well-greased paper bags. Place these on the grid of the oven, which should be hot, turn down the heat after 5 min., and in 15 to 20 min. the food will be cooked.

PAPERHANGING FOR WALLS AND CEILINGS

Practical Instructions on the Re-decoration of Rooms

This article belongs to the important group that deal with the decoration of the house, among these being Colour; Dado; Decoration; Distemper; Enamel; Paint; Panelling; Wallpaper. See also the articles on the various rooms, e.g. Bathroom; Bedroom; Dining Room; Kitchen.

Paperhanging is the process of covering the surface of wall or ceiling with paper manufactured for the purpose, applied with the aid of a suitable adhesive. The tools necessary are a large pair of scissors with blades about 7 in. long, a large paste brush, a brush with long bristles closely set into the back, which is also its handle, used for smoothing the paper when putting it on the wall, a roller about 8 in. long covered with thick felt, another 6 in. wide for rolling edges; a stripping knife and a plumb bob and line.

A table is required on which to paste the lengths of paper, a width of 24 in. is necessary and the length should be 6 ft. A couple of light planks hinged or fastened together side by side makes a good table. These must be supported at a height of about 2 ft. 6 in., preferably by trestles, although boxes or other supports can be utilized.

Wallpapers are produced to accord with the purpose of every type of room and in a great number of different qualities. Papers with well distributed patterns show joints least when hung, and if of medium weight are among the easiest to apply. Quite plain papers require greater skill to hang successfully. Between these two types there is a large variety of mottled, grained, stippled and indefinitely patterned papers, which give excellent results and are easy to handle.

Wallpapers of light and nondescript tints (cream, fawn, etc.) can be used in any room,

but bright colours and deep shades have definite character and use. Bright yellow and orange can be employed for hall and staircase, amber, maize and golden tints for sitting room, lounge or dining room. Browns and greens are also in favour for dining rooms. Mottled effects resembling vellum and old parchment are very decorative.

Choosing Paper. When selecting paper the purpose or use of the room should be given first consideration, and the aspect is of scarcely less importance. Warm tints, such as yellow, brown, and shades of red are helpful in north and east rooms. Blue and grey should be reserved for rooms with southerly aspects. Special types of paper are made for particular purposes. White grounds with "satinette" prints are made for ceilings, also embossed papers. Some of these with definitely geometrical patterns are also useful for dado decoration. Bathroom papers should be either varnished or of the "sanitary" type. The latter is printed with an oil medium, so that the colour is unaffected by moisture. The most satisfactory treatment for bathroom walls is, however, to hang an unvarnished paper and apply the varnish after it is hung. By so doing the joints of the paper are sealed. Two coats of size must be given before varnishing.

Quantity of Paper Needed. To estimate the quantity required to cover the walls of a room, add the total length of the room to the

width, multiply by twice the height, and divide this total by the area of one piece or roll of paper in square feet, which may be taken as approximately 60 sq. ft. The result is the number of pieces required. When measuring the room, include the window openings, fireplace, and doors, as in practice it is found that by including them in the whole area it allows for cutting and waste in the paper. The following table gives the number of pieces required for a room, provided the height to cornice and total feet run in inches round the walls are known.

Feet run including Cornice and Windows	Height in feet from Cornice to Skirting										
	7½	8	8½	9	9½	10	10½	11	11½	12	12½
28	4	4	4	4	4	5	5	5	5	5	5
32	4	4	4	5	5	5	5	6	6	6	6
36	5	5	5	5	6	6	6	6	7	7	7
40	5	5	6	6	6	7	7	7	7	8	8
44	6	6	6	7	7	7	8	8	8	8	9
48	6	6	7	7	7	8	8	8	9	9	9
52	7	7	7	8	8	9	9	9	9	10	10
56	7	8	8	8	9	9	10	10	10	10	11
60	8	8	8	9	9	10	10	11	11	11	11
64	8	9	9	9	10	10	11	11	12	12	12
68	9	9	9	10	10	11	11	12	12	13	13
72	9	10	10	11	11	12	12	13	13	14	14
76	9	10	10	11	12	12	13	13	14	14	15
80	10	11	11	12	12	13	14	14	15	15	16
84	10	11	12	12	13	14	14	15	16	16	16
88	11	12	12	13	13	14	15	15	16	17	17
92	11	12	13	13	14	15	15	16	17	17	18
96	12	13	13	14	15	15	16	17	18	18	19
100	12	13	14	14	15	16	17	18	19	19	20

This scale is for papers of English measurements (rolls 21 in. by 11½ yds. approximately). For papers 7½ yds. long and 28 in. wide, add to the above table in the proportion of 1 in 7.

In dealing with ceilings, multiply length by breadth in feet and divide by 54. The result will give approximately the number of pieces required.

Stripping Old Paper. Old paper should be stripped before new is hung, not only for hygienic reasons, but also because paste perishes in the course of time and the application of new paper is likely to raise blisters which cannot be smoothed out. If, for some reason, old paper cannot be removed, all edges and angles of walls should be carefully examined and loose places patted down. When dry, a coat of size should be given over the whole surface. It is advisable to obtain the best powder size and mix according to the printed instructions. Size should be diluted so that when cold it will set in a weak jelly. It is better to apply two coats of weak size than one strong coat.

Old paper is removed by saturation with water until it has penetrated to the plaster. The stripping knife is then used to release the paper, and must be handled so that the point does not damage the plaster. The vigorous use of the knife is unnecessary. It is better to apply more water. A large duster brush is best for wetting the paper. Commence at the top of the wall, working right and left as far as the arm can reach, and proceed downward. A sponge wrung out in clean water must be used frequently to absorb the water which will collect at the skirting. After stripping, the wall should be sponged with clean water, and when dry a coat of size should be given.

Papering New Walls. New walls are sometimes distempered and left for a while before papering on account of the risk of detriment to the colours if papered before the walls are properly matured. If, however, the risk of discoloration is accepted it is wise to hang inexpensive papers at first, choosing those in which shades of maize and yellow predominate, and avoiding blue and green as much as possible. Light grounds with well covered patterns are very serviceable.

If possible a "lining" paper should be hung as a preparatory whenever good quality

papers are to be used. Lining gives a uniform surface which enables good joins in the finished work to be made more easily. Lining paper is of distinct value on outside walls, especially if their surface is of hard and non-absorbent nature. On such walls in cold and damp weather moisture readily condenses inside and is frequently the cause of paper loosening at the edges.

Before hanging, wallpaper needs to be trimmed. It is sometimes possible to have this done by machine when purchased, but it is not difficult to accomplish by hand. Take a low seat and, with the legs extended, unroll a piece of paper, holding the end in the left hand and letting the roll rest on the feet. Operate the scissors with the right hand whilst the left rolls up the paper on the lap. The paper must be trimmed to the edge of the pattern, or to the line which on many papers is printed to ensure accuracy (Fig. 1).

Making Paste. Good paste powder, to be mixed with either hot or cold water, can be procured in convenient size packages, but the best paste, however, is home made. To 3½ lb. of best household flour add only sufficient cold water to make a stiff batter. Mix in a clean pail and add 1 gallon of boiling water in which two small table-spoonfuls of ground alum have been boiled. The batter should be well beaten up as the water is added, and the paste should be free from lumps or it will need straining through butter muslin. When the paste is cool cover the top with a little cold water to prevent a crust forming, and then leave it to get cold. This paste should be of a stiff consistency, requiring thinning with cold water before use.

Paste should not be used thinner than can be easily spread. A stout paper can be pasted with thicker paste than one of less substance. Heavily embossed papers may require paste to which a little glue has been added. The glue should be made in the usual way and poured on to the paste whilst hot, mixing thoroughly. Alum must be omitted from paste if the latter is to be used for papers with any "gold" or metal in their printing. Washing soda must be added to the water instead, but not more than ½ oz. for 1 lb. of flour.

Cutting Paper to Length. Before pasting, the rolls must be cut into the required length. If the paper is plain or does not require special matching at the edges, this length will be the vertical dimension of the space to be papered plus six inches, this for trimming at top and bottom (i.e. 3 in. at each end).

If the paper is patterned further consideration is necessary. The design must be examined and choice made of a suitable detail for finishing at the top so that the details of the pattern shall be as complete as possible. It is wise to select the most important details and choose a line across the width so that these shall not be mutilated. At the bottom of the wall the line is not so important, but with care it is often possible to arrange that the lengths are finished so that both top and bottom are pleasantly completed. Three inches beyond the line selected for finishing at top and bottom must be allowed for trimming.

Always examine the edges of rolls before trimming, to see whether there are marks indicating where the pattern joins. These joining points are given in instances where any difficulty might arise, also arrows showing the correct way up.

Pattern Repeats. In large patterns it may be that the important features do not repeat horizontally on each length but on alternate lengths. This characteristic constitutes a "drop" repeat, and in such cases the second length requires consideration at top and bottom in the same manner as the first. It is advisable before cutting to unroll three trimmed rolls on the floor, joining up the pattern and

laying rods at top and bottom, the distance between the rods being the vertical dimensions to be papered. Thus the choice of line for finishing on both lengths is easily made.

To take the curl out of the roll of paper unroll about 24 in. and let it drop over the edge of the table and back to it. Hold the opened roll in the left hand on the edge, with the right hand lightly pressing on the face of the paper. Then with the left draw the paper upward between the right hand and table edge. Repeat the operation two or three times and the most obstinate curl will be flattened.

Pasting the Paper. When the line for cutting and dimension are decided, the paper can be unrolled on the table face upward, with the uncurled end dropping over one end of the table, the dimension marked off and the required length cut. Repeat this until the roll is finished. Then turn the lengths face downward, any surplus beyond the ends of the table being equally distributed right and left. Push all the lengths about 6 in. away from the front edge of the table, then bring the top length toward the front, so that its front edge is quite level with the front edge of the table, and at the same time, with the right hand, pull the length so that its left end is resting on the table ready for pasting. Work the paste from the centre towards the edges, completing the left and farther edge before the front edge. The paper should be lifted between finger and thumb (as shown in Fig. 2), while the edges are pasted, so that the paste does not get on the face of the paper.

When rather more than half the length is pasted it must be folded over, pasted surface to pasted surface, being held as shown in Fig. 3, edges meeting exactly and lightly pressed with the hand. This folded piece can be folded again and the folds drawn to the left end of the table so that the unpasted right end can be dealt with in the same manner.

The right end should be folded over with the extreme end overlapping about an inch and then turned back, so that it can be gripped when releasing the folds for hanging. The extreme end of the left fold should be turned up in the same way, but no pasted surface must be left exposed between these two ends. When complete, the pasted length can be lifted off the table and placed on one side whilst another length is pasted, unless the paper is thin or absorbent when it may be necessary to hang immediately after pasting. Avoid the use of sloppy paste. Enough paste must be applied so that when the paper is folded over the surfaces will just slide easily under slight hand-pressure to bring the edges together. Heavy papers may require to be "freshened up" with a second application of paste. It is no use to attempt to hang paper before it has become supple; this does not mean saturated, however. A little experience will quickly enlighten the worker on these points, and the processes themselves which, to the reader, may appear elaborate will be found simple in practice.

Where to Begin the Work. Paperhanging should be begun at an angle of the room nearest to the light. If there are two important windows, start work centrally between them, working away to right and left. In this way succeeding lengths on each side are laid towards the light. The work should be finished in an angle where any join would be inconspicuous.

Presuming that the first length of paper is to be hung at the angle of a wall, commence by marking off the width of the paper from the angle at a point at about half the height to be papered. Using the plumb bob and line as a guide, mark several points above and below the centre so that a vertical line can be

made by using a straight edge. This line is to be the guide in hanging the first length. If a long plank is to be hung, successive lengths should be tested with the plumb line and corrections made, if necessary. It is advisable to plumb a line at every angle as walls are rarely as accurate as the paper hanger's joints need to be.

When ready for hanging take a length of the folded paper on the left forearm, the top nearer to the body (Fig. 4), mount the steps (which should be placed so that they are opened out in the direction away from the space to be papered), and when sufficiently high easily to reach the top, take the near loose end between finger and thumb of each hand and let the length fall gently, opening the pasted surfaces in falling. Apply the top of the length lightly against the top of the line, allowing the 4-in. surplus for trimming to hang over. With the left hand holding the left top, use the right hand to adjust the edge of the paper against the line. Run the hand lightly up and down the edge, then use the smoothing brush, dabbing out

from the centre, upward, and downward. When the paper is smoothed out, hold the surplus top edge with the left hand and press the paper with the right hand against cornice or picture rail, and then with the back of the scissors, or a soft pencil, run a line along where the paper has to be cut off. Pull the paper away sufficiently to enable the scissors to be accurately handled, and when cut replace the end and fit down, making a good finish (Fig. 5).

The lower portion of the paper has to be dealt with in similar manner. Fig. 6 shows how the lower end is taken between finger and thumb and opened out. The bottom edge is finished the same way as the top. Use the padded roller lightly to get rid of blisters. In the case of embossed papers use the smoothing brush only for this.

The second length must be hung to fit closely up to the first (Fig. 7). The position of the steps must be reversed for this length as the adjustment is to be made in the opposite direction in relation to the plumbed line. When several lengths have been hung the edges should be rolled down but not immediately after hanging.

How to Paper Ceilings. Ceilings are papered in the same way, but the paper has to be folded in a number of short folds after pasting. These are

made under one another in succession until the length is in a neat pile of folds which must be turned upside down, and can be held on a roll of paper in the left hand, whilst the right opens out the folds, adjusts and brushes the paper on the ceiling.

Papers in high relief must be well pasted, and allowed time for the paste to render them ready for hanging. The raised pattern should be carefully guarded. Rollers should not be used except on flat surface which adhere to the wall or ceiling. Manufacturers of relief materials issue instructions for hanging and these should be carefully observed.

Borders are frequently used with unpatterned papers and present no difficulty in hanging except that they must be placed with accuracy so that paste is not transferred to the paper which the border does not cover. Borders which have a 'cut out' edge are generally supplied perforated in the roll and should be pasted before tearing apart. Any waste lengths of paper are useful for taping borders on, face downward, for pasting. Use fairly stiff paste for this purpose.

Panels. Panelling with borders is a very effective method of decoration and adds importance to the appearance of a room. Special borders termed 'stiles' are made for the purpose and can be obtained in several widths, the narrower being used for bedroom and the wider for reception rooms. Setting out requires to be carefully done, and the proportion of the panels in the relation of height to width is important. A rectangular panel does not look well if the width is more than three-quarters its height. A square panel is satisfactory, as is also a double square. Very fine examples of panelling are frequently to be found in Georgian and Adam houses.

General Hints. Old distemper should be removed by scraping and washing before papering. Walls that have been painted should be rubbed with coarse glass



Paperhanging. Fig. 1. Trimming edge with scissors. Fig. 2. Pasting. Edge lifted to prevent paste getting on face of paper. Fig. 3. Folding pasted paper, edges meeting. Left end folded over with turn-up for gripping. Fig. 4. Carrying paper on the forearm, top end toward body. Fig. 5. Finishing the top. Paper is pressed against picture rail, surplus being held down while a line is marked. Paper is then drawn down slightly, cut, and replaced. Fig. 6. Loosening lower fold. Turned back edge underneath is drawn gently downward until fold is undone. Fig. 7. Making butt joint. Hanging second length, working towards the light. Paper is held by right hand so that right side does not quite touch the wall, whilst with the left the edge is adjusted.

From photographs specially taken for this work by arrangement with Arthur Sanderson and Sons Ltd

paper, treated with clearcoke and then lined, otherwise the paper will not adhere but open at the joins. If a straight edge is not available, lines can be "snapped" on a wall by the use of a chalked line, this being a line cord covered with coloured chalk. Fasten the line with pins at the ends or otherwise hold it tautly in position, lift the centre and let it snap when a chalk impression will be left on the wall. Printed instructions for hanging papers are frequently enclosed in rolls by the makers. Such instructions should be carefully followed.

PAPER KNIFE. Used for cutting paper and opening envelopes, etc., the paper knife is obtainable in a large number of shapes and sizes in gold, silver, ivory, mother of pearl, bone, wood and other materials. Small paper knives can be made from old piano keys, which are often discarded as useless at a piano repairer's. If the ivory or composition is scraped with broken pieces of glass to clean and level the surface, the edges filed to shape and smoothed with glass paper, they may be polished with French chalk mixed to a paste with sweet oil, applied with a nail brush and finished with a soft rag.

The fretworker can exercise his craft to advantage in cutting out shapes both in wood and metal, utilizing initials and monograms as ornamentation for the handle. Boxwood, sycamore, and ebony are all useful for this purpose. The design is drawn out on a sheet of paper and filled in with ink, afterwards being pasted on the wood. In working out suitable designs, especially in lettering, tries must be provided to keep the design together.

The metalworker can utilize copper, brass, and silver, working out flat forms with pierced, engraved, etched, or repoussé ornamentation. The metal may be left quite smooth and bright, polished up with putty powder applied with a hard brush, and then lacquered.

PAPER NEGATIVE. Negatives on sensitized paper instead of film or glass have their uses, and special sensitized paper of various speeds can be obtained from the photographic dealers. Exposure and development are on normal lines, but the developer must be a clean, non-staining one, such as metol-hydroquinone, azol, kodol, etc.

The chief use for paper negatives is in the production of enlarged negatives, for producing large prints by the platotype or carbon processes, as well as for obtaining a considerable number of copies of an ordinary bromide enlargement. A positive or transparency is required for each of these purposes, and can be made by contact from the original negative on a slow-speed plate, the method being the same as in the production of a positive transparency for a lantern slide (q.v.).

When this transparency has been obtained, it is placed in the enlarging lantern, and the necessary enlargement made on ordinary bromide paper or the special negative paper, the latter showing less grain. With the enlarged paper negative so obtained as many large prints as are required can be made by contact, or the carbon or platotype processes.

Paper negatives offer special facilities for easy, broad retouching. If for instance in a landscape it is desirable to strengthen the high lights (the parts that print white), it is only necessary to work with a pencil on the back of the paper negative. Similarly, if a light background is required to a portrait, appropriate and judicious working on the back of the paper negative will produce the effect in the positive print, without betraying the fact that retouching had been done. Alternatively, strengthening of the shadows can be done by ordinary methods of retouching on the positive transparency. See Carbon Printing; Developing; Negative; Printing; Spotting.

PAPIER MÂCHÉ: PLAIN AND DECORATED

How to Make Useful Household Pieces

Additional information on the subject of decorating papier maché articles can be found under the headings Italian Renaissance Work, Lacquer Work, Pattern Printing, Stencilling. See also Artificial Flowers, Paste, Tray, Victorian Style.

Papier mâché is manufactured from highly compressed paper pulp moulded to shape during the process of making and then painted and varnished or enamelled. The commercial articles are machine made, but papier mâché can be made at home. Vases, bulb bowls, trays, fire screens, powder bowls, waste paper tubs, and washing up basins can be constructed from materials which cost very little beyond the time and skill expended on them.

Although used for the simplest objects, this material affords a light and excellent basic composition for painting and lacquer work and has been decorated for centuries by artist craftsmen of many nations. Our first illustration shows a beautiful example of

water until it is thoroughly soaked through, and meanwhile prepare some ordinary flour paste, to which a little alum is added, as this makes the paste more adhesive. It should not be very thick, but should be of a semi-liquid consistency.

Coat the inside of the bowl with soft soap, to prevent the paper sticking to it. Then take the paper from the water, dipping one piece at a time in the paste and drawing it through the fingers to make sure the paste is evenly distributed. Spread the paper over the bottom of the bowl. Repeat the process until the whole of the interior is evenly covered; each piece must overlap slightly so that they adhere to each other. Allow the paper to extend from

1½ in. to 2 in. beyond the rim of the bowl, and continue laying on the pieces of paper until the layers are ¼-½ in. deep.

Large objects require to be thicker, whilst small bowls need not be more than ¼ in. thick. Now place the bowl before a bright fire or in a moderate oven until thoroughly dry. Draw a pencil line round the rim of the mould on to what will be the outside of the new bowl. Remove the mould, and with a sharp keyhole saw or strong scissors cut off the edge along the pencil line. Rub down this edge as well as the whole of the interior and exterior of



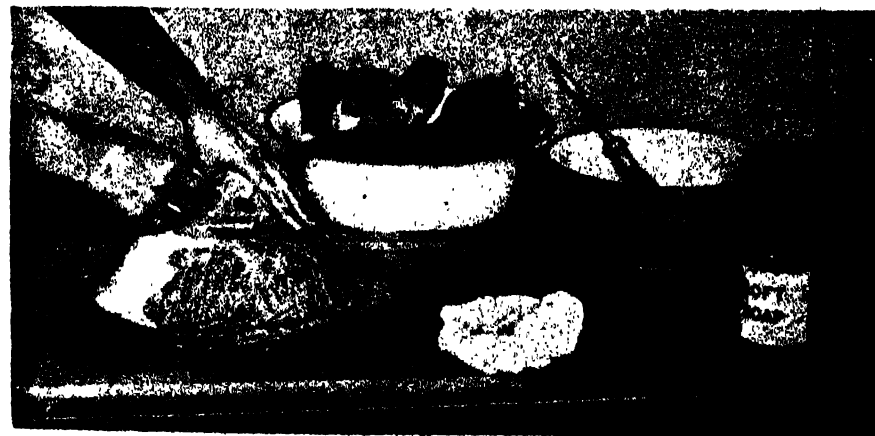
Papier Mâché. Fig. 1. Antique Persian box in papier mâché with inscription "The work of Mirza Ali Muhammad, Iran."

a Persian papier mâché box with an exquisitely painted design. In the 17th century this material was employed for lovely Persian bookcovers, and much early English lacquer work was done on papier mâché trays.

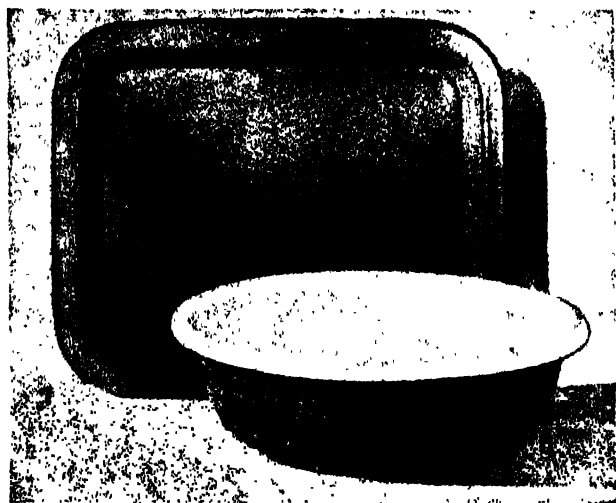
Moulding the Shape. For a first attempt a bowl or tray should be made, as the method is simple. Procure a bowl of china or metal to serve as a mould. Take any old newspapers or magazines and tear them into irregular shaped pieces, the size depending on whether a small or large object is being made. On no account must the paper be cut; tearing gives it a bevelled edge, which ensures a better fit when pasted on to the mould. Leave the paper in

the papier mâché bowl, first with a medium, then with a fine glass paper. Number (0) is best for the final rubbing down. To finish, size, paint, and varnish the object. A bowl or anything that is being used for a mould can be equally well coated with the paper from the outside as shown in Fig. 2. This method is necessitated when the mould in use is vase-shaped.

For a washing up bowl, such as that illustrated in Fig. 3, two or three coats of ordinary white enamel are most suitable for the interior, while blue, grey, or brown can be used for the outside. A marbled or mottled effect is obtained as described in page 671. Very attractive and decorative bulb bowls can be made by



Papier Mâché. Fig. 2. The paper is torn into irregular pieces, soaked in water, then covered evenly with paste and spread, each piece overlapping the other, on the surface of the bowl or other mould.



Papier Mâché. Fig. 3. Bowl which lessens the risk of breakage when washing up; and a tray enamelled in bright colours
Courtesy of Stainless Kitchen Equipment

painting the inside in some bright colour that contrasts with the outside, such as orange and black, primrose or grey and apple green. A still more artistic effect is obtained by lacquer decoration in colours as well as gold, bronze, and silver. A fruit bowl lacquered black with a design of gold or merely lined with gold is uncommon, and goes well with schemes where a brilliant colour would be out of keeping. Stencils can be employed with good results, and so can gesso decoration. A good hard varnish must be used in the case of bulb bowls to withstand the damp from the fibre.

A tray or any article which tapers towards the bottom can be made in the way described. One like that illustrated in Fig. 3 can be modelled on an old tin tray and enamelled in a bright colour.

Should there be no object handy that can be used for a mould, a lump of modelling clay may be shaped into the form desired. A simple method is to roll out the clay on a board in the same way as pastry to a thickness of 1 in., and cut it out into circular pieces varying from the smallest to the largest diameter. Place one on to the board and build up the mould with the rounds in required order of size, filling in the steps between each layer with clay. If the mould is not going to be used immediately, keep it covered with damp cloths to prevent cracks appearing. Well cover the clay model with soft soap and also the board round it for about 4 in., or the edge of the paper will stick to the board. The procedure is then the same as before.

Any skilled worker who wishes to produce narrow-necked vases, jugs, etc., in papier mâché, can first make 2 models in clay, each one a longitudinal section of the object. The edges of the papier mâché, after the preliminary moulding has been completed as already described, are cut absolutely true and then glued together; when the glue is quite set 2 or 3 coatings of paper are applied to the outside of the vase or jug. These last coats of paper must not be dried artificially, but merely left in a dry room, or the object will warp and get

out of shape, as it has no mould inside.

To make a waste paper tub or basket from papier mâché is an easier task. An old size tin, or any other round tin of suitable dimensions, will make a good model. Finding a tin, a piece of stout cardboard can be rolled to fit a circular bottom, then glued and allowed to harden. Plasticine is used to round off the join on the outside so that any cracks are eliminated in the finished article and it is given a slightly moulded base. The procedure is the same as for the bowl in Fig. 2. Special attention must be paid to the rubbing down, as if the surface is large any roughness will be very noticeable. The old papier mâché workers used

pumice-stone for the final rubbing down, and then polished the work laboriously with a chamois leather. This was worth while, as it produced an excellent surface for decoration.

Flower, sporting or other prints form excellent panels for decorating such articles after the final enamelling is completed. In order to ensure better wear the whole article is varnished after the print or, if preferred, a hand-coloured panel has been pasted on and outlined with black. The top is given a finish of gold or silver or bronze paint outlined with black. Mottled paper may be used to line the basket or it may be finished in enamel. Chinese lacquer designs are particularly suitable for a handsome waste-paper tub. Cheap enamel dishes and sugar basins make serviceable moulds for small trays and bowls.

Decorated Panels. A papier mâché panel for a table top or fire screen is made on any flat tin or metal plate. If really good decoration is intended by a skilled amateur, the old method of making the panel may be followed. An odd length of cheap not surfaced wall paper is quite a satisfactory substitute for the special paper that was used. About 12 sheets should be cut out of the desired size for the panel.

The metal plate is oiled before the first damped sheet is laid and covered with paste and alum. The old workers used a mixture of

glue, flour, and resin. Another sheet was laid over, perfectly flat, and then plate and sheets were placed in a cool oven to dry. The surface was then rubbed down with pumice stone, to ensure smoothness before the next sheet was applied. All the sheets were thus applied and dried in the oven before the panel was completed and strong enough for a table top or tray. To form a moulded edge, the paper would be taken over the edge of the metal, shaped by hand, and cut off with a keyhole saw or a safety razor blade.

In some of the beautiful floral designs of the first half of the 19th century pearl was used, as in the table top shown in Fig. 4. In others, large flowers and leaves were painted in bronze colours and gold. After 1845 oil colours and bronze colours were utilized in the same designs. Pearl was still used, but was less seen as the more gorgeously coloured designs became increasingly popular.

The pearl effect was gained by use of thin layers of nautilus shells, and these were stuck on to the surface of the papier mâché with glue. In papier mâché decoration to-day the thinnest shells obtainable for artificial flower making can be specially cut, and coloured with spirit stains sold for the purpose. Fish scales can also be used. Very rich effects can be got by use of such shells or scales for portions of flowers with oil and bronze colours, for other portions and for leaves, when carrying out a floral design for a panel.

Commercial papier mâché consists of paper pulp compressed and moulded. Usually some earthy material is added, with glue, or resinous matter, to help to bind it. This composition is then rolled into thick sheets, which are moulded and pressed to the requisite shape, and dried, after which the article can be decorated with enamel, paint or by inlaying. Trays, boxes, masks, and even light furniture are sometimes made of papier mâché.

Care of Papier Mâché. Old pieces of decorated papier mâché require careful cleaning. Sometimes a beautiful piece has been so neglected that the original colour and lustre seem quite lost. A soft flannel, dampened, with a very little pure curd soap on it, is the best cleansing agent. When the dirt has been removed, the papier mâché should be gently dried with a flannelette duster, a little furniture cream put on with the tip of a finger, and the surface immediately polished with an old piece of softest silk. Valuable decorated papier mâché articles should not be exposed to damp, and should liquid be spilt on tray or table top it should be dried off at once.

PAPILLON. This toy dog is popularly known as the butterfly dog, owing to the supposed resemblance of the ears to the wings of a butterfly. Papillons were introduced into England in 1923. The papillon has a very profuse coat of a silky texture, and the large ears can be well feathered. It is a loosely coupled little dog, with a wedge-shaped head. The body colour is white, and the markings either lemon, brindle, brown, or black. If these are evenly distributed it gives a better appearance to the dog. The smaller the markings are the more highly esteemed the dog, providing it has quality in other respects. See Dog.

PAPYRUS. This ornamental grass of Egypt requires aquatic treatment in a heated glasshouse when it is grown in Great Britain. It attains a height of about 6 ft., and has dark green leaves. Cultivation is in pots of loam, leaf-mould, and sand, plunged in tubs or tanks of water. Propagation is by division of the root stock.

PARADISIA. This hardy perennial grows 2 to 3 ft. high, and has grass-like leaves and white flowers in early summer. *Paradisia*

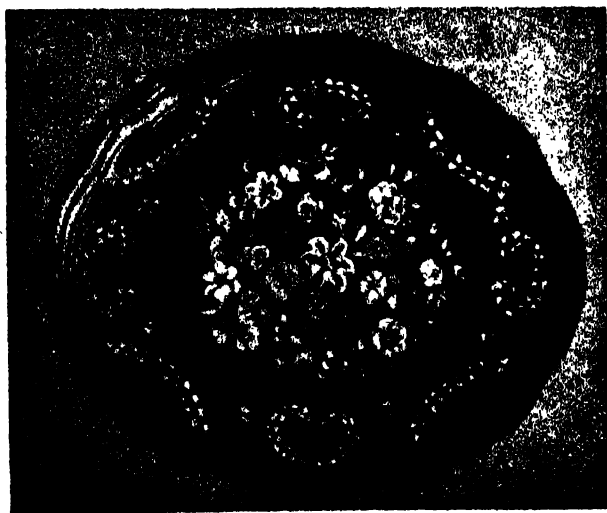


Fig. 4. Beautiful early 19th century example of a papier mâché table top, decorated with shell, bronze and colour

hiliastrium (*Anthemum hiliastrium*) flourishes in ordinary garden soil. It is known as St. Bruno's hily.

PARAFFIN. The name of paraffin is applied to a whole series of organic substances, which includes marsh gas, naphtha, benzene, petrol, petroleum lamp oil, heavier lubricating oils, vaseline petrolatum, cosmoline, adepsine, and the hard paraffin of which candles are made.

Paraffin oil, which is also known as kerosene, is chiefly used for illuminating and heating purposes. The thinness of the oil gives it the peculiar property of spreading or creeping, so that it is important when filling lamps to avoid excess of oil. After filling a lamp all traces of oil on the outside of the container should be wiped off, as otherwise the unpleasant smell of paraffin will be given off when the lamp is lighted.

Heavy paraffin oil forms the base of lubricants for sewing machines and lawn mowers, and a good deal of petrol is made from paraffin. Floor-sweeping compound is made by mixing 1 pint of paraffin oil with 10 lb. of dry sawdust. This is used for hardwood floors, a little being sprinkled on the floor before it is swept. See *Burner, Lamp, Oil, etc.*

Paraffin Wax. The white solid that is obtained as a residue in the purification of petroleum resembles white beeswax, for which it is a cheap substitute. The chief commercial use is in the manufacture of candles. As a floor polish, paraffin wax is made into a paste with either oil of turpentine or a mixture of equal parts of paraffin oil and benzene. Paraffin wax has another important application for electrical insulating.

Some Medical Uses. In therapeutics, hard, soft and hard paraffin and paraffin oil or

petroleum are utilized. It should be noted that liquid paraffin is quite a different thing from paraffin oil. Liquid paraffin is used internally as a laxative and also in the form of petroleum emulsion to aid assimilation of food. It is often used to spray the pharynx and the nose. Soft paraffin or vaseline is an excellent basis for ointments. Hard paraffin is sometimes injected under the skin of the nose to correct deformities. Paraffin oil is applied to the head to kill lice.

PARALLEL BARS. One of the most commonly used of all gymnastic apparatus, parallel bars are subjected to considerable strain, and must be strongly made. The framework may be of deal or pitch pine, but the bars are always of straight-grained ash, and in the best apparatus they have a core of steel. A satisfactory pair of bars (Fig. 1) can be made in the following manner with ordinary deal and two lengths of selected ash. The width between the centres of the bars for home use should be 2 ft., but they can be wider apart if required. The total height is 4 ft., with fixed bars which are 8 ft. long.

The bottom framework is made from 5 in. by 3 in. wood, planed smooth and true to these sizes, but 6 in. by 1 in. deal can be used, and when passed through the planing machine will not be much larger than 5½ in. by 3½ in. Two grooves marked out on the long pieces are the exact width of the wood, and 12 in. from each end. Gauge lines are marked half-way down, and the waste removed with a chisel (Fig. 2). The cross pieces are 4 ft. long.

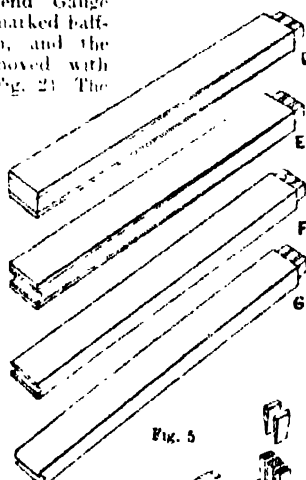


Fig. 1



Fig. 2

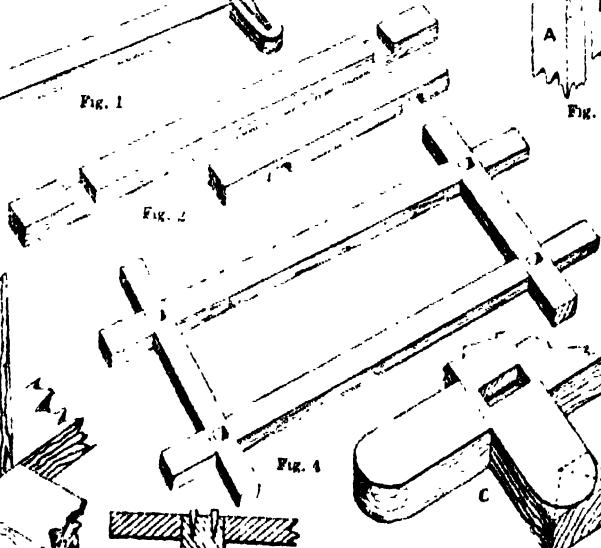


Fig. 3



Fig. 4

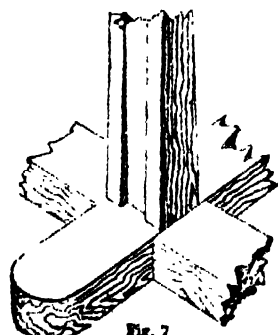


Fig. 5

Parallel Bars. Fig. 1. Bars completed. Fig. 2. Rails. Fig. 3. Tenon on uprights. Fig. 4. Bottom framing. Fig. 5. Uprights. Fig. 6. Same wedged. Fig. 7. Groove for bracket.

the grooves are the same width and depth as the others, and 9½ in. from each end. The ends of all four pieces should be rounded.

The four uprights are tenoned into the base, and are cut to 4 ft. from 5 in. by 3 in. wood. The ends are marked down 3 in. for the tenon; then 1 in. from the edges and ½ in. from the sides, as shown at A, Fig. 3. The tenons are then sawn down as shown at B. Corresponding mortises are cut in the bottom framing as indicated at Fig. 4; an enlarged view of one corner is shown at C. Each of the uprights is now tapered, lines being marked as shown at D, Fig. 5, and sawn down; the top is hollowed, E; the sides planed, F, and finally the top corners are chamfered, G.

The uprights are glued and wedged in position as shown in the section at Fig. 6, leaving the 8 ft. ash poles to fit in position. First smooth the wood carefully with glasspaper, and then provide eight 4½ in. steel ribbed brackets and attach them to the underside of poles and sides of uprights with round-headed screws. The uprights are also strengthened with large steel brackets, 10 in. by 14 in. Owing to the sides being tapered they must be let into the wood as shown at Fig. 7. The bottom can be boarded in by nailing on 2 in. by 1 in. strips on the inside of the long bottom lengths, and then fitting 1 ft. 7 in. lengths of 1 in. floor boarding between. The framework may be painted or varnished, but the bars themselves are left clean from the glasspaper.

PARALYSIS: Its Causes. Paralysis is the loss of power to contract the voluntary muscles. There are two sharply divided groups, namely, paralyzes which are hysterical and those which are of organic origin. Hysterical paralysis may follow a physical or a mental shock. The physical cause most frequently responsible has been a railway accident. Mental causes include disappointments in love, grief, fright, anxiety, overwork, prolonged strain, etc. In a large number of cases, however, these influences are merely the precipitating factors, the condition being due fundamentally to some psychic influence.

Hysterical paralysis differs from organic paralysis in that in theory every case is curable, and in practice the great majority are cured, this being effected by purely psychical methods.

Organic paralysis is due to injury or disease of the nerves or brain. A common cause is apoplexy or stroke, due to rupture of a blood vessel in the brain, with resulting damage to the nerve cells in the neighbourhood. A familiar form is locomotor ataxia, a condition characterized in the early stage by inability to control the muscles, thus leading to an irregular jerky gait. Neuritis, or degeneration of the nerves, may result from prolonged alcoholism or chronic poisoning by lead or arsenic. Infantile paralysis is a condition, seen most often in young children, in which paralysis of one or more limbs supervenes. The treatment for organic paralysis varies very much with the cause. When due to definite disease, the treatment must be directed towards combating that disease. In acute cases the patient should be kept in bed, and care must be taken in preventing the formation of bed sores (q.v.).

Paralysis of the Insane. This disease is due to inflammatory and degenerative changes in the brain, by reason of which both mental disorder and paralysis of muscles occur. It occurs mostly in middle life among men who have overtaxed their brains or put a prolonged strain on the nervous system. Injury to the head, abuse of alcohol, and worry favour the onset of the disease.

In a majority of cases it is advisable to remove the patient to a mental hospital, and very often this should be done early in the disease, both in the interests of the family and of the patient himself. See *Infantile Paralysis; Insanity; Locomotor Ataxia.*

PARAMIDOPHENOL. The photographic developers of the paramidophenol class are very clean and stainless in working and keep well in a single stock solution, needing only the addition of water before use. They are effective for all kinds of photographic work. The best known examples are azol, kodol, rodnal, and rytol. Taking azol as an example the following are the quantities to be used.

	Azol	Potassium bromide 10 %	Water to make
Plates and films (normal develop- ment)	20 drops	—	1 oz
Day-light papers (soft or normal grades)	40 "	2 to 5 drops	1 "
Do. (vigorous grade)	40 "	10 "	1 "
Bromide papers	15 "	—	1 "

The Watkins factor for development with azol is 30 for average contrast. The detailed tables for development by time and temperature for all the plates and films on the market are published by the makers of the azol developer. See Developing.

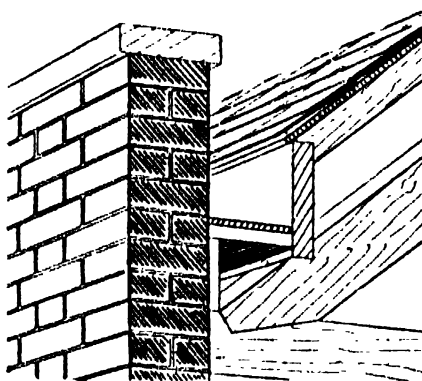
PARAPET. A low wall or parapet is often used to protect gutters and roofs of houses, and it should be periodically examined to see that it is perfectly sound, and not liable to crash to the ground. A consideration with the roof and guttering, when a parapet forms part of the building, is that the mortar is liable to weather very rapidly, and the result is that a heavy fall of snow or other cause may result in the parapet being entirely demolished. A preventive of this is to rake the mortar joints, and then to re-point them with cement mortar. The parapet illustrated above is shown with simple capping. In many types of building a parapet of stone or cement is employed as a decorative feature. These weather rapidly owing to their exposed position and the smoke from adjacent chimneys, and can be treated effectively with proprietary brands of waterproofing materials.

A simple treatment available to the amateur is the use of a cement wash composed of equal portions of Portland cement and sand, brushing it on with an old stiff brush. Where the parapet is painted, it requires to be given a fresh coat at least once in every three years with a thoroughly durable and first grade paint of outdoor quality. See Wall.

PARCEL: How to Pack. If a parcel must be made of several items of divergent sizes and shapes, the only safe plan is to procure a cardboard or wooden box large enough to take them all. Any crevices should be tightly packed with a stuffing of crumpled newspaper to prevent the contents from moving. Breakable goods such as bottles of medicine should be wrapped in corrugated cardboard before being put into paper, the outside of the parcel being marked "Glass, with care."

A parcel which is of considerable weight, or which is being sent a long distance, should be wrapped in paper, firmly tied with plenty of string and addressed. Then the whole process should be repeated. The second wrapping gives extra solidity and strength, and the second addressing provides for the accident of one being torn off in transit. Photographs should be sent in the special wrappers, backed with cardboard, which are sold for the purpose; failing these, the parcel or envelope containing them should be stiffened with a sheet or two of cardboard.

Book Parcels. A book should be placed in such a way that the edges of the cover cannot suffer. One method is to enclose it, as shown in Fig. 1, between two boards, cut $\frac{1}{2}$ in. larger on every side than the book covers, and to tie this up carefully before wrapping in



Parapet of brickwork built on a house for the purpose of protecting roof and gutters

strong paper. Another method is to use corrugated cardboard.

This is cut roughly cross shaped, as shown in Fig. 2, the broad centre-piece folding over the spine and front edges of the book, the narrower length protecting the upper and lower edges. The corrugated side of the cardboard is placed innermost, and the cut edges must overlap those of the book. If packed in this way, however, it will not travel by book post, which demands open ends. If no cardboard is available, a book can be first wrapped in several thicknesses of newspaper.

String of suitable thickness should never be spared, and it should be fastened tightly. Each parcel should be addressed very clearly in full, and twice over. This may be done on the outer wrapping itself, if the paper is of a colour and surface to take ink well.

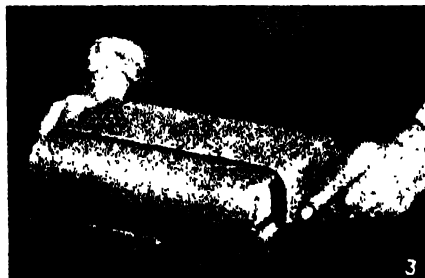
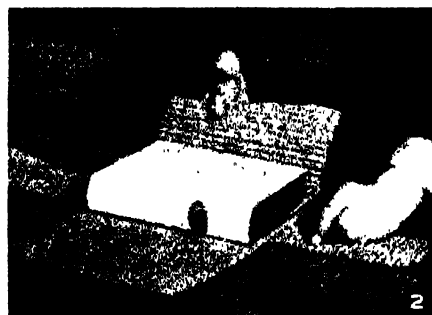
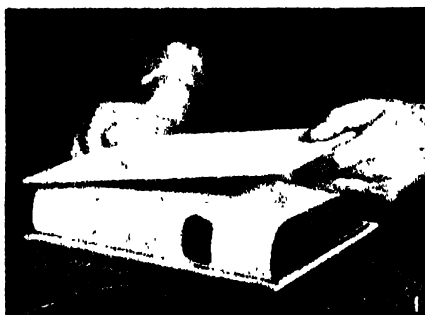
otherwise labels, one stick-on and one tie-on, should be used. A parcel of a fragile nature should always be addressed on an accompanying tie-on label and not on the parcel itself, as the heavy stamping of the postmark, if made on the parcel, may crush the contents. Parcels intended for registration are not accepted for delivery by the post office unless every intersection and knotting of the string is sealed with sealing wax. Also, the outer paper wrapping or box must be intact.

All these precautions apply with double force to the sending of Christmas parcels, for at that season the mails are so crowded that they may receive rougher handling than usual. Gift parcels not intended to go through the post may be wrapped in gaily-designed papers and tied with tinsel ribbons.

PARCEL POST. In Great Britain goods, provided the parcel does not exceed 15 lb. in weight, can be sent through the post office. The parcel can be handed in at any post office, where it is weighed and stamped. In rural districts it can be handed to a postman. The charges (1952) are:

Under 2 lb.	11d
Between 2 lb. and 3 lb.	1s. 1d
Between 3 lb. and 4 lb.	1s. 3d
Between 4 lb. and 5 lb.	1s. 5d
Between 5 lb. and 6 lb.	1s. 7d
Between 6 lb. and 7 lb.	1s. 9d
Between 7 lb. and 8 lb.	1s. 10d
Between 8 lb. and 11 lb.	1s. 11d
Between 11 lb. and 15 lb.	2s. 0d

The parcel must not exceed 3 ft. 6 in. in length, nor 6 ft. in length and girth combined. A parcel can be registered at a cost of 6d., which payment carries with it the right to compensation for loss or damage up to a maximum of £5. For 7d., compensation can



Parcel. How to pack a book. 1. One method is to place it between boards before wrapping in paper. 2. Corrugated cardboard cut to the shape required. 3. Cardboard folded over. 4. Wrapping in stout paper. 5. One end folded and strong string tied tightly. 6. Finished parcel calculated to defy rough postal treatment.

be obtained up to a maximum of £20, and every additional 1d. means an additional £20 for compensation up to a maximum of 2s. 4d. but before use it should be cut to the approxi- for £400. Compensation up to a limit of £3 mate shape and dipped in water to soften it will be given on unregistered parcels if the sender obtains a certificate when sending. To secure compensation, the parcel must be long; if this is allowed and the jar is covered securely packed, it will not be paid for damage to eggs and other very fragile articles. split when it dries.

Parcels can also be sent to British possessions and to most foreign countries. The maximum weight of the parcel that can be sent varies, but in no case does it exceed 22 lb. Parcels up to this weight can be sent to France. These parcels are subject to the ordinary custom duties. The charges and regulations as to size vary, but the information can be obtained from any post office. Parcels sent to most countries can be insured, but not registered. The insurance is limited to £400, for which a payment of 5s. 10d. is necessary.

Parcels by Air. Parcels can be sent by air to foreign destinations under the same general conditions as if sent through the post in the ordinary way. They can be handed in at any post office that accepts parcels for abroad. A special blue air mail label must be affixed to the address label of the parcel and to the relative despatch note, and the words air mail should be written conspicuously on the cover of the parcel. In addition to the more rapid transit, an air parcel is usually given a speedy clearance at the customs. The Post Office issues regularly an air mail leaflet which gives full details about this service.

PARCHMENT. Made from the skins of sheep, goats, and other animals, parchment is used for bookbinding and illuminating, coarser kinds being used for drumheads, buttoes, and tambourines. It is prepared by frowning the skin from hair and flesh while it is attached to a stout wooden frame, subsequent treatment being similar to that adopted for leather.

For the repair of musical instruments it is not necessary to use new material, old deeds, which are often obtainable, are quite suitable. For use in the panels of lamp-shades, parchment may be made nearly transparent by soaking a thin skin in a strong lye of wood ashes, wringing it out again and again until it is fairly transparent. It may then be varnished with mastic varnish. Staining is effected with aniline dyes or waterproof inks, but the skins must be stretched tight while drying. Illuminated parchment which has become dirty and gloomy may be cleaned with benzine, and if the colours require touching up, ordinary water colours mixed with Chinese white can be used, but specially prepared colours are supplied for the purpose. Stiff parchment will soften in water, but a fairly permanent flexibility is obtained by soaking the skin in glycerine. For new drumheads or tambourines preliminary soaking in water will be quite sufficient.

The parchment mainly used in the home is known as vegetable parchment, and is made by dipping ordinary, unsized paper for a few seconds in diluted sulphuric acid in the proportions of one part of acid with half its volume of water. It is thoroughly washed in water and acquires a parchment-like texture and becomes about five times stronger than ordinary paper. It is impervious to water but is rendered soft and limp when dipped in it. The stout qualities are used for bookbinding, and although not so durable as animal parchment, it may be worked up in the same way. For making lampshades and covering small screens or writing desk sets it is very useful, as it may be varnished to render it more durable; it can be stained to any colour and may be painted.

Such parchment is employed for covering jars containing preserves or anything that can

be contained in a jar from which an must be excluded. Several thicknesses are obtainable, but before use it should be cut to the approxi- mate shape and dipped in water to soften it. Owing to its property of stretching when wet, care must be taken to prevent it soaking too much. To secure compensation, the parcel must be long; if this is allowed and the jar is covered securely packed, it will not be paid for damage to eggs and other very fragile articles. split when it dries.

Vegetable parchment is an excellent material for making moth proof bags; it can be obtained in large sheets, it is not expensive, and when the bags are properly made the contents are airtight as well as moth-proof. The bags should be made with a double fold at the edges secured with thin fish glue rubbed on evenly. See Candleshade; Lampshade.

PAREGORIC. Compound tincture of camphor, commonly known as paregoric, is much used in cough mixtures, and also for the relief of colicky pains. It contains, besides camphor, aniseed, benzoic acid, and opium. In view of the presence of opium, which gives paregoric its soothing effect, the remedy should not be used except under medical direction.

Parent. See Father; Guardian; Mother.

PARFAIT. Except for the fact that it is usually richer in cream and served in tall glasses, a parfait is an iced sweet, similar to a sundae, made with fruit syrup, grated nuts, ice cream and whipped cream.

PARGING. The process in building known as parging renders the inner surfaces of a brick-built flue smooth and fire-resisting. Parging is similar in its essentials to cement rendering, and various mixtures are used by different operatives. A commonly used composition is one part of Portland cement to two parts of good, clean, sharp sand, the proportions being gauged by bulk.

In some cases a mixture of fireclay and cement is used, but generally much of the parging of a flue is done with ordinary lime mortar. Parging is done as the work proceeds, that is, as the bricklayers construct the flue, the inner surface is rendered with the cement and trowelled off smooth.

PARIAN WARE. The most valued period of the statuary porcelain known as Parian ware lasted for about 30 years after 1845. Invented in the Copeland works, as the outcome of a search for the lost secret of Derby biscuit ware, it was adopted at the Minton, Wedgwood, Worcester, and other factories. Some early figures are recognizable by having a small proportion of glass mixed with the body paste, but the finest were made of china-clay and felspar alone, in a mixture which enabled them to be fired at a lower temperature than ordinary bone-porcelain.

The best examples, pure white and unglazed, are superior in transparency to the opaque Derby biscuit, and have the general effect of the Carrara marble, which they sought to emulate. Sometimes a lead glaze was added, and this was especially well done at Longton. Unfortunately the designs are not particularly

good. Unglazed Parian should be kept clean with pure water, in the same way as biscuit, because of its porous surface. See China.

PARING CHISEL. The blade of a paring chisel is considerably longer than that of the ordinary firmer chisel, and there are two forms, the ordinary parallel type of blade, and that with a bevelled edge. The latter is preferable for paring, that is, cutting wood across the grain, as the blade is thin at the edges.

Since the tool is intended chiefly for cutting across the grain, it must be kept in very good condition, properly ground and well sharpened. It is handled in substantially the same way as the ordinary firmer chisel. Under some conditions the extra length of blade is an advantage, as, for example, when working at the bottom of a deep slot for a mortise, or under any other conditions where a deep hole has to be dealt with. Paring chisels are generally obtainable in widths from $\frac{1}{4}$ in. to 2 in., and the sizes most useful for the amateur are $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 in. See Chisel.

PARIS. The hardy perennial known as Herb Paris grows about 10 in. high, bears yellowish green flowers, and is suitable for a moist and shady position. It is planted in autumn or spring, and propagated by division of roots during the same periods.

PARIS GREEN. This is an arsenical insecticide made of neo-to-arsenate of copper, and is highly poisonous, particularly if inhaled in its ordinary powder form. A preparation known as Blundell's paste is the safest form in which it can be used. The paste is not soluble, but may be mixed as a fluid at the rate of 1 oz. to 10 gallons of water, with an addition of 4 oz. lime. It is used as a fine spray, the mixture being constantly stirred during use. It is efficacious as a wash insecticide for fruit trees,

but when applied to the peach, nectarine, or apricot, the quantity of paste must be reduced by $\frac{1}{4}$ oz. Trees should not be sprayed when in flower. It is best applied just before the buds open, and directly the petals begin to fall. See Insecticide.

PARKIN. This is a Yorkshire speciality. To make it, allow $\frac{1}{2}$ lb. butter or margarine to $1\frac{1}{2}$ lb. treacle, $\frac{1}{2}$ lb. brown sugar, 2 lb. oatmeal, 1 lb. flour, 1 oz. ground ginger. Dissolve the butter in the treacle over gentle heat, or by standing it at the side of the stove. Stir in the sugar and the ginger, and mix the flour and the oatmeal together. Stir in the flour and oatmeal, and mix with a wooden spoon. Add 1 or 2 beaten eggs, and a little milk if necessary to mix to a soft but fairly stiff consistency. Put it in a greased pudding tin. It should be 1 in. in thickness. Bake in moderate oven 40-50 min. Let it cool in the tin, then cut into squares, and store in an airtight tin.

PARLOUR. This old-fashioned term is still preserved by some people who own period houses, or who furnish a cottage sitting room in old-world style. The parlour should suggest the cosiness of a Queen Anne style (q.v.) of sitting room and stuffiness or formality should be wholly absent from its furnishing. See Furniture.



Parian Ware. Statuette in pure white unglazed porcelain.
Courtesy of W. T. Copeland & Sons

PARLOURMAID. A good parlourmaid can command high wages, and is next in importance to the cook as far as female servants are concerned. Where there is no butler, she is responsible for the glass and silver, and for the care and decanting of wines. She also waits at table, answers the front door, ushers in and announces guests, and takes in afternoon tea. All the dining room table work is hers. She is, moreover, expected to act as valet to any gentlemen in the house, laying out their dress clothes, and keeping their wardrobes brushed and tidy. See *maurice*; *Servant*.

PARQUET AND WOOD BLOCK FLOORING

Effective Methods of Decoration and Construction in Floor Coverings

An article that should be consulted in connexion with this subject is the one on *Floor*. See also *Carpet*; *Polishing*. Rug; the entries on the various rooms of the house e.g. *Dining Room*; *Drawing Room*; and those on the various woods, e.g. *Oak*.

The name is used to denote a floor of wood arranged in diaper formation. It is constructed by cutting thin boards into geometrically shaped pieces, and laying them down to form a pattern, much in the same way that tiles are laid. The thickness of the wood may be as much as an inch, but is usually thinner $\frac{1}{2}$ in. being common.

Parquet is mostly laid over existing floor boards, and may be regarded not as true construction, but as decoration. On the other hand, wood blocks are frequently employed in the way parquet is used, but laid on a solid foundation, such as concrete, forming part of the structural floor, but this is not true parquet. Almost any geometrical pattern can be rendered in parquet, consistent with the limitations of the material, which does not admit of very small detail. Both types of flooring are illustrated and described below. Instructions are also given for preparing and laying wood blocks which the amateur can make from commercial timber.

Austrian oak is generally used for parquet, owing to its close, even grain and freedom from knots. It has a rich, uniform colour, but is comparatively soft, easily showing marks. English oak is employed, but is uneven in quality, figure, and colour. Russian, Japanese and American oak are also used, and a very fine floor can be constructed of teak from Rangoon or Java. The best kind of parquet is what is called *plated*, consisting of about $\frac{3}{4}$ in. oak or teak pressed upon a backing of 1 in. deal. This method prevents buckling and is suitable for the best class of inlaid work. Parquet is usually laid down in made-up panels, varying from 12 in. to 1 yd. square.

Before the laying of a parquet floor can be commenced a design has first to be drawn. To do this, the room is measured, the size of the angles being noted as well as the length, breadth and the various breaks, such as the breasting of the fireplace, and a scale drawing of the plan is made on paper. Two typical designs with borders are shown in Figs. 1 and 2. When a decorative border is required, it is made sufficiently wide to extend beyond any of the smaller breaks or projections of the walls, so that the plain centre portion will thus finish against a straight line, as in Fig. 3. All larger projections or recesses must be followed round. From this drawing, the number of blocks required can be estimated and the length of the border decided upon.

The next consideration is the groundwork upon which the parquetry is to be laid. In new buildings it is usual first to lay a counter-floor on to the joists, thus consisting of deal battens $\frac{3}{4}$ in. thick placed diagonally and butted square into each other at the ends so that the joints will run diversely to those of the upper flooring. When levelled and cleaned off, this forms a good surface for the laying. In older houses a common practice is

to disguise well-worn deal floors with a layer of thin parquetry.

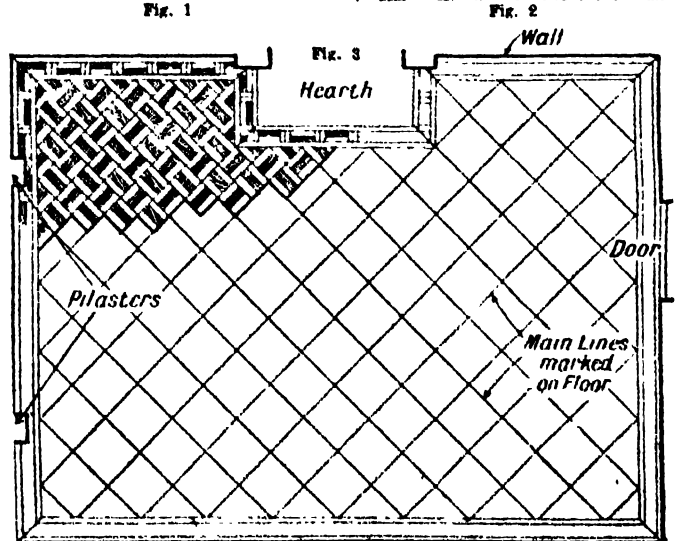
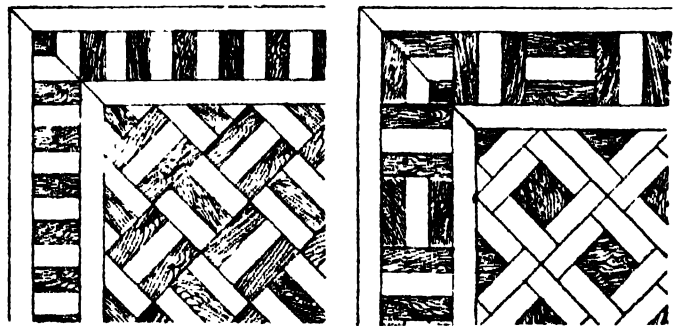
It is essential that the boards are first levelled, and any weak or creaking boards either replaced or the cause of the trouble rectified. The levelling is done by planing, first transversely across the grain with a jack plane, and finishing off with tryng plane, the edges by the walls being brought to the general level with a rebate plane. It is very seldom that all the blocks are laid individually in position direct on the floor. The usual procedure is to build up the individual patterns on a bench and then to apply these patterns to the floor.

Fig. 4 shows a complete pattern ready for fixing. With very thin parquetry and in the cheaper kinds there is sometimes no binding joint between the blocks. In this case the patterns are built up on the bench and a piece of canvas glued to the back. When set

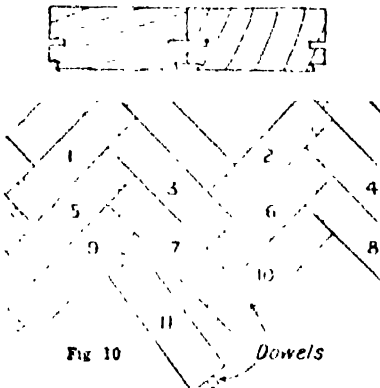
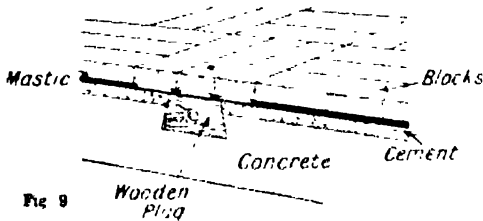
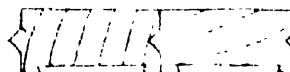
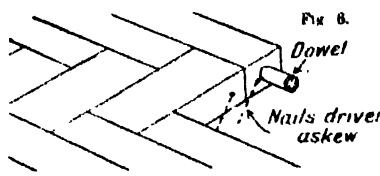
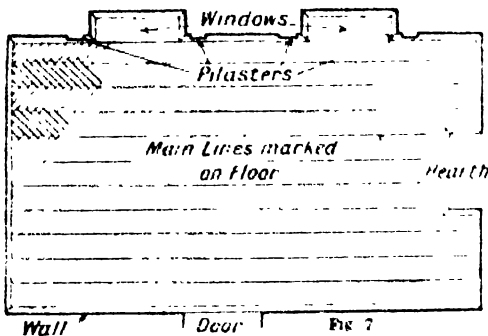
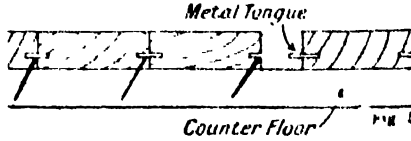
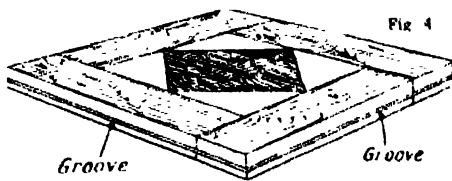
through the groove at the other side, so forcing the block well towards the preceding one and making a close joint. The procedure is repeated with another block as shown, the grooves of both blocks being thus automatically locked with one nail. The dowelled example in Fig. 6 is treated in a similar way, so that one nail locks the adjacent ends of two blocks. For first-class work the blocks are also glued in position, the underside being left roughened so that the glue will obtain a firmer grip.

In all phases of the work it is customary to fix the border before filling in the centre. This requires some care when turning it round shaped projections and recesses, as all parts should fit perfectly to obtain a good result. In the event of a large bow window requiring a curved bordering, a template of the shape is made and the pattern drawn on it. The blocks are then assembled on this and fastened together in sections, their relative positions being marked so that they may be reassembled in position on the floor. It is advisable to commence with all awkward portions such as this, fitting the straight pieces to them. In order to keep the pattern regular and symmetrical, the main lines of the design should be marked out on the floor (as indicated in Fig. 3), and the sections of parquet laid in accordance with them. When no decorative border is required, a length of stuff is first mitred round the edge, as in Fig. 7; this not only gives a finished appearance to the completed parquet floor, but forms a straight clean edge to fit the pattern against. It also obviates the necessity of cutting the blocks round any awkward projections in the walls, and is occasionally useful in the event of two opposite walls being slightly out of parallel, as the two strips may be tapered, thus leaving their inner edges equidistant throughout their

Fig. 4 shows a complete pattern ready for fixing. With very thin parquetry and in the cheaper kinds there is sometimes no binding joint between the blocks. In this case the patterns are built up on the bench and a piece of canvas glued to the back. When set



Parquet. Fig. 1. Design in two different coloured woods with simple border. Fig. 2. Showing use of both rectangular and square slabs. Fig. 3. Plan of room showing parquet design to be used, and arrangement of border.



Parquet. Fig. 4. Pattern unit of grooved blocks ready to fix. Fig. 5. Blocks fixed by tongues and grooves. Fig. 6. Blocks fixed by dowels. Fig. 7. Plan of floor where no border is required. Fig. 8. Section through three types of block. Fig. 9. Section through entire wood block flooring. Fig. 10. Blocks fixed by means of dowels, showing the order in which they are laid (herringbone floor).

length. In all cases where the property is not finished against a wall, as for instance by the hearth and the door in Fig. 7, a barrier should be putted round as a protection to the edge. When parquet is laid on an already existing floor, the door, if it opens inwards into the room, must be taken down, and a strip equal to the total thickness of the parquet is sawn on the bottom.

When the mowing has been completed, the whole surface is levelled with a smoothing plane and finished off with a steel scraper and glasspaper. If the blocks have been laid in sections comprising a complete pattern, only the junction of the several patterns will require planing, the individual sections having been tried up on the bench prior to being laid.

The usual polish for these floors is wax thinned out with turpentine, the mixture being rubbed well in and left to stand for a day before being polished with dry dusters or with a brush. In some cases a body of French polish is put on to keep the dirt from beginning the surface. Another method is oil polishing, which has the advantage of not being so liable to tread off or mark; it takes, however, a great deal of labour to keep it in a fair condition of finish.

Wood Block Floors. The laying of the thicker wood block floors entails a more elaborate process; no nails are used to fix it, the blocks being held down through the medium of a coating of mastic beneath. Fig. 8 shows sections through a few types of block, the under sides and edges being grooved in the form of a dovetail into which the mastic is forced, forming an exceedingly strong fixture. When the blocks are to be laid on a counter floor a mixture of glue and whiting is used to fix the blocks, but in other work a mixture of pitch and coal tar is often used.

Fig. 9 shows a section through the flooring. A bed of concrete about 6 in. to 1 ft. in

thickness is first put down and allowed to harden thoroughly. It is essential that this should be completely dry, as otherwise the moisture will cause the woodwork to swell. This bedding is levelled by floating a coat of cement over the top, and is again left to set,

the time varying according to the weather. In some cases a series of plugs are floated in the concrete level with the surface of cement at a distance of about 6 ft. apart.

Fig. 9, and to these the blocks are screwed. The lower sketch in Fig. 8 shows a method of interlocking the blocks with tongues fitting into grooves cut in the side of the blocks. Another system is that in Fig. 10, in which the same result is obtained by dowels. When laying the blocks the latter are stacked in a handy pile, and a small portion of the floor boarded round to keep the mastic in bounds and to prevent it from spreading over too large an area at a time.

The mastic is then poured within the space at boiling heat and the blocks quickly rubbed in position, having been first dipped in the mastic up to about half their thickness. The size of the area boarded off will vary according to the number of men engaged on the task, two men being able to tackle an area of about 2 yards. Fig. 10 shows a herringbone floor, the blocks being numbered to show the order in which they are laid. When the work has been completed it should be left to set for a few days, and is then levelled off.

Making Wood Blocks. The amateur can readily construct a wood block floor covering from strip material. This may be oak or any other ornamental wood, or it may be ordinary builder's deal of the kind sold as door stopping and known as 4 in. by 1 in., but which actually measures 3 1/4 in. wide and 5/8 in. thick. It is cut to lengths of 11 1/4 in., the length of the strip must be exactly equal to three times its width. If some other width material is used the length should be adjusted accordingly. It is important that the stuff should be uniform in width and thickness. The timber merchant will thickness the strips, and plane them on three surfaces. If the whole supply is bought at one time the wood can be put through the machine without altering the gauges, so that uniformity is assured. Suitable oak strips, 1 in. by 1 in., may be procured from any good supplier of woodwork and turnery materials.

If the worker has a lathe with a saw table attachment, or a small trolley saw table,



Parquet. Simple wood block flooring which the home worker can prepare. Fig. 11. Cutting strip to length with a sawing guide. Fig. 12. Planing the ends of the blocks. Fig. 13. Testing for length with a simple gauge. Fig. 14. Laying and fitting the blocks. Fig. 15. Corner of floor when completed.

the work of cross-cutting the strips to size will be greatly reduced. Failing this, a simple sawing gauge should first be made, such as that illustrated in Fig. 11. This comprises a base-board constructed from 9 in. by 1 in. deal. At the left hand end a cross batten is secured by screws. Two tapering upright pieces are screwed to the sides of the board, and a vertical saw cut made through them exactly $11\frac{1}{8}$ in. from the inside edge of batten. The extra $\frac{1}{8}$ in. is provided to allow of the end grain of the material being planed up.

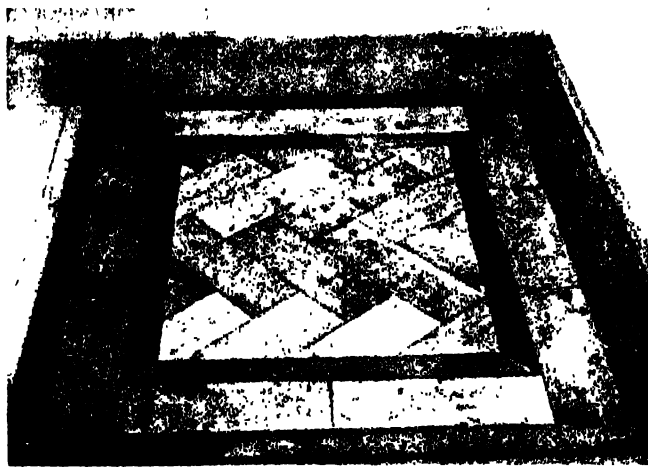
A few pieces only should be cut out at the start, and the ends planed by the use of an ordinary shooting jack, as in Fig. 12. A smoothing plane or jack plane may be used. To ensure all the pieces of timber being of uniform length, they should be inserted into a gauge, as in Fig. 13, comprising a wooden baseboard to which cross pieces of batten are fitted to either end, the space between the inner faces being exactly $11\frac{1}{8}$ in.

Having prepared a few lengths in this way, they should be tested by laying three of them side by side and placing a fourth at right angles across them. The ends of the cross piece should exactly coincide with the outer sides of the three pieces. Should there be any variation, adjustment should be made accordingly until the length is exactly three times the breadth. This having been determined, the necessary number of blocks may be prepared. If it is desired to stain them, this can be done before commencing to lay the blocks, as the colour effect is better than if the blocks are stained after they are in position.

Forming the Pattern

The next step is to determine the pattern. Generally the blocks can be laid direct on the floor boards, provided the latter are reasonably level and sound. They may be attached by gluing the underside of the blocks and further secured by secret nailing. A long strip of stopping equal in thickness to the blocks and about 2 in. broad is fitted all around the walls, butting against the skirting board. If the latter is unequal, or displaced, the stopping should be accurately scribed to fit, so that when secured in its place the narrow strip of wood will fit tightly against the skirting and present a perfectly straight lining on the other side: the object is to provide a good working surface against which to build the blocks.

Fundamentally, all wood block floors are laid on geometrical lines, and consequently they must start on some straight line, and anything in the nature of curved work is practically impossible. Having prepared the strips for a sufficient area for the room, and glued and bradded them to the floor, the blocks may be laid in position as in Fig. 14. They are laid one after the other, so that the second row overlaps the first by the width of one block. A fair number of blocks should be laid, commencing with one corner, before they are glued, just to get an idea of their arrangement and the way in which they are to be placed, after which they may be drawn aside and glued and bradded to the floor. In this case 1 in. oval brads will be strong enough for the purpose, they are driven diagonally through the edge of the block, the heads of the nails being punched into the wood.



Parquet. Fig. 14. Wood block flooring, showing good effect resulting from dark-coloured stringing and centre panel in herringbone blocks.

The work proceeds in the same manner until the opposite corner is reached, but as it is possible that the distance to be covered will not be an exact multiple of the lengths of the blocks, it is best to lay one complete row and ascertain whether they will fit exactly, or whether some of them must be cut specially. There are several ways of dealing with the problem. In some the blocks are laid from corner to corner, and the corners or specially cut pieces fitted about the middle of the room. In others the fit is arranged in the most inconspicuous corner, or at some other part of the room—as, for example, where the chimney breast or other projections intercept the natural run of the blocks. The blocks should be driven up closely into contact with a mallet. The result of laying them thus is shown in Fig. 15.

Good results are obtained by the use of strips of darker coloured wood, inserted in the form of a framework or border. Fig. 16 represents a small panel such as might be needed in a recess, or at the entrance to a room. Alternatively, a series of such patterns can be laid over the whole area of the floor. The method of laying these follows the same lines, already indicated, and comprises an outer string, or framework, and then a row of blocks, followed by a second string. The panel is filled in with other blocks laid in a herringbone pattern. To complete this, the ends of the blocks are cut to an angle, and other small angular pieces cut and fitted to fill up the odd spaces. If the proportions are carefully arranged, these special cut blocks will be few in number, but they add to rather than detract from the appearance of the job when finished. If it is desired to fit the blocks without any angular cutting, another pattern than the herringbone must be used.

It will be found best to make a large-scale drawing showing the arrangement of the blocks, or to lay them out on the floor before commencing the actual work, as often a slight modification in the size and proportion will enable blocks to be used without cutting them specially to fit.

Where the floor is very uneven the blocks may be bedded in mastic cement, or superimposed on thin felt paper, such as is used under linoleum. It should be a hard variety that will not yield unduly, as if it does the blocks might

be displaced. A little care in laying them, and especially in the nailing, will result in a satisfactory job. Such a floor covering is extremely attractive in appearance, has the merits of being durable, and is by no means expensive when made up in the manner suggested.

PARRISH'S FOOD. The compound syrup of iron phosphate, B.P.C., that is known also as chemical food or Parrish's syrup, is one of the most useful tonics for children who are weak and anaemic and have lost appetite. The dose for an adult is $\frac{1}{2}$ to 2 drams, and that for a child can be calculated according to the rule given in the article on dosage. Parrish's food is often given in combination with cod liver oil. See Dosage.

PARROT. The method of keeping the bird upon a perch, with a long, light chain attached to the leg, is better than the small cage, for it enables the bird to move freely, to descend to the floor and to stretch its wings. Such a perch may, in fine weather, be transferred to the garden, and if on such occasions the chain can be attached to the branch of a tree so much the better. Indoors the length of the chain must not permit the bird to reach any of the furniture, or the latter will be spoiled by the powerful beak.

The Cage. In any case a cage must be provided for sleeping, and the perches should be of two thicknesses, one about $\frac{1}{2}$ in. and the other $\frac{1}{4}$ in. in diameter. The best cage is the large square metal one, with a tray floor which can be withdrawn for cleaning. The tray should be covered thickly with dried garden mould, which is better than sand, and there should be a block or thick stick of soft, unsplinterable wood to engage the bird's bill. Water for drinking ought not to be kept in the cage; it should be given morning and evening, and then withdrawn. The bath should be provided daily outside the cage, if the bird objects to a wet bath, a pan of dusty earth may take its place, and will be used for dusting the plumage.

Food. Food must be varied, and no meat or meat products should be given. Hemp and Canary seed may be offered, and to these may be added sunflower, maize and oats. The bird will show a marked preference for one or more of these, and an objection to, or at least a distaste for, some others. The favoured food should be adopted for its staple rations. Nuts should be added as their seasons come round: filberts, Brazil, walnut, chestnut, or a slice of coconut, with an occasional apple, pear, orange, banana, a few dates or a raw carrot. A dry biscuit or an un buttered crust of bread may be given at times, also a knob of sugar.

Coarse sand or fine gravel must be provided from which the parrot will select



Parrot. Left, bird of dove-grey plumage, with pink tail, one of the best talkers. Right, red and blue macaw.

W. S. HERRIDGE, F.R.S.

grains for furnishing its gizzard, without which birds cannot assimilate their food.

It is important to notice the effect of the various foods on the parrot's health. Certain foods may be found to produce diarrhoea, others constipation. Either conditions will be mitigated by at once giving a few drops of castor oil floated on the drinking water, and the bill of fare should be amended accordingly. The suspected food may not be a harmful one, but its proportions may need reducing. An unsuitable position for the cage may cause catarrh, bronchitis or inflammation of the lungs. A large percentage of parrots die soon after their arrival, as the result of the unsuitable conditions of the voyage, and, therefore, if possible, a bird should only be purchased when it is known to have been in Great Britain for several months.

Indigestion is probably caused by a lack of grit in the gizzard. Yawning and distaste for food indicate biliousness and may be put right by a pinch of carbonate of soda in the drinking water for two or three days. A fit of giddiness may be the result of indigestion and the castor oil treatment may dispose of it. If not, it may be due to the presence of intestinal worms, for whose ejection a little scraped areca nut should be given. In the case of catarrh, five or six drops of tincture of aconite in water will abate the symptoms. Feather plucking is due usually to the presence of parasites under the plumage, which should be treated with pyrethrum powder.

The most popular bird, undoubtedly, is the African grey or ash coloured parrot, which holds the premier position for its linguistic attainments and its general good qualities.

Between 1930 and 1932 the importation of parrots into the U.K. was prohibited, because of so called parrot disease. See Psittacosis.

PARROT TULIP. This variety of tulip has curiously cut or lacinated petals to its flowers, which are vivid and of many hues, like the plumage of the parrot. See Tulip.

PARSLEY: How to Grow. This herb is in great demand for garnishing purposes. It is raised from seeds sown out of doors in April and again towards the end of July;

towel. Now chop it with a sharp knife or chopper. When fine enough place on a clean towel and hold the parsley under the tap squeezing the towel, until the water runs away green. Wring dry in a dry cloth, and use. When parsley is being used for seasoning, care should be taken that too much is not used as its flavour is extremely penetrating.



Parsnip. Fine specimens of a root vegetable of considerable food value

Fried parsley is used for garnishing certain hot dishes. After the parsley has been picked, washed and dried well, it should be put in a wire basket and fried in hot fat for about 1 min. It should then be quite crisp. If stored in an airtight tin, fried parsley can be kept for some days. To dry parsley for winter use, it should be picked during May, June or July, on a dry day. After well washing, strip the leaf off the stalk and dry it in a moderate oven until crisp. Rub it with the hands into a powder, and sieve. Store it in airtight bottles, which should be labelled.

Parsley can be preserved whole by washing and then plunging it into salted boiling water for 2 min. Let it then drain on the hot plate of the stove or in the oven, and when quite dry store it in an airtight bottle in a dry place. Before using, soak it for a few minutes in warm water.

Parsley Sauce. To make good parsley sauce, use a tablespoonful each of chopped parsley, margarine, and flour, and $\frac{1}{2}$ pint of liquid, which can be either fish stock, milk, or equal quantities of each.

Dissolve the margarine in a small sauce-pan, and stir in the flour. Cook for 2 min., then add the liquid, and stir until it boils. Season to taste, and add the parsley. Do not let the parsley boil in the sauce or its colour will be spoiled. See Cod; Fish.

PARSLEY FERN. This is the popular name of *All-sorus crispus*, a hardy fern, 6 in. or so high. It is suitable for planting in shady crevices in the rock garden or dry wall in a compost of loam, peat and sand.

PARSNIP. This invaluable hardy root-vegetable is in season from late autumn until early spring. It is raised from seeds sown in March-April in deeply dug land free from fresh manure;

friable soil which the roots can penetrate easily is required. The most economical practice is to sow groups of three or four seeds at 9 in. intervals along the drill: only one seedling must be left in each group. The drills should be about an inch deep. Alternatively seeds may be sown thinly along the drill and the seedlings thinned to 9 in. apart.

During the summer months the soil between the rows, which should be 15 in. apart, must be hoed frequently. In late autumn, winter and early spring the roots are dug as required. In frosty weather it is wise to cover some of the roots with straw or other protective material to prevent the ground being frozen, and thus allow the roots to be lifted. The Student is a popular variety of parsnip possessing large, long roots. Tender and True is considered to be of better flavour.

How to Cook. The root of the parsnip furnishes a valuable food which contains a large percentage of sugar. As a vegetable it can be cooked in a variety of ways, either boiled, fried, stewed, or used with other ingredients. It is cooked after the same manner as the carrot, and when boiled or stewed can be served with margarine.

To prepare parsnips for boiling, wash and scrape them clean, or peel them thinly, remove the tops, and put them into cold water. Then slice them according to size, and put them into a sauce-pan of slightly salted boiling water. Cook slowly for 1 hour, testing with a fork for tenderness. Serve with white sauce.

Fried parsnips, which are usually served with roast mutton, are prepared by first boiling them and then cutting them into strips. Dip each strip in batter or in egg and breadcrumbs and then fry in hot fat.

Creamed parsnips are made by first boiling the parsnips, cutting them into slices, and then spreading the latter with margarine. Lay them in a vegetable dish and cover with white sauce. See Carrot; Kitchen Garden.

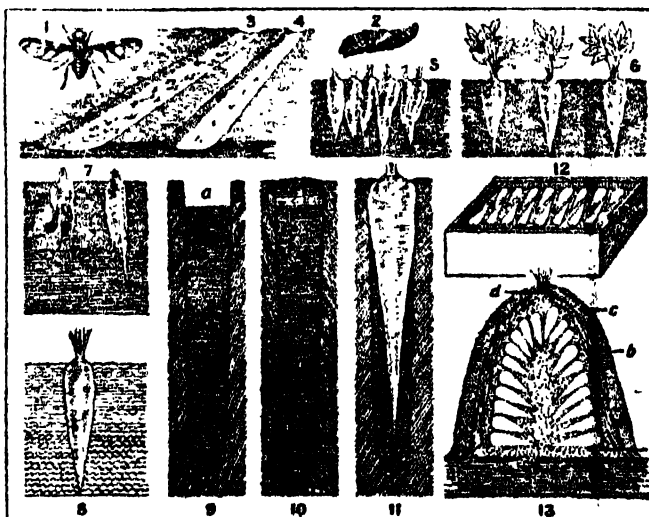


Parsley. Bunch of the early-leaved variety of this useful culinary herb

the seedlings should be thinned out till they are 6 or 8 in. apart.

As the leaves become tough and coarse, cut them off to induce fresh growth, especially when the plants show signs of beginning to flower. It may be necessary to protect parsley from frost with mats or a frame. The botanical name of parsley is *Carum petroselinum*.

Uses in Cookery. To prepare parsley to be nicely chopped for garnishing, first blanch it by washing it well and picking it free from the stalks. Put it into a pan with a little cold salted water and bring to the boil. Strain off the liquid and dry the parsley in a



Parsnip Growing. 1 and 2. Parsnip fly and larva. 3 and 4. Wasteful sowing and the result. 5 and 6. Economical sowing and its produce. 7. Misshapen roots through shallow sowing and obstructions. 8. Result of deep digging and no manure. 9-11. Exhibition parsnips: 9. Crowbar holes filled with fine soil (a). 10. Seeds sown. 11. Seedling root. 12. Storing in box of sand. 13. Storing in clamp: a, sand; b, straw; c, earth; d, vents.

Partan. In Scotland the crab is called a partan, and crab sauce is known as partan sauce. See Crab.

PARTERRE. Used in connexion with gardens, a parterre is a formal arrangement of flower beds with walks of turf or gravel between. See Garden; Italian Garden.

PARTITION: How to Erect. An internal wall that divides a room into two compartments is known as a partition. When built of ordinary bricks laid with a simple bond such a partition is fireproof and practically soundproof. Another method is to build it of coke breeze blocks, bedding these in cement mortar.

With the foregoing materials a firm foundation has to be provided. In most cases, where the partition is in the nature of an addition to

or any of the patent wall or building boards. The timber is fixed to the floor, uprights erected around the doorway openings, and the other studs spaced so that an upright is available for supporting the edges of each of the sheets. For example, if the wall boards are 4 ft. wide, the studs may be spaced about 2 ft. centres, three of them being available for the support of one sheet. This saves cutting the sheets to waste, and also obviates the need of fitting extra studs.

The studs should be not less than 3 in. wide and 2 in. thick, and should be supported by uniform braces nailed between them, or jointed with a halving joint or some similar simple joint. Both sides of the work are finished up smooth and level, and consequently all the studs should be of the same thickness to provide a level surface whereon to nail the wall board. One side is fixed first, and then the other side, and the joints covered with strips of wood moulding to form panels, or finished in any desired manner. The result is a very light partition, which is both easily constructed and fairly soundproof.

With some of the patent boards, of which several are obtainable, the makers advise that the edges should not be nailed, or that one edge only in each direction should be nailed. A gap of about $\frac{1}{4}$ in. should be left between the edges of adjacent sheets, to allow for expansion and consequent movement.

If a soundproof partition is desired, a special form of building board can be obtained which has sound absorbing qualities. Other varieties are waterproofed, fitting them for external use, and these are dealt with in the article on Wall Board (q.v.).

Lath and Plaster. An excellent partition is made by making up a stud or framework as previously described and covering it with plasterers' laths nailed on with lath nails about 1 in. long and leaving a gap between each lath of $\frac{1}{2}$ in. When completed the surfaces are plastered with a pricking-up coat and the whole brought to a fine and true surface with a hard plaster.

The advantage of this type of partition is that the surface is perfectly smooth and can be worked into any existing wall arrangements. The doorway should be finished with an architrave, and such items as the skirting board, picture rail and so forth, can easily be matched up to the existing work and continued across the partition at the same levels. A partition made in this way should not normally be distempered or papered until at least six months after it has been built, as it may spoil the distemper and discolour the paper. There are compositions available which are claimed to overcome this difficulty, and can be used on practically wet plaster. One of these may be used if it is imperative to complete the decoration very quickly.

A point to be noted with all partitions is they should be fitted into the existing walls as strongly as possible. In the case of the stud partition, that is, one made of wooden uprights, the uprights should be securely spiked to the wall, taking care to set it up perfectly plumb and true with the aid of a plumb bob and line, or with a plumb rule.

In the case of a partition made of

brick to be bonded into a wall of similar material, the plaster should be cut away closely and neatly. If the existing walls are 9 in. thick, a few of the stretchers may be cut out about every 2 ft. apart and the new work bonded into the existing work by setting the brick halfway into the existing wall from which the stretcher has been removed and half in the partition wall. When coke breeze blocks are used, short stout pieces of iron may be embedded between the bricks of the existing wall and set on the top of the breeze blocks.

The amateur should obtain expert advice before interfering in any way with the walls or principal timbers of the house. Apart from considerations of safety, such an operation may be contrary to provisions of a lease or tenancy agreement, or may need approval by a local authority.

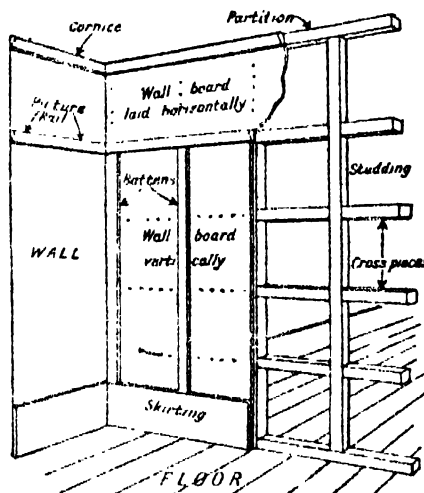
PARTRIDGE: How to Cook. For some dishes old birds may be used, but for roasting or broiling they must be young. The flesh of the young birds is easily digested, and is most suitable for invalids, and is highly nutritious.

To distinguish the age of the birds it is necessary, when purchasing, to examine the bills and the pinions, also to notice the colour of the legs. If they are young, the bill will be of a dark tint, and the legs will be yellow, while the flesh of the pinions will be tender when pressed, and the long wing feathers will be pointed. If old, the bills will be whitish, the legs blue, and the long wing feathers rounded. If stale, the vent has a greenish appearance. At the present day game is eaten much fresher than formerly, but partridge should always hang for at least a week.

General rules for cooking partridges and for making pies, puddings, or entrées from these birds are the same as for other game, and will be found under that heading in page 502.

Cooking with Cabbage. One of the most tasty methods of cooking partridge is to stew with cabbage. Savoy cabbage is best, as it seems to impart a peculiarly agreeable flavour to the birds. Prepare and truss a brace of partridges, and fry them in a stewpan with 4 rashers of bacon and 1 oz. margarine, then add 1 gill stock. Have ready a savoy cabbage well washed and drained. Cut it into shreds, put it in the stewpan with the partridges, and stew for 1 hour, turning the birds occasionally. To serve, dish the rashers and lay the partridge on them, and arrange the cabbage and liquor round the dish.

Another way of cooking these birds with cabbage is to roast them for 10 min. and then cut them into neat pieces. Grease a plain charlotte mould, about a 3-pint size will do, and cover the bottom with a layer of savoy cabbage which has been cooked, pressed



Partition. Diagram of portion of wall, showing wall boards nailed on cross pieces and studding.

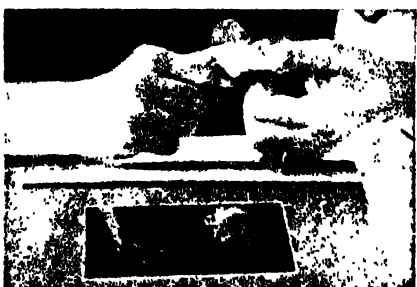
an existing building, the only practical plan is to take a piece of stout timber, preferably oak, equal in breadth to that of the building bricks or blocks. In the case of bricks, this may be reckoned as $4\frac{1}{2}$ in.; for coke breeze blocks or slabs allow 2 $\frac{1}{2}$ to 3 in. The timber should be continuous from one side of the outer wall to the other. Alternatively it should extend for the whole length of the new partition, and should be placed in position regardless of any doorway that it may be intended to provide in the partition wall.

The opening wall, in any case, have to be made up of a framework consisting of uprights of timber at least as wide as the thickness of the intended partition, and 2 in. or more in thickness. These should be mortised and tenoned into the floor plate, provided with a head or cross piece, as for example at the top of the door, and built into a plate, or piece of timber forming the top of the partition. In some cases the uprights may be joined to existing woodwork, such as ceiling joists. The essential point is to provide continuous uprights from the floor to the ceiling level, or some other strong support at the top. The continuous floor plate tends to keep the partition in line, and after the partition is up it is quite simple to cut away the unwanted piece at the bottom of the doorway opening. The wall is then erected on the top of the floor plate, built up to the framing around the door or any other openings, and continued to the top. The surfaces must be rendered with cement or worked up to a good face with a rough coat of plaster known as a pricking up coat, and finished with a fine or setting coat. The door is then hinged in the opening and finished in the usual way.

Use of Wall Board. A much simpler partition can be made up with timber framing, covered with asbestos cement sheet, plywood,



Partition. Attic bedroom paneled in wall board.



Passe Partout. The raised framing of a picture. Fig. 1. The cardboard backing is pierced with holes for hangers. Fig. 2. Two lengths of cardboard strips are cut off to the exact length of the glass. Fig. 3. A piece of gold passe-partout binding $\frac{1}{4}$ in. longer than the cardboard strip is cut off, moistened and laid on, being firmly pressed down with a bone creaser. Fig. 4. The binding is applied lightly to the two covered strips and they are then placed in position on the glass exactly level with the edge.

Courtesy of Dennison Manufacturing Co., Ltd.

seasoned and softened with margarine. Place on the prepared cabbage a layer of pieces of partridge and fill up the cavities with cabbage to ensure an even surface. Lay over the partridge a thin slice of pickled pork, add the remainder of the bird, and over that the rest of the cabbage, press all well down into the mould, and tie over the top a stout piece of greased paper. Put the chattronne into a moderate oven for from 15 to 20 min., taking care that it does not brown. When cooked turn it over on to a hot dish, lift up the mould and serve with a rich brown gravy.

Braising. To braise partridges, prepare 2 or 3 birds as for roasting, with bacon tied over the breasts, and put them in a casserole with 1 oz. margarine. Moisten with 1 pint good stock and (if desired) a wineglassful port or madeira, then season, add a bouquet garni, and close the casserole tightly down by laying a greased paper over the top underneath the lid. Cook gently in a moderate oven till the birds are tender. Serve them on a block of fried bread, and keep hot. Strain the liquor from the braise, thicken it with flour, skim it free from fat, and pour it over and round the bird. Garnish with fried button mushrooms, or any suitable dressed vegetable. If the sauce seems scanty, prepare a little extra rich brown sauce and serve it in a saucier. See *Devilling Game*. Pleasant.

PARTRIDGE BERRY. This is the popular name of a low growing hardy evergreen shrub, *Gaultheria procumbens*. It bears white flowers in spring, and red berries in autumn, and needs loamy or peaty soil and partial shade. *Gaultheria* 'hallii', 3 ft. high, is a valuable evergreen shrub, with bluish coloured flowers in spring and dark fronds later on, which is useful for planting in shady places; peat and loam should be added to the soil.

PASQUE FLOWER. This is the common name of the *Anemone pulsatilla*, a hardy plant which bears beautiful many coloured flowers in April and May. It grows about 10 in. high and flourishes in loamy soil with which lime or mortar rubble has been mixed. It likes partial shade. See *Anemone*.

PASSAGE. In the domestic sense this word is employed for the space in the house

that leads from one room to another, or from a front or back door to the rooms. It is practically covered by the articles on hall, landing, and staircase. See *Hall*, *Landing*, *Staircase*.

PASS BOOK. Account book which shows the receipts and payments of a banking account. The book is supplied by the bank to the customers, and the items are entered by the bank officials. A pass book should be sent to the bank for the latter purpose at least once a quarter. Most banks have now substituted statement sheets for pass books. See *Banking*, *Cheque*.

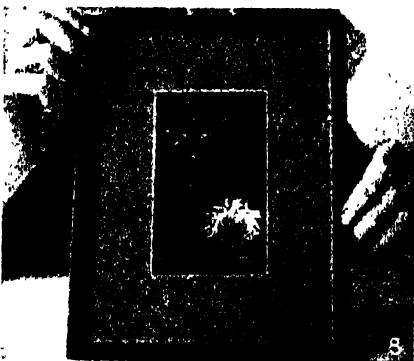
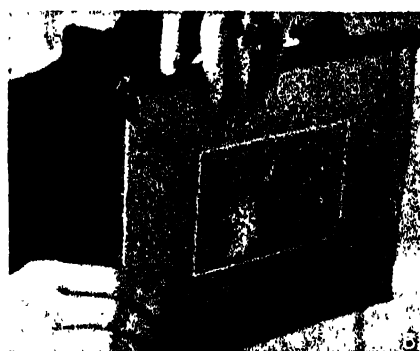


Fig. 5. Two more lengths of cardboard strips are cut to fit exactly between those glued on the glass, the ends being mitred, and the same process of glazing is followed. Fig. 6. Two pieces of binding of the chosen style are cut 1 in. longer than the picture, and laid over the inner binding about $\frac{1}{4}$ of an inch from inner edge. Picture, backing board, mount and glass are placed together and the binding brought over to the back. The corners are finished as shown. Fig. 7. Two pieces of binding the exact length of the remaining sides are cut and applied. Fig. 8. The finished picture.

Courtesy of Dennison Manufacturing Co., Ltd.

Making a Raised Frame. The passe-partout method of framing can also be applied to make a raised frame. The articles required for this include, as well as those mentioned, some strips of pasteboard, $\frac{1}{4}$ to $\frac{1}{2}$ in. wide, and 2 rolls of binding, one for the frame itself the other for a frame lining. Fix the metal hangers in the back, Fig. 1 and fasten picture, mount, and back together as described above. Cut off 2 strips of the pasteboard exactly the length of the glass, Fig. 2, and also cut off 2 pieces of gold binding $\frac{1}{2}$ in. longer, Fig. 3. Moisten the binding and cover the pasteboard with it carefully and evenly; then gum lightly the underside of the strips, Fig. 4, and fix them to the glass, level with the edges.

Two strips of cardboard must now be cut for top and bottom, to fix exactly between the side pieces, Fig. 5. These are also covered with binding so that the binding projects $\frac{1}{4}$ in. or $\frac{1}{2}$ in. at each end according to the depth of the pasteboard. These ends of binding should be cut off at an angle of 45° before the pasteboard is gummed and fixed in place on the glass. Moisten the triangular ends and fix down to neaten the corners. The passe-partout framing is then carried out as described in the earlier method, the inner binding being all but covered by the outer framing, Figs. 6 and 7. Many variations of both these methods will suggest themselves, but should not be tried until the simple passe-partout framing can be carried out easily and with perfect neatness. See Mounting.

PASSION FLOWER. The passion flower belongs to a family of climbing plants which are mostly natives of Central and Southern America. Most of them need the temperature of the hothouse, but there are two hardy sorts which are the most important. These are *Passiflora caerulea*, the beautiful blue passion flower, and its white variety, *Constance Elliott*. They will thrive in any good ordinary soil with the protection of a south or west wall. When the plants have filled the space allotted to them they should be pruned in spring; otherwise little pruning is needed.

The hothouse kinds have flowers of various rich colours. They must be potted up in the ordinary mixture of loam, leaf-mould, and silver sand, or in beds of 2 ft. wide by at least 1 ft. in depth. They can be trained up rafters or walls, and need pruning just as do the outdoor varieties. A temperature of between 60° and 70° should be maintained.

PASSOVER CAKE. The Jewish cakes are made from 1 lb. flour, $\frac{1}{2}$ teaspoonful salt, and enough cream to mix the whole to a stiff paste. Sieve the flour and salt into a basin, warm them, then stir in the cream. Roll the pastry out thinly on a floured board, then stamp it into large rounds, and cook these on a griddle over the heat. When one side begins to blister, turn the cake and cook it on the other side. Passover cakes should be crisp and of a pale brown colour, when cooked.

PASTE: Various Kinds. A paste made of flour and water is capable of joining many light articles. To make the ordinary household paste, mix 1 lb. wheaten flour with 1 oz. alum and add 4 pints of cold water, stirring all the time. Run the mixture through a sieve to ensure that no lumps remain, then transfer to a saucepan and boil for five minutes, stirring all the time. The paste will be thick, and to ensure it keeping for a few weeks add as a preservative thirty drops of oil of cloves and the same quantity of carbolic acid.

For Mounting. As an adhesive for mounting photographs it is necessary to avoid the use of acid ingredients, such as alum, as this would act on the photograph and cause it to fade. Professional photographers use freshly made starch paste, made by first mixing powdered starch with a little water to form a

paste and then adding boiling water, stirring all the time. Dextrin can be employed for an adhesive that keeps, one pound of dextrin being boiled with 25 oz. of water until it has dissolved, then, after adding 30 drops of oil of cloves as a preservative, pour into small jars for use.

For Paperhanging. Paste for paperhanging is made from 3½ lb. flour mixed with cold water to a stiff batter. A gallon of boiling water is then added, in which two tablespoonfuls of ground alum have been boiled. The top of the paste should be covered when cold with a little cold water to prevent the formation of a crust. This paste should be quite stiff, and requires thinning down with cold water before use. It should not be employed thinner than can easily be spread.

For Linoleum. A paste for linoleum is made by mixing the rye flour with cold water to a somewhat stiffer consistency, and adding boiling water. Some glue size is melted down



Passion Flower. The blue passion flower, *Passiflora caerulea*, and its white variety are suitable for planting against a sunny wall.

and added to the paste whilst both are hot. They should be well stirred and allowed to cool, when the paste will be ready for use. The more size that is used, the stronger the paste will be. Alum may be used as a preservative. In connexion with leather or strong paper mâché work, a paste which is similar to linoleum paste is prepared, but instead of employing size, powdered resin is added. Boiling should be slow, and the paste should be of the consistency of butter.

PASTE: In Jewelry. A certain colourless flint glass of the hardest and densest kind, known as vitreous paste, is used to imitate diamonds; for other stones the glass is melted with various coloured oxides. In the 18th century a Viennese, Joseph Strass, invented a fine quality of paste, which has since been known by the name of strass. It possesses almost the brilliancy of diamonds, but as this brilliancy was obtained by a greater amount of oxide of lead in its composition the paste lost some of its hardness. For the best paste jewels, the strass is cut, ground, polished and faceted with exactly the same care as are precious stones.

It is usually set with a solid backing, as the foil enhances the sparkle of the paste, but some of the finest qualities stand the test of the open setting. This is particularly the case

with coloured strass. So beautiful were the imitations of rubies, sapphires, emeralds and amethysts that in the 18th century some court jewellers preferred to carry out their creations in paste rather than real gems. With the former they could obtain a truer colour in flawless pieces of exactly the size required. With real gems the design had to be subordinated to the stones, and the matching of flawless stones of a good colour for a large ornament presented great difficulties, with emeralds almost an impossibility.

Spanish paste of this period has a great value for collectors, while French and English designs were also of great beauty. Lovely pieces were made on a background of dark blue paste with raised floral designs in diamond paste, a style mostly used in marquise rings and watches. Other beautiful pieces are the miniature frames often surmounted with scroll or ribbon paste work. In the English Georgian paste the stones were cut large and square, well faceted, and often mounted in gold, whereas the French and Spanish designers used silver.

Modern paste is either carried out in replicas of the fashionable jewels, or the old designs are copied for shoe buckles, and other ornaments. In the first case the paste is purely an imitation; in the second, it makes no pretence at being real stones, and if the designs are good it has a beauty of its own. This is especially the case with shoe buckles. The square shapes with large stones will set in straight lines show the Georgian influence, the delicate scroll and spray work, the French.

A paste composition is used to imitate turquoises successfully for fancy ornaments and also for cameos, intaglios, and Egyptian scarabs. Paste will not scratch glass as a diamond will, and a test is applied in which an aluminum pencil is drawn across the surface of a jewel to be tested; if paste, a silvery line remains, if natural stone there is no such result.

PASTEBOARD. A form of cardboard composed of layers of thin card united with paste and consolidated under pressure is known as pasteboard. It is a strong material which has many uses in the home, the use to which it is most commonly put being in making small boxes and crates for the storage or packing of goods for transit.

PASTEL PICTURE. Although less affected by damp than are water-colours, pastels should be guarded against it, by using cork disks behind the frames. The effect of fixatives, such as shellac, is always deleterious, and spraying with a diffuser or varnishing with a brush is fatal to the soft bloom of untouched crayon work. It should therefore be framed and glazed. A grey or stone coloured mount is most usually suitable, and a narrow black or brown frame should be selected. During the 18th century portrait-pastels were often executed in several media. Thus the portrait might be drawn in crayon on a landscape background in water-colour or gouache, and the detail heightened by the pencil. Mixed drawings of this kind do not bear exposure to strong light with the same impunity as pure pastel, and therefore need special care.

PASTEURISATION. This process destroys nearly all germs. By keeping milk at a temperature between 145° F. and 150° F. for not less than half an hour it becomes pasteurised. The milk may be in bottles which are put into a saucepan or a special container, or a double saucepan may be used. At dairies which are authorised to supply certified pasteurised milk an approved apparatus must be used. It is to be noted that children fed on pasteurised milk should be given a teaspoonful of grape or orange juice once or twice every day. See Baby; Diet; Milk.

PASTRY FOR PIES, TARTS AND PATTIES

Popular Recipes for Plain and Rich Varieties

Under this heading are included the ordinary pastries. Fancy kinds such as Genoese and Flan pastry are given under their respective headings. See also entries on the various pies and tarts, e.g. Apple Pie; Apricot Tart; Griblet Pie; and those on Banbury Cake; Cheese Cake; Cream Bun; Patty; etc.

Pastry consists of a preparation of flour, fat and water with the occasional addition of baking powder, eggs, sugar, and lemon juice. The proportion of fat to flour and the methods in which they are mixed make the difference between one kind of pastry and another.

Flaky pastry is intended principally for covering meat pies, mince pies, sausage rolls, etc., and sometimes for covered fruit pies. But both flaky and puff pastry are often used to make light fancy cakes with fillings of jam or cream or currants, such as the cases of Banbury cakes, Vanilla cream sheets, jam puffs or patties. Short pastry is used for fruit tarts, jam tarts and tartlets, or any sweet pudding where a soft mixture is baked in a pastry lined dish. Hot water pastry makes the correct crust for raised pies, and choux pastry is necessary for éclairs.

Two rules must be borne in mind for successful pastry making. Everything must be as cold as possible, except in the case of hot water crust and the fancy pastries, which are in a class to themselves, and the pastry must be handled as little and as lightly as possible.

An ordinary plain rolling pin is best, not one with revolving handles. The glass rolling pins that can be filled with cold water are excellent for pastry. A slab of marble or plate glass or a table with an enamelled metal top is better than a wooden pastry board for rolling out the pastry. All baking tins should be thick or they will warp and spoil the shape of small pastries. A thick tin also prevents burning at the bottom of mince pies or patties.

The best white flour should always be used, and this must be quite dry and cold, and sieved before use. Use a knife for mixing as much as possible, then use the finger tips to finish. Work away from the heat, and keep the hands as cool as possible. Margarine alone is not entirely satisfactory for pastry; the oil in it tends to make the pastry hard and dry. Good lard alone is best for plain pastry, or a mixture of lard and margarine can be used. Butter is ideal for puff pastry; in its absence, one can use lard and margarine mixed.

The pastry must be mixed to a soft dough that leaves the sides of the bowl clean. It is impossible to give the exact amount of water required as flours vary in texture. If the pastry is too wet or too dry it will be tough when baked. Use as little flour as possible when rolling out, as too much spoils its appearance when cooked. Do not press heavily when rolling, but use short, firm strokes. Get the pastry to an even thickness, the edges must not be thinner than the rest.

Much good pastry is ruined in baking. A hot oven must be used for ordinary pastry (375 to 380 degrees) and for puff pastry a very hot oven (400 degrees). Otherwise the fat will liquefy before the starch cells in the flour have burst to absorb it, and the pastry will be heavy and oily. Cold air and sudden draught will cause the pastry to fall and be heavy. The oven door should not be opened until the pastry has had time to get well oven and set. Uncooked pastry will keep fresh for several days if wrapped in greaseproof paper and kept in a cool place. Patty or tartlet tins or pie dishes do not need greasing when good pastry is used, as it contains sufficient fat to prevent sticking.

Short Pastry. The ingredients required for this are $\frac{1}{2}$ lb. flour, 4 oz. lard, $\frac{1}{4}$ teaspoonful salt, $\frac{1}{4}$ teaspoonful baking powder, and cold water to mix. Rub the lard into the flour until it looks like breadcrumbs. Add the dry ingre-

dients and mix well. Mix stiffly with cold water, using a knife. Work lightly with the fingers until smooth, using a little more water or flour until it is quite pliable. Roll out at once on a floured board and use as required.

Flaky Pastry. A good recipe for flaky pastry needs the following ingredients and method of making. Take $\frac{1}{2}$ lb. flour, 6 oz. lard and margarine mixed, $\frac{1}{4}$ teaspoonful salt, a squeeze of lemon juice, cold water. Mix flour and salt in a basin. Divide the fat into four portions, and rub one portion into the flour. Mix to an elastic dough with lemon juice and water. Roll into an oblong strip on a floured board. Flake one portion of the fat down two-thirds of the pastry, leaving the third portion nearest without fat on it. Fold in three from the lower end. Give one-half turn so that open edges are opposite, press these edges lightly with rolling pin to close them, roll out to an oblong the same as before. Repeat the process until all the fat is worked in, fold up the pastry and set aside for an hour. Roll out once more (five times in all), cut to required shape and use. Brush with beaten egg and bake in a hot oven. A larger proportion of fat to flour is used for flaky pastry, but no baking powder is necessary.

Puff Pastry. To make this rich pastry take $\frac{1}{2}$ lb. flour, $\frac{1}{2}$ lb. butter, $\frac{1}{4}$ teaspoonful lemon juice, $\frac{1}{4}$ teaspoonful salt, cold water. Press the butter to an even oblong shape in a floured cloth. Rub a small piece of the butter into the flour, add the salt. Mix to an elastic consistency with the lemon juice and water, and work lightly until smooth. Roll out into a square, not too thin. Put the square pat of butter into the centre of the pastry and fold it over, so that there is a parcel of butter wrapped up in pastry. Roll out into a long strip, press gently at first with the rolling pin so that the butter is gradually absorbed into the pastry. Fold in three and roll out again, keeping the open ends to and from you while rolling. Fold and roll out again, then set aside in a cool place for an hour. Roll out twice more and set aside again. Then roll out twice more (folding pastry between each time) and use. Puff pastry should be rolled out seven times in all.

Rough Puff Pastry. This is really a simpler form of puff pastry, requiring less rolling, and less shortening is used. Take $\frac{1}{2}$ lb. flour, 6 oz. lard and margarine mixed, $\frac{1}{4}$ teaspoonful salt, squeeze of lemon juice, cold water. Mix the flour and salt, cut the shortening into pieces the size of a walnut and mix them into the flour. Mix to an elastic dough with the lemon juice and cold water. Turn on to a floured board and knead lightly and quickly until smooth and of an even texture. Roll out and fold four times. Stand aside in a cool place for an hour or longer, then roll out and use. Bake in a hot oven.

Hot Water Crust. Contrary to the general rules for making pastry, this paste must be made in a warm atmosphere, and it should never be allowed to get very cool. The ingredients required are $\frac{1}{2}$ lb. flour, $\frac{1}{2}$ lb. lard, 1 egg yolk, $\frac{1}{4}$ teaspoonful salt, about a gill of milk and water. Add salt to flour. Put milk and water and lard in a saucepan and bring to the boil. Add egg yolk to flour, stir in the liquid and mix with a knife until smooth. Leave it, covered with a cloth, in a warm place for an hour or so, then knead it for about ten minutes. Keep warm and use for raised pies as required.

Choux Pastry. This delicate type of pastry is used for making cream buns and éclairs.

A good recipe requires 1 oz. sugar, 3 oz. butter, 6 oz. flour, 3 eggs, a few drops of vanilla, $\frac{1}{2}$ pint water. Put into a saucepan over the fire the sugar, butter and $\frac{1}{2}$ pint water. When these are boiling, stir in the flour quickly, beating the mixture till smooth and cooking it till it leaves the sides of the pan clear. Then take it from the fire, let its contents cool slightly before beating in the eggs, one at a time, and flavour the whole with the vanilla. Spread the mixture on a plate to cool before using it and then bake in a slow oven till it is pale brown in colour.

Pastry Brush. Pastry brushes are used for greasing baking tins and applying raw egg and other coatings for pastry. They are made of white French bristle of various lengths in metal bands or socket handles. For those used in grease it is essential they should not depend entirely on cement to hold the bristles together. Only substances will penetrate to the roots of the bristles, with the result that loose hairs come out in use. There are various patent or machine-made brushes which claim to be indestructible, and as pressure is employed as an additional security in these, they are to be preferred to ordinary cement-set brushes.

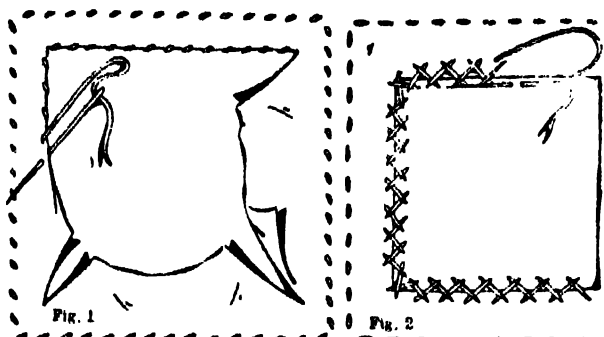
As in the case with all utensils used in the preparation of food, care is necessary to ensure that the brushes are kept clean. Apart from dust and particles of the ingredients used that may adhere to a sticky brush, grease remaining round the roots of the bristles will turn sour, and if in contact with a metal band will produce verdigris. The brush should be thoroughly washed out in a cup of hot water on every occasion after use. Brushes used for egg should not be put into hot water, as it sets the egg. Stand the brush in a jar filled with cold water and rinse under running tap.

PASTY. Every kind of meat, fish, or fruit that is enclosed entirely in pastry is called a pasty, if baked without the aid of a tin or dish other than the baking sheet on which it is laid. The shape is immaterial, but usually it takes the form of a half circle. Pasties make a useful variety of meat pie, especially for picnic open air luncheons, as knives and forks need not be carried for service.

The pasty is an economical method of using up odd pieces of pastry left over from pie-making. A plain short crust is most suitable, and the meat or fruit must be cut fine, and well seasoned or flavoured. If the pasty is to be filled with jam or fruit, take care that this is placed right in the centre of the round, so that when the paste is folded over the jam or fruit juice does not escape through the edges. These should be moistened and well pressed together. See Apple Turnover; Cornish Pastry.

PATCHESI. This indoor game is a variant of the race game. It is played by four persons. The board is arranged with the part in which the play takes place in the form of a Greek cross with the home or goal in the centre. The only other implements required are dice. Each player has one arm of the cross, which is divided into squares arranged in three rows, and three counters, which he moves over the squares in accordance with his throws of the dice. Each player must first move his men along one of the outer rows towards the centre, then back along the other outer row, and finally down the centre row to the goal. The one who reaches this first wins the game. See Race Game.

PATCHING. The method used for patching depends upon the article to be patched. Usually a patch is sewn on the wrong side, but one made of printed material is best put on the right side. If the patch is to form one with the garment, care must be taken that the pattern matches and does

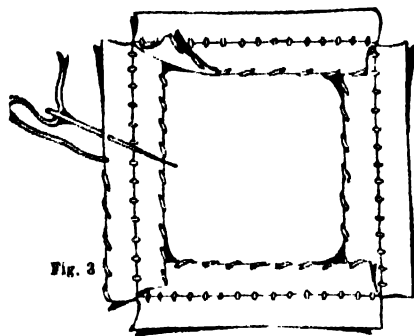


not break up the surface. This result would obviously be difficult to obtain if the patch were put on the wrong side of the material.

To mend calico articles cut a patch a little larger than the hole and the worn part round it, and turn down a narrow fold all round on the right side. Place this on the wrong side of the garment, arranging it so that the folds will be inside and the hole in the centre. Pin it in place, tack it all round and then hem it down, taking extra care at the corners (Fig. 1). Pull out the tacking stitches, turn to the right side of the garment and slip the scissors into the hole, cutting it diagonally to within about $\frac{1}{4}$ in. of each corner (Fig. 1). Cut out the worn portion, leaving a narrow edge of uniform width all round; turn this edge in and sew it down neatly. The patch is then finished, and only needs to be pressed with a warm iron.

When patching flannel, the right and wrong sides of the material should be determined, the former being the more fully. Each side should be cut straight enough to keep it to the same thread, and herringbone stitch is used for sewing the patch (Fig. 2). Fig. 3 shows a good method for thick materials. Lay the patch on the garment, making it $\frac{1}{4}$ in. larger all round than the hole. Turn in and tack a single hem, $\frac{1}{4}$ in. deep, all round the

wrong side of the hole and a similar one round the wrong side of the patch. Fit the patch into the hole and overcast them together. Overcast the raw edges to prevent the patch fraying, and then press the patch well on the right side. For very fine work a darned-in patch is the best. The patch



Patching. Fig. 1. Right side of calico sheet, showing hemming and arrangement of corners. Fig. 2. Herringbone stitch used in patching flannel. Fig. 3. Overcasting edge to prevent fraying when patching thick material.

must fit right into the hole and the edges be darned together. See Darning, Mending.

PATCHOULI PLANT. This name is given to one of the varieties of the green-house foliage plant *Coleus*, most of which are grown for their begonia-like leaves and then value as summer bedding-out plants. *C. aromaticus* has a leaf, however, from which a one time favourite perfume was obtained.

PATCHWORK AND ITS DECORATIVE USES

Ornamental Designs with Scraps of Silk, Leather, Lace and Paper

The reader is referred to the articles on Applique and Embroidery for the stitches used in patch work. See also Cushion; Lace; Leather Work; Paste; Picture; Poilife.

Patchwork with a suitable assortment of colours and materials and a skilful method of assembling and joining the pieces can be raised to the level of an applied art if a good design is first originated, or copied, and the requisite patches are cut and joined to carry out the definite pattern or pictorial effect selected. The materials cost practically nothing, but the results can be richly decorative.

Designs must have suitable relation to the objects to be made or partially covered with patchwork. They must also be chosen with regard to the materials that the worker wishes to utilize. It is a mistake to mix patches of heavy weight with thin fabrics; the pieces should be of average substance throughout the work. For instance, leather and stout cloth, velours or velvet, may be used together, and a simple geometrical design should be chosen for their patchwork; silks, satins and light-weight velvets should be assembled for more intricate designs in which fancy stitchery may play an important part; lace should be mixed only with net or openwork embroideries such as *Broderie Anglaise*; paper patchwork must be entirely of paper, though this may be tinselled or of any colour required by the design.

The completed piece of patchwork made from woven fabrics or leather usually requires to be backed or lined with a suitably strong piece of material. As paste is employed to assemble paper patches on to cardboard or strong cartridge or parchment paper, it is

necessary to provide a background when the design is completed.

Leather and Velvet Patchwork. Ornamental and durable accessories for the home can be made from patches of coloured leathers or from mixing these with other suitable materials. Floor cushions and pouffes, sofa cushions for lounge or dining room, and pyjama cases are among the best articles on which to use leather patchwork. Cuttings from leatherwork should be saved or can be purchased cheaply. A good effect is obtained by working light and dark brown leathers in parquetry patterns. Harlequin patterns of diamond-shaped pieces also look well in three or more shades. Details about cutting leather, sewing and thonging are given in the article on Leather Work. Thonging can be employed for joining larger patches of stout leathers and for making an edging to a cushion or pouffe.

Round leather cushions for ears and cloth floor cushions in contrasting colours may be adapted to patchwork of leather, velvet and cloth pieces;

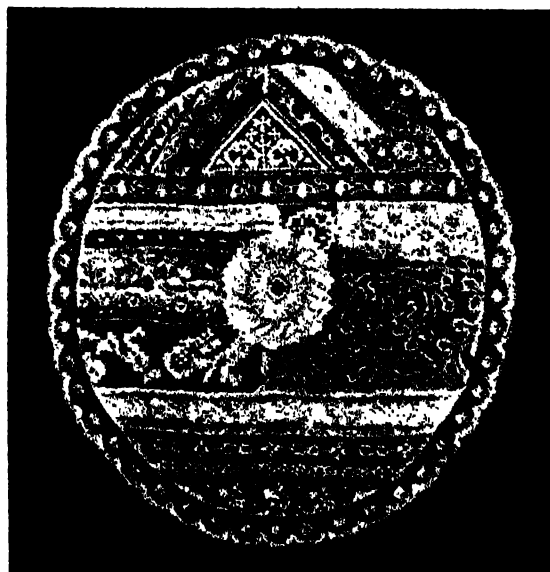
whilst the bolster-cushion design mentioned in p. 332 could be adapted to smaller scraps of velvet, by making the wide stripes narrower or by changing the colour half way round in each case. Care must be taken not to employ too many colours and to balance any change by a corresponding change in the other stripes.

In this style of patchwork patterned materials are hardly ever successful in combination with plain scraps. The only exception would be in the case of some very boldly designed piece of velvet in which the pattern made a distinct motif which could be utilized as a central piece in the same way that a marquetry panel decorates inlay. Linoleum, tiles and inlaid wood all may offer useful suggestions for geometrical patterns.

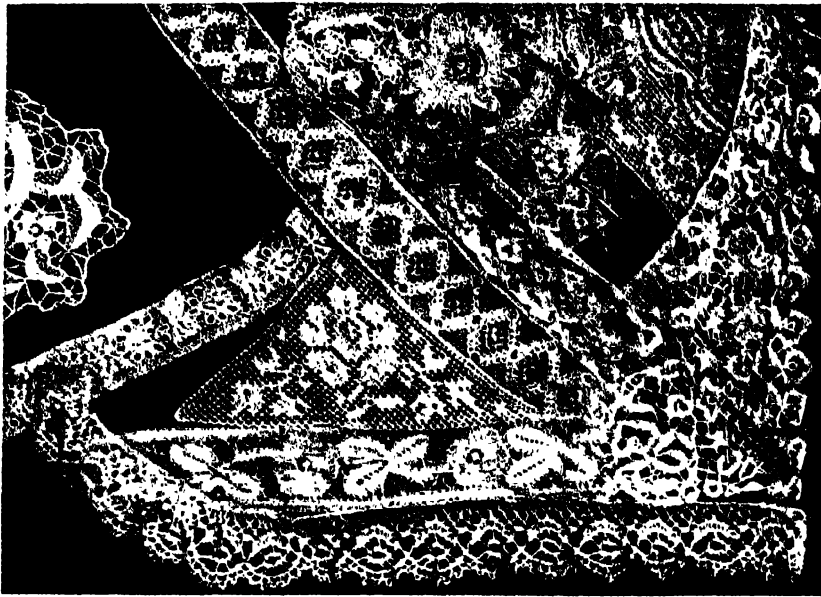
Whether leather alone or with fabrics is used, or velvets and cloths are combined, it is essential when planning the pattern to have a definite colour scheme in mind. The larger the patches the more important it is that they should harmonize with the room in which the finished article will be used. When patches are intended to match each other they must be cut to exactly the same size. It is a good plan to make a template for each required shape out of cardboard to guide the scissors. The patches should be cut larger than the template to allow for turnings. Pieces of writing paper may then be cut to the exact size of the template and pasted lightly to the back of the leather or velvet patches in order to ensure even turnings.

Templates would be too laborious a method to adopt for patterns except in the case of simple designs requiring only a few shapes. It is advisable at first to use straight-sided patches. Squares, oblongs, triangles, stripes, diamonds, and hexagons or stars need but a skill in joining than curved pieces. Some excellent designs for suede-finished leather and velvet patchwork for cushions, telephone book covers and tops of floor pouffes can be evolved from stained glass window paper. The lines of the leading can be traced out with the aid of carbon paper on an unbleached calico or linen foundation, the colours of the patches carefully selected and cut out from separate transfers of their respective shapes made from the stained glass window pattern on to tracing paper. No allowance for turnings is needed, because the joins are covered by narrow gimp or a tinsel braid.

Patchwork of Thin Materials. For articles such as handkerchief or nightdress sachets and workbags, scraps of coloured ribbons arranged in striped designs with zigzag



Patchwork. Fig. 1. Table mat of lace patchwork. Many scraps of lace are arranged round a central motif.



Patchwork in lace. Fig. 2. Duchesse cover in preparation, showing how the different pieces of lace are arranged on a brown paper pattern. The patchwork is finished by an edging of lace

triangular borders will form neat patchwork. A piece of floral silk or satin may be chosen as a central motif and framed with scraps of ribbon which tone with material used for the rest of the article and with the motif. Fancy stitches may be introduced for joining pieces or for adding interest to designs. Buttonhole, ornamental blanket stitch and satin stitch are useful. Wide feather stitch (q.v.) or faggoting (q.v.) are very suitable for linen patchwork.

Faggoting may be used to assemble scraps of linen, poplin or easement cloth for runners and mats. Patchwork in four colours such as grey, green, pink and rose, or brown, beige, yellow and orange, is effective for these. The scraps should be cut into squares or oblongs and arranged so that the colours balance nicely. One shade should be chosen for the narrow border to be faggoted to the joined patches, and the embroidery cotton used for

poster. Floral designs can be built up from scraps of cretonnes, cutting out flowers and leaves to make a panel. Patchwork designs should always be conventional when used for large panels. When really well executed they form admirable wall decorations.

Lace Patchwork. Oddments of real lace or of good machine made pieces are often to be found in the housewife's scrap bag. These can be turned to excellent account for table mats and runners. A paper pattern of the desired shape is cut out and the pieces of lace are planned out on it to form a pattern. For a set of table mats a number of pieces are required. The store at home may be

eked out with remnants which may be purchased at a sale for a small sum.

The table centre would be planned out on a stout brown paper pattern, cut out with a diameter of 19 in. Next cut out six brown paper patterns for the plate mats, 9 in. in diameter, and then six for the glass mats, of 6 in. Start work on several of the smaller ones, as it is easier to plan out the pieces on two or three at once. A motif is required for the centre of each mat as shown in Fig. 1, and then strips or pieces of any different kinds of lace are utilized to fill the space. The method of working is shown in Fig. 2, where a duchesse cover is illustrated in preparation. The patchwork is completed by an edging lace. This edging should match in all the pieces of one set, and may have to be specially purchased in a good remnant. A narrow Bucks or Valenciennes lace is the best choice for this purpose. The motifs for the table mats need not match, and a rather more important one should be chosen for the table centre. Lace crochet motifs can be used.

To make the mats the central motif is pinned to a brown paper pattern with the right side downwards next to the paper. Use small pins. Then the rest of the pieces are also pinned in position, just touching sufficiently to be whipped together. Finally, the edging lace is gathered just enough to make it lie flat round the edge and also pinned into place, then all the pieces are tacked and the pins removed. Overcast all the seams with tiny stitches. When the mat is thus completely sewn together on the wrong side, the lace



Patchwork in paper. Fig. 3. Example of pictorial patchwork copied from an old Georgian chintz the design being entirely made from small scraps of coloured paper

the faggoting should match this. A good effect is gained by cutting the central oblong or square also of this shade and larger than the rest of the patches. Individual taste will evolve many ideas on these lines. Borders may be of narrow lace if a remnant is forthcoming from the scrap bag, or edges may be scalloped.

Pictorial designs can utilize a number of colours and fabrics. Really fine work is done on pieces of canvas with contrasting materials and a variety of stitches to outline detail and supply shading. Such work requires very careful planning, and it is best to begin with a simple landscape scene copied from a small



Fig. 4. Primroses and violets in a bowl, cut out of coloured paper and pasted on a background, form a charming picture. Fig. 5. Paper patchwork picture suitable for wall decoration

paper is removed and the mat is carefully pressed. It may be lined with fine washing net to increase durability. Directions for washing, and further instructions for sewing lace are given in page 685. No. 40 white cotton should be used double, as the lace must be strongly sewn together.

Paper Patchwork. The 18th century craft of making patchwork pictures from scraps of coloured papers has recently been revived. An easy and far less artistic development of this work was the patchwork from coloured scraps, such as are stuck on the outside of

Christmas crackers and flowers from cards, etc., which were assembled, gummed on to screens and other articles, and then varnished. Many Victorian screens and papier mâché boxes and brackets were decorated in this manner.

The exquisitely delicate picture illustrated in Fig. 4 of violets and primroses in a bowl is a return to the 18th-century method. Nothing but coloured paper is used, each petal, leaf and flower centre is cut out separately and pasted on the background, and no drawing is done first on the paper either before or after it is cut. The most beautiful colours can be obtained from using good coloured advertisements and cutting out each tiny section from these in the tint required. The effect is mosaic-like when finished, glazed and framed.

Bolder designs may be executed in foil papers. These are sometimes applied to glass, being pasted on to the reverse side, an idea which is utilized as a decoration for trays, which are afterwards backed and framed with wood. The foils in which chocolates are wrapped are used, and any oddments of gold or silver paper to make up the designs.

Some of the most beautifully executed patchwork pictures are done by those who have no skill with the pencil. A sense of colour is necessary and accuracy with the scissors, which in this work are the artist's implement. Figs. 3 and 5 are examples of decorative designs done in this way and copied from 18th-century chintz patterns. Special prepared coloured papers gummed at the back can be bought for this work, but the better way is to store up a collection of scraps of every conceivable shade and kind of paper from cuttings of brown and blue grocery bags to scarlet tea wrappings, and from silver paper to fragments of wall-papers.

PÂTE DE FOIE GRAS. The livers of geese are prepared and sold as a table delicacy under this name. To serve the foie gras on toast make croutets of bread. Pound the foie gras and mix it with a little Worcester sauce and seasoning. Pile it lightly on the croutets.

Another savoury dish prepared from foie gras is made by melting 2½ oz. butter in a frying pan, putting in 6 or 8 water or milk biscuits, and heating them slowly. While they are heating turn the biscuits frequently in order that they may soak up as much of the butter as is possible. When they are ready, lift them on to a dish, dust them with pepper, and place on each a small heap of foie gras, which should first be rubbed through a sieve with ¼ oz. butter and a squeeze of lemon juice. Put the dish into the oven for a few minutes, until the foie gras is thoroughly hot, then sprinkle each biscuit with a little chopped parsley and serve them at once. A small tin of pâté de foie gras is required for this recipe.

Foie gras may be used for sandwiches and is also served in aspic jelly. Rinse some small truffle moulds in cold water, and pour into them a little aspic jelly to coat the top of each mould to about the thickness of half a crown. Allow this jelly to set, using ice if time is of importance; then decorate it with pretty shapes of cut truffle and chilli forming a pleasing design in red and black. Set this with a little more jelly, and, when firm, place in each mould a small, ball-shaped piece of foie gras. Finally fill up the moulds with more jelly, then leave them to set, when they may be turned out on to a dish. About ½ pint aspic jelly, a small pot of foie gras, 1 or 2 picked chillies and a small truffle would be sufficient to make six savouries.

PATENT LEATHER. New shoes of patent leather will wear much longer than usual if treated to a liberal application of vasoline and put aside for a week so that the

grease may soak in. This not only softens the leather, but also prevents cracking.

In cold weather, before being placed on the feet, the surface of the leather should be warmed gently before a fire or with a warm hand. The fact that the patent leather will not stretch like ordinary leather should always be borne in mind. If the shoes are tight when bought, no amount of wearing will ease them until they crack.

Glycerin and castor oil are good dressings for patent leather, but only a very small smear should be used, and that rubbed well in and then rubbed off again. Special transparent dressings for patent leather, which can be obtained at most shoe retailers, are also to be recommended.

Old patent shoes sometimes become lined or covered with crow's-foot cracks. A rag dipped in turpentine and rubbed well over the surface will be found to anneal these cracks, and with a little patience the surface will be restored to its original gloss. See Boots.

PATENT MEDICINE. Common misnomer for what is correctly called proprietary medicine, that is, a medicine evolved and

manufactured by a drug house and having a branded name. The term patent was applied because such medicines were originally made under letters patent. Until 1941 all patent medicines paid an excise duty, the amount of which was indicated on a stamp fixed to the container in which the medicine was packed.

By the Pharmacy and Medicines Act of 1941, it is compulsory to disclose on the container of a patent medicine the ingredients and quantities. This enables a purchaser to avoid substances to which he knows he is sensitive. It is an offence for a manufacturer of patent medicines to claim that his product cures an ailment. Reputable drug houses produce large numbers of effective medicines which doctors do not hesitate to prescribe; they should not be used in serious cases without medical advice.

PATERA. A patera is a circular ornament used on furniture to give accent to various parts of the design. It is found on Adam and Hepplewhite furniture. On the carved finials of bookcases, wardrobes, and secretaries it is separated by lengths of vertical fluting, and is a common ornament at the angles of the panels of cupboard doors.

PATHS AND THEIR ARRANGEMENT

Materials and Plans that Give the Best Results

The reader interested in this subject is referred to the entries on the various materials used for paths, e.g. Asphalt, Brick, Concrete, Gravel, Tile; and to those on Dutch Garden, Flower Garden, Lawn and the like. See also Border, Crazy Paving, Edging, Paving.

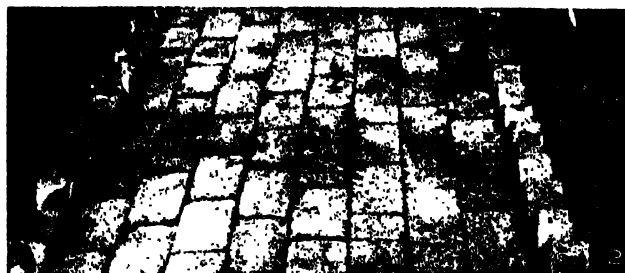
The construction of a path depends largely upon the location and style of the house and the nature of the subsoil. The materials with which it is made may be gravel, asphalt, tar paving, bricks, stone, cinders, tiles, mosaic, or concrete. The path to the entrance door, which will naturally take as direct and straight a course as possible, should measure at least 4 ft. in width, and be very substantially made. The path to a tradesman's entrance will generally be taken in as inconspicuous a manner as possible to the rear of the premises. Another form of path is the one that is often found entirely surrounding a house, this kind being generally made of concrete.

In the garden the lay out of the paths is a matter of much importance, especially when space is restricted, as by the careful planning of the paths and the correct disposition of the floral masses it is possible

order to give an air of seclusion and distance. In formal gardens, such as Dutch gardens, straight paths crossing each other at right angles are effective. These can be paved or laid with grass. Grass paths are also attractive in a rose garden or beside a herbaceous border.

Brick and Tile Paths. The choice of materials is a matter of individual selection. Gravel is pleasing in appearance, durable, and, if well laid, gives a good dry surface. An entrance path will probably be best constructed in brick or tile. This can be done by excavating the top soil and building up a hard, solid bed of gravel, hard core, or rubble, ramming this well down in the earth and grading it, with the coarsest at the bottom and the finest at the top, not forgetting to provide for drainage according to the site.

The bricks, which should be laid to a fall to drain off surface water, may then be bedded on this foundation, either in sand (Fig. 1), or, if preferred, in cement or lime mortar. If the bricks are bedded in sand it will be best to grout them in with cement mortar (Fig. 2). A liquid mixture of cement and water is poured over the surface of the bricks and well brushed into the cracks.



Path. Fig. 1. Making a brick path. The coarsest soil is first rammed down, and above this the bricks are bedded, either in sand, as above, or in mortar. Fig. 2. The finished path after grouting with cement.

to obtain a sensation of distance which would otherwise be lacking.

If the garden is of considerable size, a good plan is to make a principal path going direct from the house to some conspicuous point, such as a summer-house or sundial, and from this to take other paths in different directions and turn these about in

with a stiff bristled brush. The surface is well washed over with water and scraped clean while the mortar is still green.

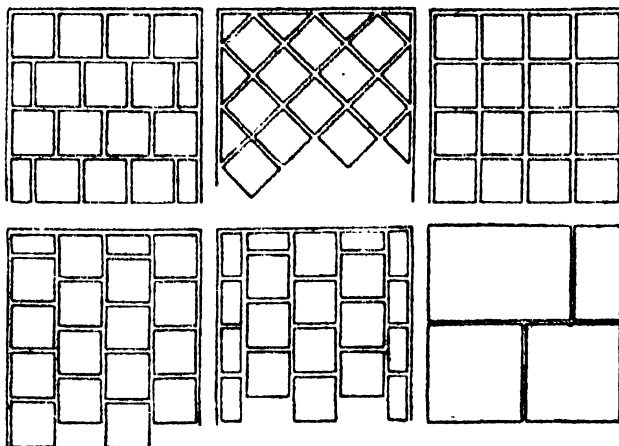
Tiles can be dealt with in a similar manner, but the edge or kerb must be made sufficiently strong to bear the weight of persons walking on the path, and may take the form of tiles, bull-nose bricks, or other material. Concrete may be employed, either in slabs and in different colours, or broken into pieces, using black coloured mortar in which to bed the concrete. Another variation is the use of York stone paving, either in hewn slabs or in random pieces, laid down like crazy paving.

Mosaic (q.v.) is expensive and more suitable for internal use, as in a courtyard or for the floor in a porch. Where quantities of broken stone are available, or small cubes of granite, an excellent composition path is made by lining the sides with bricks and placing other bricks to form a simple pattern, connecting the two side courses of brickwork. The spaces between are filled with lime or cement mortar, the cubes of granite or the broken pieces bedded into it, and the whole beaten down smoothly with the aid of a rammer and a board laid on the surface. After the cement is set, and while it is still green, the surface is well washed with water and scrubbed.

Cobbles. Another style is provided by cobble stones bedded in cement mortar, and used with a brick or rough-hewn granite edging or kerb. In some districts it is possible to obtain old granite blocks originally used for street paving, and these, if not too badly worn, make an excellent path, and may be laid as if they were bricks.

A Substitute for Asphalt. Asphalt paths and courtyards are convenient, but difficult for the amateur to lay, unless the area to be covered is large enough to warrant the expense of obtaining use of the necessary heating oven and rammers. A convenient substitute is to use a mixture of 95 p.c. by weight of stone-dust—obtainable from a mason's yard—and 5 p.c. of tar. The proportion of 5 p.c. of tar should not be exceeded or the mixture will not set hard. In laying this paving material, the earth must be well rammed or tramped to make it solid. Two inches of the mixture is then applied, and thoroughly well rolled or tramped. The finished thickness should not be less than 2 in.

The pathways in the garden itself need not necessarily be built up with such hard and impervious materials as the foregoing, but could be left in the form of natural grass paths, the borders being defined by floral plots. Where much traffic is expected on such a path, stepping stones made of



Path. Fig. 4. Diagrams showing various ways of laying concrete tiles; these form a durable material for paths.



Fig. 5. Formal design of concrete tiles which make an effective entrance path. They are obtainable in various colours. Courtesy of Naxos, Ltd.

random pieces of flagstone or granite, sunk in just below the surface of the grass so that the grass may be cut with a lawn mower, will take a good deal of wear, and at the same time will look very picturesque.

Cinder Paths. A simple path can be made with cinders removed from the grates and saved until the quantity is sufficient. Suitable material can often be obtained from the local gas-works for a little more than the cost of cartage. The foundation may be composed

of odd pieces of brick or stone, etc. The first thing to be done is to mark out the position of the path with a garden line, a number of pegs being driven in as a further guide. The top surface of the marked-out path should then be removed to a depth of 2 or 3 in. Into the shallow trench thus formed is put the foundation material, and the whole is firmly rammed in.

On ground intended to be turfed the margins of the path may be defined by an edging of rough boards, between which the path is laid, turf being brought up close to the edging outside (Fig. 3).

The cinders are graded according to size; they are placed with the coarser grade at the bottom, gradually working up to the finest grade, which should be on the surface. A better result will be obtained if each layer of the cinders is firmly rammed or rolled down. Then give the completed path a good rolling and watering, so as to ensure its being firm, and to prevent it from picking up on to the boots when walked upon.

Concrete Tiles. Concrete paving tiles in various colours are available, and form a durable and comparatively inexpensive material for paths. A typical product is made in 9 in. square, 9 in. by 4½ in., and 12 in. by 12 in., with a thickness of 1½ and 1¼ in. Larger sizes (2 ft. 3 in. by 1 ft. 6 in., 1 ft. 6 in. by 9 in., etc.) are supplied in a thickness of 2 in.

The diagrams given in Fig. 4 show various ways of laying the above. A space of half an inch is left between tiles, which may be laid in mortar or cement. Another method is to spread a thin layer of sand or sifted earth over the prepared foundations, and then to lay the tiles in position, pressing them firmly in place. The joints are afterwards filled in with earth or sand.

A path should require little or nothing in the way of care and attention or repairs, except at very infrequent intervals; but generally all paths composed of rubble, cinders, clinker, gravel, and the like may wear into grooves and hollows. In such a case break up the surface, and re-lay with the old material and a top dressing of clean, fine material, well rolled and watered, and with a nicely cambered surface.

PATIENCE: SOME GAMES EXPLAINED

A Popular Pastime for Winter Evenings

For the purpose of this article a number of patience games have been selected and the way to play them explained. Those interested in cards will find entries on such card games as Bezique; Bridge; Cribbage; Nap; Piquet; Whist, etc.

The name patience is given to certain card games which are usually played by a single person, although there are a few for two people. They are played with one or two packs of cards, but there are a certain number for which three packs are necessary. There are a great number of these games, but the main principles are the same, to get the cards into a certain order. Some of the games are pure luck, but in others there is scope for a certain amount of foresight.

Carpet Patience. Patience games may be divided into those played with one pack and those played with two. Of the former, carpet patience, a very simple game, may be mentioned first. For this lay out, face upward, 20 cards in four rows of five to form the carpet.

Below these place the four aces as they appear. The rest of the pack forms the stock. The object of the game is to form on each of the aces a sequence in suit up to the king. For this purpose any two is transferred from the carpet to its position on the ace, and then a three, and so on. Vacant spaces in the carpet are filled from the stock and the game proceeds as long as possible on these lines. When no further progress can be made the player must deal the stock of cards, face upward, in a heap, known as the waste, and vacancies in the carpet must be filled from these. The top card of the waste can, if suitable, be played on to one of the sequences.

Sultan Patience. To play this patience, take out the four kings and the ace of hearts

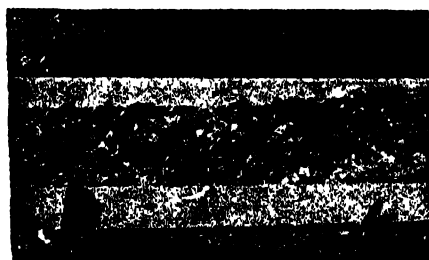
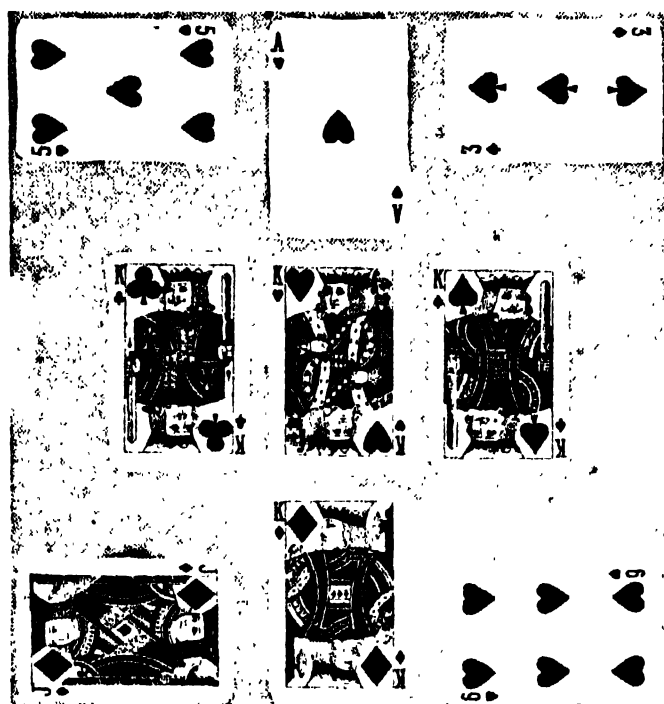


Fig. 3. Rough boards set up parallel to each other to form the limits of a narrow path.



Patience. Fig. 1. The base foundation cards laid out to begin the game of Sultan Patience, with the king of hearts, or sultan, in the middle

for foundations on which to build. After the remaining cards have been shuffled and the pack cut, four other cards are dealt out to be the foundations of four other piles. The actual building then begins on the nine foundation cards. On the king of hearts, who is the sultan, only a descending sequence of hearts can be built. On the three other kings an ascending sequence of the suit to which each belongs beginning with the ace, can be built. On the ace of hearts an ascending sequence of hearts can be built, and when this is in line with the descending sequence on the king, the cards are transferred from the latter to the ace, leaving the king alone. On the four other cards a descending sequence of any suit can be built, and the exposed card can, if suitable, be transferred to one of the five piles of which four kings and an ace are the foundations. These are seen in the illustration above.

The cards not wanted for any of these nine piles are put, face upward, on a rubbish heap, and the top one can be used whenever suitable. After the cards have been dealt, those in the rubbish heap are dealt out again. They may either, by being unsuitable, block the game, or may enable the five main foundations to work out. If this is done the sultan will be surrounded by four piles, on the top of each being a queen.

Sir Tommy. Sir Tommy is another variety that is played with a single pack. Its object is to build up four packs of cards from the ace to the king, but it is not necessary to follow suit in so doing. The cards, having been well shuffled, are played out. Four of them are put down for the foundations and there is no rubbish heap. As the aces appear they are placed below the four existing foundations, and the object of the game is to build on them at every opportunity.

If the cards dealt will not go on to an ace pack, they must be placed on one of the four others, and this usually presents a difficulty. It is not easy to decide, for instance, whether a six should go on a five or on a knave, and high cards must often be placed upon low ones. If the kings and other high cards come out fairly late, the patience is almost impossible to accomplish. Some players keep one pack for the high cards, and this is desirable.

to ace, two, and so on, until the 13 cards are in place.

Exposed cards can be placed, not only on foundations in ascending sequence of suit, but on to four depots in descending sequence of alternate colour. A sequence of cards, or any portion of a sequence, can be transferred at any time from one depot to another, provided the proper sequence and alternation of colour are preserved. When 11 of the cards in stock have been taken either of the remaining two may be played. A space occurs when all the cards in a depot have been played, and this must be filled by using the top card of the stock. After the stock has been exhausted it may be filled with any exposed card.

The cards remaining in hand after the initial deals are dealt in batches of three face upward to a rubbish heap, and the top card of each then becomes an exposed card. Such can be played either on foundations or depots, when the card immediately below it becomes exposed. When only two cards of the pack are left in hand they are dealt separately, and either or both can be played. When all are placed the rubbish heap should be picked up, turned face downward, and dealt out again, the cards from it being played until the patience comes out or is blocked.

Divorce Patience. Divorce patience is played with a single pack. Going through the cards, the player forms of them four

Demon Patience

Demon patience requires only a single pack. Having shuffled and cut the cards, deal 13 of them, one on top of the other to a stock. Then deal four others out in a row and another one to begin a row above them. This serves as a foundation card, and as they appear the other three cards of the same value as this one are placed with it to form the four foundations. Thus, if an eight is the card first placed there, the other three will also be eights. On these foundations any suitable exposed card, in ascending sequence of suit, can be played, the exposed cards being the top ones of the four packets on the lower row and the top one of the stock. The ascending sequence goes to the king and then

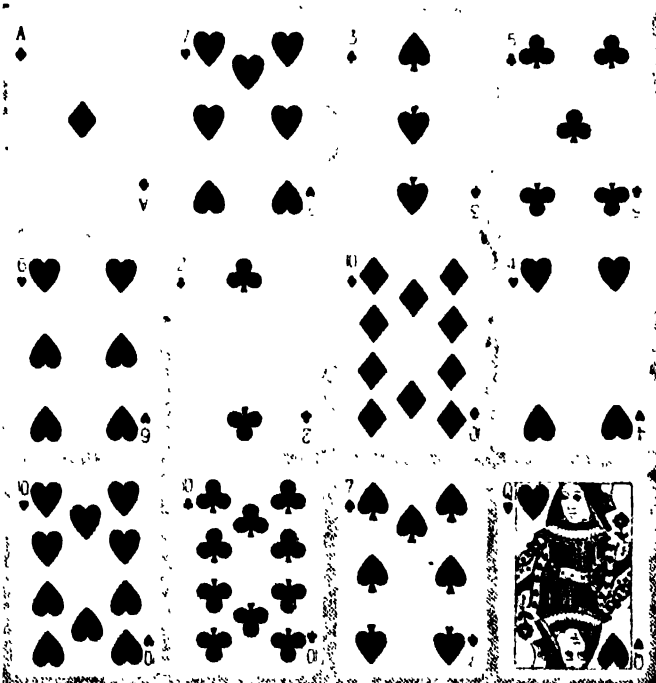
heaps of rubbish, keeping out only the aces and twos. He can distribute the cards to the various rubbish heaps as he likes. The aces and twos he places in two rows, aces above and twos below, the suits corresponding to each other. His aim is to build on each of these eight cards, in alternate numbers and alternate colours.

In this game, odd cards are placed on the aces and even ones on the twos. For instance, on a black ace a red three must be placed, then a black five, a red seven, and so on up to the king. On a black two a red four must be placed, and so on up to the queen. The pack is only gone through once; the player should concentrate, therefore, on distributing his cards to the waste heaps in a way that will assist in filling up the eight piles. It is advisable, for instance, to keep one pile in each row for kings and queens, as if they are distributed over all they will block the lower cards. If the game succeeds, the kings and queens will all be found wrongly mated.

Waning Moon Patience. Of the many patiences that are played with two packs of cards, one of the best is known as the waning moon patience, the name being due to the formation of the cards. Having shuffled the two packs together, lay out 13 piles of 3 cards each in a semicircle. As the aces appear place them on the inner side of this, and build upon them according to suit. Any of the 13 exposed cards in the outer row can be moved on to the aces in an upward sequence or transferred to another packet in a downward sequence, taking care to follow suit.

When this process stops, the remaining cards should be played out to a rubbish heap, placing them whenever possible on the piles. In case all the cards from one of the 13 piles have been transferred, any exposed card may be placed in the vacant spot. It is well to take one from a packet rather than from the rubbish heap, and the player is allowed to examine the piles in order to see which to move. The patience is worked out when all the eight inner piles are finished with a king on top of each.

Cock o' the North. Cock o' the North is a good game. Shuffle well the two packs of cards and count out eight piles of four cards each. These should be placed on the player's right.



Patience. Fig. 2. The game of Divorce Patience in progress, with odd cards on aces, top row; even cards on twos, middle row; rubbish heaps, bottom row

Four of these packets must have their faces downward and four upward. After this, deal out eight cards and place this pile in the centre of the eight; this centre pile must be played face upward. The remaining cards are dealt out, but before this is done the player should examine the piles; if one of the top cards of a pile that lies face upward is an ace or a two, this can be taken out and employed for a foundation card.

The patience is built up on 16 cards, beginning with the aces and the twos, eight of each. On the aces all uneven numbers to the king are placed and on the twos are the even numbers to the queen. Whenever an ace or a two appears it is placed as a foundation card. If any exposed card on the piles at the side becomes suitable, it can be taken away and used. The top card of the rubbish heap can also be taken, whenever possible, in order to build up a sequence; but if there is a card on the pile and on the heap of the same value, the former must be taken.

At the end of the deal take the eight cards in the centre of the side piles, or as many of them as are left, and spread them out. If any are found suitable, place them in position on the 16 piles. Next turn up the top cards of the four piles that are placed face downward and, if these are suitable, use them. When no further progress is possible, take up all the side piles and shuffle them with the cards of the rubbish heap. Then deal them out as before. Two of these deals are allowed, by which time the cards should all be in position.

Legitimist Patience. Two packs are also required for legitimist patience. Having shuffled them well, take out a king and lay it on the table; then deal out the other cards, placing in a row queen, knave, ten, nine, eight, seven, and six from any suit and throwing the rest on to a rubbish heap. These eight cards are the foundations, and as the remainder are dealt out they are built upon these in an ascending scale. The card that cannot be placed goes to the rubbish heap, which may be turned over once and suitable cards from it placed in position. The object of the game is to get 13 cards on each pile.

Miss Milligan. Miss Milligan requires two packs of cards. Having been shuffled together and cut, eight of them should be dealt, face upward, in a row to eight depots. Any cards that come out at this time, or later, are taken to form eight foundations, which are placed below the depots. The object of the patience is to build on the foundations, eight suits in ascending sequence. Exposed cards, which are the top cards of the eight depots, are played in ascending sequence of suit to foundations, or in descending sequence of alternating colours to other depots. A complete sequence of any number of cards may be transferred bodily from one depot to another provided the proper sequence and alterations of colour are maintained. Portions of a sequence cannot, however, be transferred except the top card, which can be moved at any time. A space occurs when all the cards of a depot have been played. Such spaces can only be filled by a king or sequence to a king. If this is not possible, it must be left vacant for the time.

When all available cards have been taken from the depots, a second eight cards should be dealt to them, and in this way any spaces which may have occurred will be filled. The available exposed cards should then be played, after which another row should be dealt out, and this continues until all the cards have been played out. It should be noted that in each round cards must be dealt to all the depots before any one of them is played out.

Quadrilateral Patience. For quadrilateral patience two full packs of cards are also required. Having shuffled both together, deal

six packets out in a row, three cards being in each packet. They should be face upward. Then lay out six more packets of three each, three on the right and three on the left, in such a fashion that with those already in position they make three sides of a square. The space in the centre will be filled with the eight sequences, the building up of which is the player's aim.

The sequences start with the next card turned up. Whatever this is, each sequence will start with one of the same value. For instance, if it is a three each sequence will run in suit from the three to the two. The player should first note whether there is among the twelve exposed cards one or more that will serve as foundations, i.e. that correspond in number with the one just turned up. If so, that card is taken away and laid next the original foundation card. The player should next consult the exposed cards to see if he can pack any of them in descending sequence of suit for use later. He may be able to place a seven on an eight, or a queen upon a king.

Having done all possible in this direction, the player must deal out the remaining cards to a rubbish heap, laying out any foundation cards as they appear, and whenever possible playing the other cards on to one of the 12 packets or one of the eight foundations. When any packet is exhausted, he can place there a card, either from the rubbish heap or from one of the other packets. The latter is better, as it gives greater opportunities for working off the cards. The cards are only dealt out once, but when this is over the player is allowed to take five cards from the bottom of the rubbish heap and spread them out. This will help to place further cards, and may enable the game to be completed.

Khediye Patience. Khediye patience is not difficult to work out. Having shuffled the 2 packs, lay 25 cards out in 5 rows: 9 cards in the bottom one, then 7, then 5, then 3, and then 1, the whole resembling a pyramid. From these cards the player chooses one as the base card. This should be a two, if there is one, or, if not, another low card—say a three or a four. This should be placed on one side, and as the other 7 cards of the same value appear they should be placed at one side of the other until there are 8 altogether. On these 8 cards sequences in their own suit must be built up. Any suitable card can be taken from the table and the vacancy made filled up from the pack. When no more progress can be made in this way, the remaining cards should be dealt out and a rubbish heap formed from which any vacancies are filled. If the patience works out, the pyramid of cards will totally disappear, as will the rubbish heap which feeds it.

PATINA. In furniture, this term is applied to the metallic appearance of the surface of old wood. It is regarded as a sign of age, and therefore is valued by collectors. Patina cannot properly be produced by the application of varnish or polish. It comes after years of careful cleaning and rubbing, and as a rule the upper surfaces or those that catch the dust have the finest patina.

The term patina is applied also to the characteristic appearance taken on by old bronze and copper articles, which is the result of chemical action. It is simulated more or less successfully by treating new pieces with various chemical solutions, and can be imitated also by painting such articles with one or other of the special preparations sold for the purpose.

Artificial Patina on Metals. A patina can be imparted to bronze and copper in the manner here described. A green patina is produced on bronze by brushing the article with a solution made by dissolving 16 gm. sal-ammoniac and 4 gm. sodium bicarbonate

in 1 litre vinegar. After this operation the bronze is placed for a time in a box in which carbon dioxide will be evolved. The process is repeated until the desired degree of colour is obtained.

A bright green patina can be obtained on copper by preparing 10 per cent solutions of nitrate of copper, sal-ammoniac and calcium chloride. A mixture made from 10 parts each solution is brushed on to the article and allowed to dry.

Another method for copper, which results in an antique green patina, is to lay on the following mixture quickly and allow it to dry: $7\frac{1}{2}$ gm. sal-ammoniac; $7\frac{1}{2}$ gm. common salt; 15 gm. liquid ammonia. Several applications are necessary. Some care is necessary in using these processes, and the worker is recommended to test the solution on an odd piece of metal before proceeding with a larger job.

PATRINIA. This is a hardy biennial plant sometimes called eastern valerian. It bears graceful foliage and fragrant yellow flowers. The chief species grown in gardens are *palmata*, *villosa*, and *scabiosaefolia*, which require a sunny position in ordinary soil. *Patrinia* is raised by seed sown outdoors in spring, or increased by division of roots in March or October.

PATTERN: For Dressmaking. Generally a pattern is cut out in paper for one side of the garment only. A whole pattern is unnecessary because the half can be set on double material and a whole shape cut out more easily and quickly. It is only when the two sides are different in shape that it is necessary to have a pattern of the whole garment. They are designed to meet seasonal requirements and cut out in various stock sizes; that is to say, the models are made on perhaps 4 or 6 stands of varying average sizes ranging from small to very large.

If any alteration is made, whether it is merely a simple one for size, or a big adaptation, the pattern should always be tried on after the alteration is completed, so that the exact effect may be judged. One of the rules of the home dressmaker should be to pin up and fit on a pattern before cutting the material. Only in this way can it be seen whether the desired size and style are there and so perhaps save spoiling the material.

The best course to pursue when a pattern is to be altered in any way is to take the parts to be altered and cut them in newspaper and to carry out the alterations on these newspaper parts first of all, so that the original pattern is still available.

Another essential is to note whether turnings are allowed on the pattern and, if not, to take care to leave enough on all the edges for fitting, seams, and hems. It is a good plan after cutting the material and before removing the pattern to chalk or tack round the material close up to the pattern edges, so as to see exactly what turnings must be taken up everywhere.

As a rule, paper patterns can be obtained through pattern services in connexion with fashion or needlework journals and magazines, and through special pattern cutting agencies.

Paper patterns of all kinds are supplied by some of the fashion papers published by the Amalgamated Press, Ltd., especially *Home Fashions* and *Home Dressmaker*, obtainable from a bookstall or through the post. Some famous periodicals for women, such as *Woman* and *Home*, *Woman's Journal*, etc., issue fashion supplements.

PATTERN: In Metal Work. Patterns are replicas of an object to be subsequently made in metal, and more particularly for the purpose of forming depressions in the moulding box, into which the molten metal is poured in the production of the castings. See *CASTING*.

PATTERN PRINTING ON WOVEN & HARD FABRICS

Simple Methods for Applying an Effective Art Craft

The reader interested in art crafts will find information related to this article in the entries on Dyeing; Glass Ware; Lampshade; Stencilling; Transfer.

Pattern printing within the limits of simple designs is one of the easiest of the genuine art crafts, and can be used to decorate many objects in the home. Another excellent service which its study can render is the training of school children by cultivating their appreciation of line and colour when forming patterns. Results are accomplished with comparative quickness and at a very small cost. The materials for the craft are simple to use, and obtainable through any artists' colourman.

Two of its advantages are that it can be successfully carried out almost from the first attempt, and that fabrics can be printed with washable and permanent colours. The most delicate georgette scarf can be patterned without injury, while pieces of silk or cotton which have lost colour can be renovated with pleasing results. This is particularly the case with unpatterned window curtains, bedspreads and cushion covers, the fabric of which is not worn out, but the original colours have been laundered to a drab shade. Re-dyed and bordered with pattern printing, articles which have been considered unsightly and practically worthless are transformed into attractive furnishings.

In addition to the articles to be decorated, all that is required to print in almost any colour on woven fabrics, or on hard surfaces such as glass, wood and pottery, are pattern printing liquid colours in bottles and tubes of oil colours; a set of a dozen pattern printing sticks; a palette containing small square pads to hold the colour; a saucer or white tile for oil colours; some rubber stamps or those can be cut on ordinary pieces of rubber, as will be explained later in the article; pieces of line; a bottle of copal and one of wood varnish. Bronze powders and stencil medium can be utilized in this work when it is wished to gain a richly decorative effect.

The liquid colours in bottles are specially prepared for printing on soft materials and are of the exact consistency for immediate use, while oil colours must be used for printing on glass, wood or pottery.

Oil colours may be used on woven fabrics when thinned with turpentine, but the results are not so satisfactory except for surfaces which remain flat, such as lampshades or sachets. Soft fabrics tend to become stiff when printed with oil colours, and if the pattern is large the fabric thus treated may not hang or drape in good folds.

Printing on Textiles. Some soft materials are more absorbent after washing and thus receive colour more easily; this applies to cotton and linen. Silks and other thin woven fabrics need not be washed before printing is done. A few experiments on scraps of material washed and unwashed can be made before starting to print any larger piece. Throughout the work it is advisable to have a small piece of the same material at hand on which to make a few trials and to see the effect of combinations of colour. The best way to become accustomed to the printing process is to collect some scraps of differently textured and coloured materials and make experiments, rather than risk spoiling a piece of work.

The method of working is well illustrated in Fig. 1. An inexpensive tray cloth is being printed in chrome orange, chrome yellow and ivory black. The article is laid on a board which has been padded with sheets of newspaper and a sheet of white blotting paper on top of those. Drawing pins keep the work taut and straight. A little pattern printing colour (or oil colour if preferred) is spread on to the pads in the palette. The pattern stick (one is

seen in use and others required for the pattern are on the table ready to hand) has been pressed on to the colour so that the end of the stick is evenly covered and is now being pressed on to the cloth to make the print. The actual process is simplicity itself.

The colours provided—red, orange, yellow, green, blue and violet—are brilliant and pure. Mixed with white or grey as well as with one another hundreds of distinct shades and hues can be obtained, ranging from deep full tones to delicate pastel tints. As experiments are made with the printing sticks, and each separate shape appears on the fabric patterns will be found with delightful ease. For those who wish to try experiments before attempting original designs, transfers printed full size on thin paper are obtainable for scarves, table mats, cushion covers, etc. Possibilities of combinations of printing forms can be seen from the study of one or two transfers.

Although colour is a matter of taste, there are certain rules which are useful to remember with reference to harmony of tints. Any pure colour will harmonize with black and white or grey or with itself mixed with black or white to make deeper or paler tones. Two colours will harmonize if grey is mixed with both. Brilliant effects require marked contrasts, such as blue and orange, purple and green; quiet restful effects can be worked with tones of the same colours, or with those which are closely related, such as blue and violet, or yellow and green.

A trial border can be quickly printed on a piece of nansook. First take a pattern stick which prints a half inch square and place it diagonally and join to it a quarter inch square. Repeat the arrangement along the border. This is such a simple pattern that it may seem uninteresting, but it is useful for experiment with even pressures of the printing sticks, and also for colour combination, while it forms a good surround for more elaborate designs. With regard to colour it will soon be seen that the small squares look better in a darker shade and the large squares in a lighter. With three or four printing sticks, printing different geometrical shapes, a number of simple borders can be worked, and the most interesting experiments can be made in colour.

In Fig. 1 the simple pattern would not be effective if orange or black had been used for

the large squares. By keeping these in the palest of the three tones selected they do not overpower the tiny black squares set off on a pale, nor the orange circles, and thus balance is preserved in the design. It is necessary from the beginning of learning this craft to consider not only which colours go well together, but how much of each colour is required, and on which part of the pattern it can most decoratively be employed. Most people will want to originate designs after they have practised a few simple borders and patterns and

used a transfer, ironed off on to the object to be printed in the ordinary way. Pattern printing paper is obtainable, which is marked with quarter-inch squares, on which the designs can be worked out with gouache colours. In this way the effect of tones and shapes can be judged and well balanced to suit the particular object.

When completed the original design may be transferred to the fabric in one of two ways: (1) If the material is very thin the design can be placed underneath and will show through sufficiently to guide the printer. (2) If the fabric is not semi-transparent a sheet of transfer paper will be required. This transfer paper must not be confused with the pattern printing transfers. It is coated on one side with red, blue or black, and is used in the same way as carbon paper.

At the other end of some of the printing sticks are more fanciful shapes which greatly facilitate the production of elaborate designs, and give interest to the patterns once the simple process has been mastered.

Printing on Hard Surfaces. Wood printing sticks are not suitable for printing on wood, pottery or metal. Such unyielding surfaces require a softer substance, and india rubber is the ideal material for this purpose. Flower and other shaped stamps are obtainable, or pieces of soft india-rubber can be cut to correspond with the wooden printing sticks. Another way of turning rubber into interesting shapes is to heat a knitting needle, and when red hot burn round holes with the end, and lines with the side of the needle, on the pieces of rubber.

For all hard surfaces the oil colours in tubes are used. The colour is squeezed out on to a piece of thick glass or a white tile, a little varnish is used with it, and it is spread evenly so that a palette knife will just take it up when the printing rubber or stamp is pressed into it. When the colour is dry the whole work should receive a coat of varnish.

The application of pattern printing to pottery and wood is illustrated in the various diagrams shown in Fig. 2. Pattern transfers cannot be used for such pieces of work, as it would be impossible on a hard and curved surface to keep a transfer in position. After the proposed pattern has been sketched out on a piece of paper, the worker will need to make dots with pencil or coloured crayon directly on to the article to be printed. For this type of work the simpler the designs the better. In Fig. 2, G to N show a variety of print forms that go to make up patterns. In A, nothing but different sizes of squares are used.



Pattern Printing. Fig. 1. Printing a pattern on a white tray cloth by means of wooden printing sticks and washable printing colours.

D shows the formation of the print from the rubber used for printing all but the straight lines on the vase B. The pattern on the candlestick F was entirely evolved from repetition of print G. A collection of articles, including a silk scarf, wooden candlestick, pottery case and papier mâché bowl, are shown in Fig. 3, all of which have been decorated by the simplest of designs in pattern printing.

Printing from Linoleum Blocks. Another way of making printing shapes is cutting them from thick linoleum. This method can be practised on small pieces. Special cutting tools are obtainable and comprise dividers, gouges and outline knives of assorted sizes. Printing by hand from lino and wood blocks is a more advanced form of pattern printing. The design may be drawn directly on to the linoleum, but usually it is traced on to tissue paper with Indian ink. The surface of the lino is covered with gum and then placed down on the tracing. The lino block is next turned face upward, and any bubbles on the paper are pressed out with a scrubber or rubber covered roller.

After the gum is set the block may be cut. With the knife cut round the edge of the design. A clearing cut is then made, sloping towards the base of the first one, leaving a V-shaped trench round the design. The portions of the design not required to print are then cut away with a small gouge, or a wider one is used for larger waste pieces. Very beautiful results can be obtained from these printing blocks, but such a development cannot be dealt with adequately here. Interesting shapes cut into lino can, however, be utilized to give

freer scope to original ideas. These are mounted with glue on to pieces of wood and used in much the same way as the printing sticks, but as lino is rather unyielding it is not so suitable for hard surfaces, though good results have been obtained on wood and papier mâché.

PATTY: How to Make. A small pie or pastry case filled either with meat, fish, jam, or some savoury or sweet mixture is known as a patty. The cases may be open or covered, and sometimes they are baked in small, round tins called patty pans. If the case is of puff

savoury or jam patties, and must be removed as soon as the case comes out of the oven. The patty must now be cleared of all loose uncooked paste inside and then will be ready to fill.

Cold cooked chicken, game meat, fish, mushrooms, oysters, shellfish, ham, hard-boiled eggs, etc., chopped finely and mixed with a savoury white sauce are used to fill the patty cases, which are then given the name of their contents. The small round of pastry is placed on top of the filling. They can be served hot or cold. For jam patties any kind of jam can be used.

Meat Patties. Meat patties made with plain short or flaky pastry should be baked in patty pans. A round layer of pastry forms the base of the patty, a portion of prepared meat is heaped in the centre of the round, and a second round of pastry moistened at the edge is placed over for a cover. An incision is made in the top, and the patty after being glazed is ready to bake. Add also a little stock or water and bake about 15 min. in a good oven.

Patty Pans. A small round tin known as a patty pan, having a depression in the middle and varying in size, is used for baking tartlets, etc. After use they should be wiped out with clean kitchen paper and should not be washed unless they have become covered with jam, fruit syrup, or meat gravy. See Prawn Patty.

PAULOWNIA. The hardy summer flowering tree *Paulownia imperialis* is highly ornamental, having very large heart-shaped or lobed downy leaves and violet flowers of tubular shape.

The Paulownia likes a deep, loamy soil in a sheltered but sunny position, and abundance of moisture. Propagation is by seeds sown in heat in spring, and by cuttings inserted in sandy soil under a bell-glass or handlight in summer. This tree is suitable only for planting in comparatively mild districts.

PAVING: Method of Laying. As applied to domestic work, paving is a floor or path laid with large slabs of stone, but in a wider sense may include concrete, brick, tile, tar macadam, asphalt, or any impervious material of a hard and durable nature. Examples are found in the paved courtyard, terrace or paved entrance path, while in many country homes the floor of the kitchen, dairy, and sometimes the living rooms, are paved with stones, tiles, or brick.

Should a stone paving have to be laid, it is customary to make a foundation of hard core well rammed and consolidated, and then to lay a bed of finer stuff about 2 in. thick, topping this with cement mortar or lime mortar embedding the stones in it, and completing the work by grouting with cement. Bricks or tiles may be laid in a similar manner. The joints should not be too narrow: $\frac{1}{4}$ in. is not too wide, as wide joints improve the appearance of such a floor. Smooth bricks specially intended for paving and burnt to the right degree of hardness are obtainable, but ordinary hard stock bricks or rough bricks are quite serviceable for the purpose.

Care must be taken that the joints are properly broken, that is, that no two bricks stand exactly opposite one another, as if they do the joints will be in line with each other, and the pavement would not be so durable. After all the bricks are set in position they are beaten down by laying a board on top of them and hammering it with a rammer or heavy mallet. The whole is then well grouted, thin cement brushed into all the joints, and the bricks cleansed with clean water after the mortar has set. See Concrete: Crazy Paving: Path, etc.

PAWL. A pivoted check, known as a pawl, is used in connexion with a ratchet, or similar mechanical device. Its function is to permit rotation in one direction and not in another. A common form of pawl consists of a pear-shaped piece of metal, the broadened

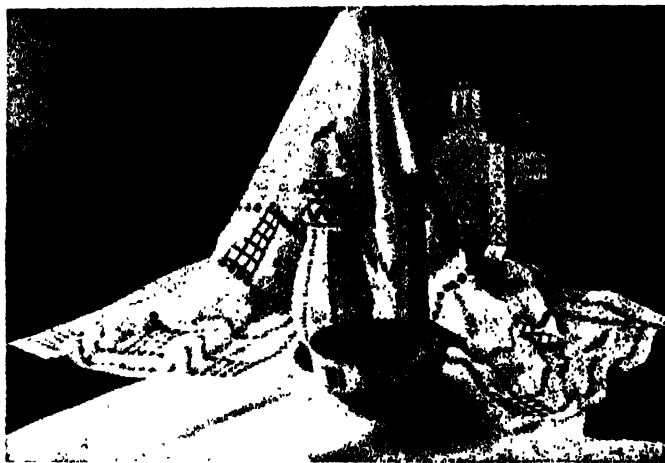


Fig. 3. Examples of pattern printing on silk, pottery, papier mâché and wooden articles.

or rough puff pastry it should be cut out of a sheet of pastry about $\frac{1}{4}$ in. thick with a sharp, round cutter and baked on a steel baking sheet wetted with cold water. When properly prepared and baked in a hot oven, the rounds will rise to the correct height for oyster or any other variety of savoury patty.

The cutter should be rather larger than the size desired, as when the cases rise in the oven they diminish somewhat in circumference. When the rounds are laid on the baking sheet, an inner circle should be marked on the surface with a smaller cutter, leaving a margin round the edge. This inner portion forms a lid for

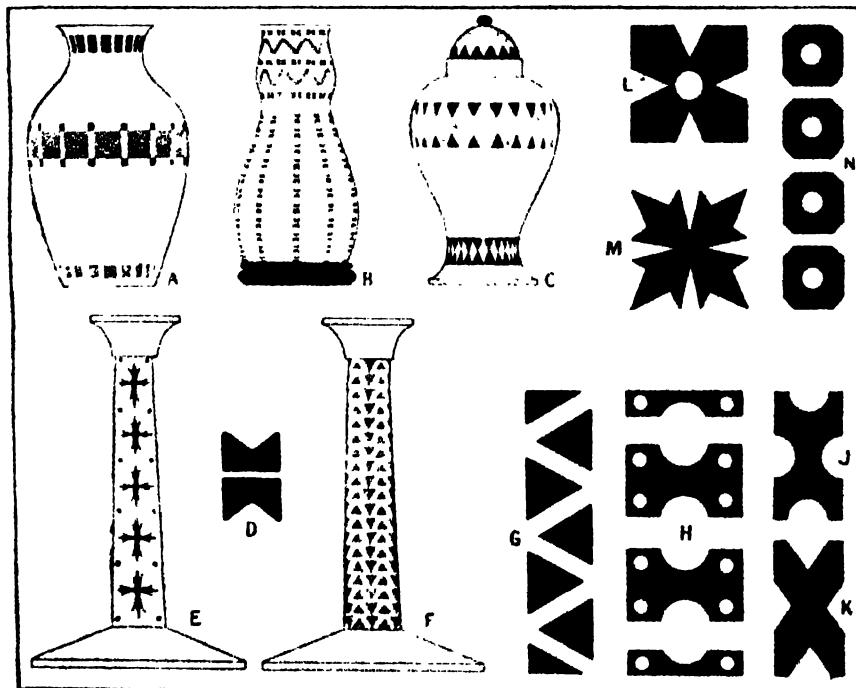


Fig. 2. Diagrams showing pottery and wooden articles decorated with pattern printing executed by means of rubber prints and oil colours. See text.

end of which is pivoted to the one member and the narrow end rounded off to some pointed shape, so that it can engage in the teeth of a ratchet wheel or other device.

A pawl is sometimes made reversible, or double ended, so that in the one position it will permit of rotation in a right-handed direction, and when in the other position in a left-handed direction. Common applications are found in machinery, and clocks and watches of all kinds, where a pawl is used as a check or detent to the main spring.

PAYING GUEST. Unlike the ordinary lodger, a paying guest is a person who shares the family life of the people with whom he or she boards. The usual arrangement is for an inclusive fee to be charged, and for the person to be treated exactly like a guest, to be given the best of which the household is capable.

Legally, the position of a paying guest is that of a boarder; for in essence his contract is one for board and lodging. The only difficulty ever likely to arise is as to the length of notice to be given on either side to terminate the contract; so that both host and guest should be careful to make an express stipulation on this point. There is also an implied undertaking on the part of the host to provide food and accommodation reasonably adequate according to the sum paid by the guest, and one by the guest to behave in a proper manner in the house. Indeed, it would probably be held that these stipulations were conditions upon the breach of which by the one, the other party would have the right to terminate the contract. See Boarding House; Guest House; Lodgings.

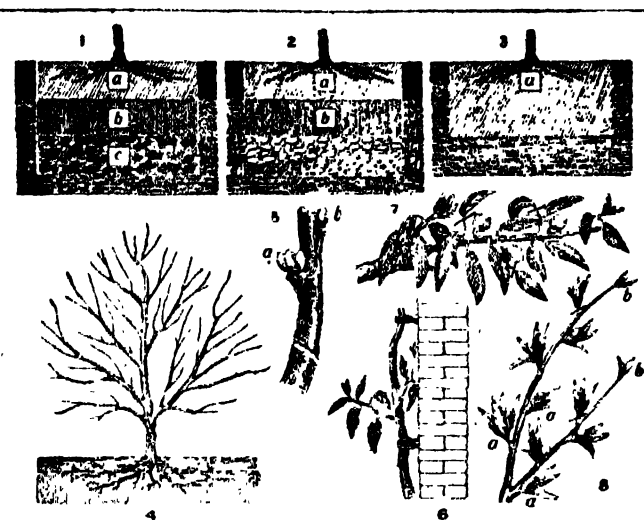
PEA. This is the name both of a certain plant (*Pisum sativum*) and of its seeds that are used, either green or dried, for culinary purposes. The plant is more usually spoken of in the plural, under which heading is appearing in this work. Other members of the same family, for instance, the sweet pea, everlasting pea, and glory pea, are grown for their flowering qualities. See Everlasting Pea; Glory Pea; Peas; Sweet Pea.

PEA BEETLE. A little insect that is often very destructive to seed is the pea beetle. It lays eggs in immature pods, and these hatch into legless grubs, which eat their way into seeds and pupate in the cavities. Seed containing this pest usually fails to germinate, imported seed being more likely to be infested than home-grown samples. There is no reliable remedy, and all infested seed must be burnt. See Peas.

PEACH. The peach is one of the most delicious of fruits. In Great Britain it can be grown to perfection out of doors, but only on a sunny wall. One variety, named Breda, may succeed as a standard tree in the open garden in mild districts. Peach trees grown under glass, either in a heated or unheated glasshouse, yield exceptionally fine fruits. The cultivation of the peach tree requires care, otherwise

disappointment is almost certain. Unless the soil is naturally loamy old turf soil and decayed manure must be added before the trees are put in. Planting should be done in autumn. When the trees are in bloom it may be necessary to protect the flowers from damage by frost.

Pruning is a detail of great importance in the management of peach trees. In spring fresh shoots will develop freely on the old branches, and if all are allowed to remain the tree will be spoilt. All except two shoots on each branch of the past year's growth should be removed while they are small. One must be left at the top and another near the base; the remainder should be rubbed off, a few at a time, during a period of two or three weeks. This practice is termed *disbudding*. In late summer, when all the fruits have been gathered, the final pruning takes place: it is done by cutting out the branches of the previous year's growth and tying in the new shoots to replace them. Thus a considerable part of a peach tree is renewed yearly. Shoots which grow one year bear fruits the following year and are then cut out. Peach trees grown under glass need similar treatment: if early fruits are required their development may be hastened by maintaining a warm and moist atmosphere in the glasshouse when the fruits are about one third full size. Amateurs will achieve success by ventilating the glasshouse freely during the summer months. Some of the best varieties are Royal George, Starling Castle, Barrington, Early Rivers, and Grosse Mignonne. Peach leaf curl, a disease which causes blister-like patches on the leaves, is often troublesome. It can be prevented by spraying with Burgundy mixture in February.



Outdoor Peach. Cultivation. 1. Planting in loamy soil: a, heavy loam and old mortar; b, original top spit; c, bottom soil opened with brick-bats. 2. Planting on wet soil: a, heavy loam; b, original top spit; c, brick-bats. 3. Planting on shallow soil: a, subsoil removed and replaced by good compost. 4. Shallow planting of a wall tree. 5. How to distinguish buds: a, fruit buds; b, growth buds. 6. Remove front and back branches. 7. Stopping laterals at base of fruit and keeping to one leaf. 8. Disbudding: growths at a and b to remain unchecked.

and cut it into halves, removing the stone. Blanch the kernel. Boil the peaches gently in syrup, then pour them into an earthen vessel and leave all night. The following morning drain them, boil up the syrup and let it thicken, then simmer the fruit in it for about 15 min., and it will be ready to bottle. Add the blanched kernels of the stones, if desired.

Peaches make a good filling for a flan if cooked in syrup a few minutes, or they may form centres for small tarts, with or without whipped cream. They may also be added to trifles and other light sweets.

To stew peaches, gently simmer the contents of a tin of peaches in syrup for 5 min. and dish the fruit with syrup poured over. Colour the syrup with cochineal before adding to the fruit. Serve with cream or custard. To

make the syrup, strain through a hair sieve the liquor from the peaches, add 4 oz. white sugar, and boil till reduced to a fairly thick syrup.

Peaches, either fresh or tinned, may be used for a jelly, a tart, or a sauce in the same way as apricots are used. (This is described in page 29.)

Peach Cups. Drain the fruit from a large tin of peaches, and arrange each half in a shallow dish with the cut side uppermost. Sweeten and flavour a gill of cream, whisk it until it thickens, and then heap some of it in the centre of each peach. Place a crystallized violet on top and round it some small leaves of angelica. Strain the syrup round and serve.



Peach Cups. halved peaches filled with cream and served with the fruit syrup



Peach. Two specimens of the downy-skinned and luscious dessert fruit
Courtesy of Amateur Gardening

The Fruit. No preserved or foreign peach possesses the delicate flavour of the English fruit, but imported peaches of best quality also appear as dessert fruit. The second quality and preserved or canned peaches may be converted into many sweets and are not expensive.

Imported or home-grown peaches may be preserved as follows. Pare the fruit, which must not be quite ripe,

Peach Gâteau. To make this trifle, a border ring of sponge cake, a large tin of peaches, cream and flavouring are required. Put the sponge cake in a glass or silver dish.



Peach Gâteau, a trifle made with tinned peaches, sponge cake, cream and blanched almonds

soak it with $\frac{1}{2}$ gill sherry and a little of the peach syrup, and then stick into it 2 oz. blanch and skinned almonds cut lengthways into thin slices. Round the base of the ring place 2 or 3 peaches cut into quarters, and the remaining fruit and syrup in the centre, and over them shake $\frac{1}{2}$ pint stiffly whisked cream flavoured with vanilla and sweetened to taste. Garnish the top with a few crystallized violets.

Peach Jam. This is made by peeling and cutting into halves 6 lb. peaches. These should be put into an enamel or steel preserving pan with $\frac{1}{2}$ lb. loaf sugar to each lb. of fruit. Boil for about an hour, stirring frequently to prevent burning. When almost set add the

kernels, which should previously have been removed from the stones and blanched. Put into jars and cover each with paper dipped in brandy. See Neectarine.

PEA-NUT. The peanut (ground nut, monkey nut) is valuable because of its oil, and it forms the foundation of some nut butters. As well as being eaten as dessert, these nuts are sometimes ground or flaked and then mixed with fresh mashed fruit, such as straw berries, or raspberries, or sprinkled over the surface of stewed fruit, sundaes, or ices.

Peanuts lightly browned in hot butter and then seasoned with salt are quickly and simply prepared. Shell and skin about a quart of nuts, and shake them gently in a pan containing 2 oz. smoking hot butter. When they are of a pale brown colour lift them out, drain them, and coat them lightly with salt to which a little cayenne pepper has been added. Dry the nuts in a cool oven, shake off any loose salt, and, when they are cold, store in tins till needed, or eat them hot.

Peanut sandwiches are made *à la* finely ground or grated nuts, from which the skin have been first removed. Mix these with half their weight of fresh butter or whipped cream, season the mixture lightly, and spread between thin slices of brown or white unadorned bread. Peanuts are often added to trolle in the same way as almonds. See Almond, Fudge, Monkey Nut.

PEARS: IN GARDEN AND HOUSEHOLD

Directions for Growing and Preparing a Popular Table Fruit

This article is of the same lines as those that deal with the Apple, Cherry and Plum, the growing and cooking of the fruit are described, and then follow the various dishes that can be made from it. See further Diet, Fruit, Cooking, Grapes, Pruning.

The pear is one of the most delicious of all hardy fruits and is especially well suited to cultivation in the milder parts of England and Wales; elsewhere the house varieties should be grown on a sunny wall. When budded on the pear stock the tree will reach a height of 20 ft. or more and live to a great age. In this form it is suitable for orchard planting. Pear trees budded on the quince stock are more suitable for gardens, for they are of less vigorous growth and take up less room; they may be set at 10 to 12 ft. apart. Trees on the pear stock are usually grown in the form of standards; those on the quince stock may be bushes, pyramids, or fans, fan-trained or horizontal espaliers. Those planted against a wall are cordon, fan-trained or horizontal espaliers.

Pear trees prefer well-drained loamy soil, but they will thrive in ordinary garden ground that is not waterlogged, provided they are planted in a sunny position. In heavy soil it is wise to plant the trees at such a depth that the uppermost roots are covered only by 2 or 3 in. of soil; mortar rubble may be mixed in freely with advantage.

During the last few years pear trees usually make luxuriant growth but bear little fruit, to counteract this tendency it is a good plan to lift young trees other than standards every autumn for the first two or three years after planting, shorten long, thick roots, and replant at once, taking care to keep the uppermost roots near the surface. If this procedure is followed there will be less need for severe branch pruning, with consequent advantage to the trees.

Pruning in summer and in winter is necessary. In summer the side shoots on the main branches should be shortened to within about six leaves of the base of the current year's growth. From the middle to the end of July is the best time for this work. Care must be taken not to prune natural fruit spurs; those short stunted shoots on which blossom buds form naturally.

At the winter pruning, which should be done in December or January, the side shoots

are again pruned, to within about three buds of the base of the past summer's growth. Branches which tend to block up the centre of the tree or to cause overcrowding should be cut out; this thinning out is important, for fruit buds will not form unless the shoots are fully exposed to air and light.

It is necessary to make a careful selection of varieties, for some are more reliable in cropping than others. Some of the most suitable for general cultivation in the open garden are Conference (a very valuable cropper), Fertility, Williams's Bon Chrétien, Souvenir du Congrès, Doyenné du Comice, Emile d'Heyst, Louise Bonne de Jersey, Jargonelle, Ferdande d'Automne and Charles Ernest. The most delicious pear of all, Doyenné du Comice, is

suitable for cultivation as a cordon or espalier on a trellis in the open garden, and as a trained tree or cordon on a sunny wall. Late varieties of pears such as Winter Nelis, Glou Moreau, Passe Colmar and Olivier de Serres need a warm wall to enable them to ripen thoroughly.

Pears suitable for planting as orchard standards are Jargonelle, Williams's Bon Chrétien, Fertility, Conference, Hessel, Lammas, Beurré d'Amanlis and Emile d'Heyst. Good cooking pears are Vicar of Winkfield, Uvedale's St. German and Catillac. The best time to plant pear trees is in autumn as soon as the leaves have fallen, but the work may be carried out between then and the middle of March in mild weather.

Mature trees which are carrying full crops are benefited by manuring from the time the pears have fairly started swelling. Sewage is excellent, but it is wise to use a special phosphatic manure also, because phosphoric acid is essential to fruit development. Mineral superphosphate is one of the cheapest forms of phosphate fertilizer, and is soluble; 1 oz. to the gallon of water is a suitable quantity. Heavily laden trees are also benefited by a mulch of manure.

Pests of the Pear. The enemies of pears are in the main those of the apple, with the difference, which is in favour of the pear, that it is on the whole the healthier tree.

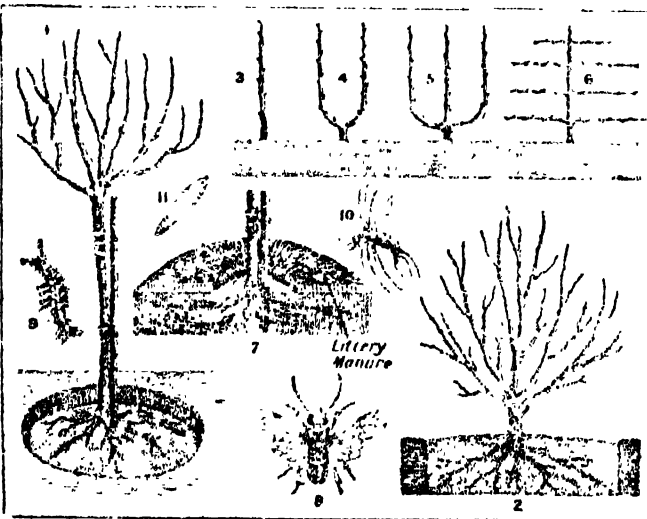
Black spot is one of the worst fungus pests of pears. By this is meant the spotting, generally followed by a cracking, which affects the fruit. It is worst in badly drained soil, but it may be serious in drained land if the soil is poor. Good drainage should be given to the drainage, and the condition of the soil. Spray with Bordeaux mixture in spring.

Caterpillars which attack pears in spring should be combated by autumn grass mowing and spring spraying with arsenate of lead. 1 lb. to 2½ gallons of water. For caterpillars lime salt and lime sulphur sprays generally are effective, but in bad cases the branches should be scrubbed with a paraffin and soft soap emulsion.

Aphides are often troublesome, especially in dry spells. Paraffin and soft soap, or 1 lb. washing soda and 1 lb. soft soap in 20 gallons of water, or 2 oz. commercial nicotine and 1 lb. soft soap in 10 gallons of water will check aphides. The best remedy is the 1-1-1 applied very hot when the leaves are badly curled. Pear-slug is best fought with nicotine, a wineglassful to 3 gallons of water.

Injury to fruit by birds and wasps has also to be thought of. Birds may start picking the fruit before it is ripe. This can be combated with snare to some extent, but netting the trees is the only sure remedy. If there is not a great deal of fruit to deal with, a strip of cotton wool may be tied loosely round the stalk, and it generally answers; but specially fine fruits may be enclosed in large gauze bags, which baffle both birds and wasps. If wasps are numerous, an endeavour should be made to find their nests and to destroy them at night with hot tar or by other means.

Pear Midge. The presence of this pest, which is very detrimental to pear trees,



Pears: their cultivation and the insects that attack them. 1. How to plant a standard pear tree. 2. Planting a dwarf. 3. Pear trained as a maiden. 4. As a double cordon. 5. As a triple cordon. 6. As an espalier. 7. Showing how a newly planted tree should be mulched. 8. Social sawfly. 9. Vapour caterpillar. 10. Pear midge. 11. Grub of pear midge.

By special arrangement with Amateur Gardening



Pear. The variety called Charles Ernest, a dessert pear of fine rich flavour that ripens late

especially the early flowering varieties, usually first becomes evident from the rapid falling of the young fruit when about the size of marbles. Upon examination the freshly fallen fruit will usually be found to be deformed and much distorted. Upon cutting open an attacked fruitlet, a blackened mass of pulp and excreta with a number of the small, whitish yellow maggots will be found.

In small gardens where only bush fruits are grown the best remedy is the handpicking and destruction of all infested fruit, with repeated shallow cultivation of the ground beneath the trees in June and July. In large orchards great benefit has been derived from stocking heavily with poultry in April, May, and June, which is the time when the flies are appearing from the ground, and while the maggots are leaving the fruit.

On light soils an application of kaunit, spread very evenly at the time the maggots are falling, is said to give very good results. Other potash manures will probably answer the purpose as well as kaunit. Spraying the ground or grass beneath affected trees, when the midges are appearing in the spring, with soap and water, 1 lb. soft soap to 10 gallons of water, will kill the midges before they start egg laying. The spraying should be done on dull days or early in the morning. The information given here is taken from Leaflet 26 issued by the Ministry of Agriculture.

Gathering Pears. Pears are ready for gathering when the stalks part readily from the tree under gentle pressure, even if they are not ripe. As a matter of fact, most pears should be gathered before they are quite ripe. Some need to be eaten almost off the tree, but others, including the William and the Jargonelle, are best gathered a few days in advance of full ripeness and laid in a cool room. Gentle pressure with the finger near the stalk affords a very fair clue to ripeness. If the fruit is quite hard and particularly if it has little smell, it is not ready for eating. If it yields a little and has a pronounced aroma it is ready.

Pears that will keep till spring are best gathered in the latter part of October, before severe frost comes; a few degrees of frost will not hurt them. If these late pears are gathered much before mid-October they are apt to shrivel. The fruit keeps well in a dark, cool, sweet, frost-proof place. As a rule, it improves in flavour if it is kept for a few hours in a warm place before being placed on the table.

The amenable nature of pears, which makes them well adapted for formal training and restrictive pruning, renders them well suited for orchard house culture. They do well in large pots, in a compost mainly composed of

fibrous loam. With support in the form of liquid manure while the fruit is swelling, they will furnish excellent crops of splendid fruit.

Uses of the Wood. The wood is hard and heavy with a short and close grain. As it cuts cleanly in all directions it is an excellent wood for carving, but it seasons badly, and without care in the cutting and drying is apt to warp and twist. It absorbs stain well, and as a result most of the dyed stringing and banding material is prepared from it. Mathematical instruments such as rules, tee squares, and set squares are made from it.

Methods of Cooking. For many dishes ripe pears are most suitable, but for baking or stewing, hard green pears are the best.

To bake pears, wipe 6 hard, green pears, but do not pare them; lay them on a tin plate and bake them in a slow oven. They will take a long time to cook. When nearly soft flatten them with a wooden spoon and continue cooking until done. Serve as for baked apples, with sifted sugar sprinkled over.

Stewed pears can be used as the foundation of many dinner sweets. Peel very evenly 4 large stewing pears, cut each in half and remove the core without taking away the piece of stalk. As they are divided plunge them into cold water to prevent them from turning black. When all are finished take them out of the water and put them into a stewing jar or block tin supported with 5 oz. granulated sugar and sufficient water to cover them. Add the thinly pared rind of 1/2 a lemon, 2 cloves, 2 allspice (bruised), and enough coloured to colour the syrup a good pink. Cover them close and stew for 3 or 4 hours. When tender, which can be ascertained by running a straw through one of them, lift them out and strain the liquor over them. If the liquor is very thin, boil it sharply for a few minutes.

Pears à la Ricardo. To make this pretty sweet put the stewed pears into a glass dish, pour the syrup over, and then make a small red jelly. Whip a gill of cream till it nearly hangs on the whisk, into it stir 1/2 oz. preserved ginger cut into small dice, and then blend it lightly with the stiffly whipped white of an



Pears à la Ricardo, made with stewed pears and cream, and decorated with chopped jelly

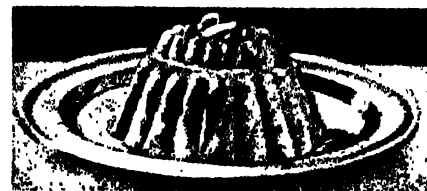
egg. Heap the mixture roughly over the pears, and decorate the top with lines of chopped jelly. 1/2 oz. ratafia.

Pear Conserve. To make this jelly conserve, take 6 lb. ripe, juicy pears, pare them thin, core them, and cut them into quarters. Cook them till quite soft, using a little water. Strain all the liquid out of the pulp through a cloth, or fine hair sieve, as when making other fruit jellies (see page 637). Measure the liquid, and add an equal proportion of sugar. Boil the mixture until a jelly is obtained, then strain into glass jars.

Pear Dainty. Stewed pears also form the foundation of this sweet. To make it, cut a slice from the top of a round sponge cake, scoop out the centre to form a case, and in the meantime stew 1 lb. peeled and sliced pears in sufficient sweetened water to cover them. When they are tender, leave them to cool, and then add 6 oz. ground almonds, putting the mixture into the case. Replace the top of the cake and cover with halves of blanched almonds. Prepare some custard with 2 dessertspoon-

fuls custard powder, 3 dessertspoonful sugar, 1 pint milk, and some almond flavouring, and, when cold pour it round the cake. Whisk the white of an egg to a stiff froth, stir into it 1 gill whipped cream, sweeten and flavour the mixture with almond essence, and pile it high in the centre of the cake.

Pear Mould. To make this, mix dessertspoonful custard powder to a smooth paste with a little milk taken from 1 pint. Pour the remainder, add it to the paste, stirring all the time, and then flavour it with a little vanilla.



Pear Mould, the centre of which is filled with tinned pears and whipped cream

While it is cooling, rub a small tinful of pears through a sieve, then add the pulp, together with 1 1/2 dessertspoonfuls castor sugar, to the custard.

Fold the stiffly whisked whites of 2 eggs into the pulp, etc., and lastly strain in 1/2 oz. leaf gelatine dissolved in 1 gill warm pear syrup. Mix all together, pour them into a border mould, and leave until set. The centre may be filled with some more tinned pears and whipped cream.

PEARL: Real and Artificial. Pearls can be divided into three classes. These are the natural pearls found in certain kinds of shellfish, cultivated pearls which are produced partly by natural and partly by artificial means, and the wholly artificial pearls. The first named are the only ones that may justly be described as genuine, but cultivated pearls are also valuable, and far more costly than the manufactured specimens. Various makes of imitation pearls can be obtained, some of them being patented.

The value of real pearls is determined by their freedom from defects and also by their size, shape and colour. The round ones are the most precious, and next to these rank the button-shaped varieties. Pear-shaped pearls are cheaper, though large and faultless specimens command high prices. Black pearls are rare and costly. They have two lustres, one being grey and the other green. Black hematite, which is used to imitate black pearls, can always be detected by its considerably heavier weight.

Pink pearls are no less valuable than white ones, but they are often peculiarly shaped. Pearls of many other shades of colour can also be obtained, and are seen in great variety in some famous necklaces.

The best deep sea pearls are liable to deteriorate unless they receive proper care. The brilliancy of colour and the lustre which makes a pearl so attractive soon disappears if it is allowed to come into frequent contact with rough surfaces, or to be damped by perspiration which contains uric acid. When the outer surface only is damaged, however, it can sometimes be successfully removed. The underlying layers of nacre will be found still to contain the orient tints, though not with the same degree of lustre or brilliancy as the outer surface. The natural lustre of pearls is often lost through keeping these gems for long periods in jewel cases. A sun bath generally improves them.

The irregular surfaces found on the inside of the oyster shell, mostly semicircular or oval in shape, are known as blister pearls. These are used largely in jewelry in combination with coloured or semi-precious stones, such as amethysts, aquamarines, topazes and tourmalines. The price commanded by semi-

circular pearls is small compared with the amount that would be realized for a spherical pearl of corresponding size.

Cultivated Pearls. People in Japan cultivate pearls by performing a small operation on the oyster, which enables a bead to be introduced into the flesh, and in the course of time the oyster covers the bead with nacre. There is also another method of introducing a bead. This is by cementing it into the shell and leaving it for a year, or several years, until the oyster has covered it with one or several layers of nacre, thus giving the bead a covering which is the same as the exterior of a pearl that might otherwise have taken many years to produce.

These pearls are usually composed of a core of mother-of-pearl, and, except by expert examination, there is no means of detecting them from the naturally formed pearls. Those pearls which are cemented into the shells of molluscs only receive a covering on the upper side; consequently, after they are removed from the oyster, they are cut into half-rounds. These are used for mounting into such articles as rings, brooches and pendants. It has been laid down by English law that these cultivated pearls must not be offered as genuine pearls, notwithstanding that the orient sheen thereon is natural and actually the result of the work of the oyster.

Artificial Pearls. Really good imitation pearls are artistic productions. These are made by covering a solid bead, either of glass or mother-of-pearl, with a series of layers of colloidal, in colour, weight, and outward appearance they are exact reproductions of the best deep-sea pearls. Such pearls can be hardened off so as to give them increased durability and also to enable them to be cleaned by washing with soap and water.

Some artificial pearls are filled with matter obtained from fish scales, and bear an extraordinary resemblance to the real gems. They are made by blowing thin beads or bulbs of glass and then injecting into them a mixture obtained by soaking the scales in water and mixing the sediment that results with some liquid ammonia. It forms a coating inside the bead which gives the latter just the right shade. Melted white wax is afterwards poured in to increase the weight and durability of the bead, and the shiny exterior, in order to hide the fact that it is made of glass, is dulled by the application of chemicals. Such pearls are frequently blown to the irregular shape that distinguishes a great number of the large genuine pearls.

Imitation pearls in necklaces can be detected by the following simple tests, which, of course, do not apply to cultivated pearls. Gently place the point of a needle on the exterior of the pearl immediately above the point where the hole has been drilled. If it makes a mark, or if by a slight movement of the point of the needle it scratches the pearl, then it is safe to assume that it is an imitation with a core of some solid material with a vellum-like covering.

If the needle makes no impression on the exterior, there is a possibility that it is an artificial pearl which has a glass exterior filled with a mixture of wax and fish-scales. A further test should then be applied by pushing the point of the needle gently into the hole of the pearl. If it is one of the filled varieties, the probing will disclose that the interior has a filling of soft material into which the needle point can be inserted. If the pearl is a real one, the needle will make no impression when pushed against any part of the wall of the hole.

Cleaning Pearls. Pearls may appear to lose their lustre and require cleaning. They can be washed in soapuds and lukewarm water and then dried. It is important

thoroughly to dissolve the soap before putting a ring or other piece of jewelry into the lather, and afterwards to rinse it in clean water. It is then dropped into a saucer filled with jeweller's sawdust, which is shaken up and absorbs the moisture on the pearls. The ring is taken from the sawdust and brushed with a camel hair brush or a dry tooth-brush so that no particles of sawdust adhere to the setting. See Jewelry; Necklace.

PEAS: GROWING AND COOKING

How Gardener and Cook can Secure Good Results

In connexion with this subject the reader should consult our article Kitchen Garden. See those on other vegetables e.g. Cabbage, Carrot, Potato; Spinach; also Coral Spot.

Green peas are the most delicious of all summer vegetables, and by making successive sowings from March to June it is possible to produce excellent peas from June until September. Success depends chiefly on correct cultivation of the soil: this must be dug deeply, enriched with manure and not be deficient in lime. After the soil has been dug and manured a scattering of lime may be applied with advantage, especially on freshly cultivated ground, and on old garden land which has been well manured annually during a period of years. On poor or shallow soil peas are not a success: growth will be poor and the yield small.

The seeds should be sown thinly in a double row in a 12 in. wide shallow trench, 1 to 2 in. deep, taken out on land that has been prepared in the way advised. When the earliest rows are 2 or 3 in. high the soil should be drawn up to them with a hoe as a protection from cold winds and to some extent from birds, it may be necessary to protect the seedlings from birds by using the special pea guards, or fish netting. Tall varieties must be staked in good time, for once the seedlings are allowed to fall over they become bent and rarely do so well as others which were supported early.

The dwarf varieties of peas have been improved so much in recent years that many gardeners now grow them almost exclusively in preference to the tall varieties; the latter, however, still yield the largest crops, and if pea sticks can be obtained cheaply or free of cost it pays to grow the taller peas. If, however, pea sticks are expensive in the grower's locality the dwarf varieties of peas are to be recommended.

Some of the best of these are the following which reach a height of about 18 in.: Peter Pan, Laxtonian, Prince Arthur and Little Marvel. Others which reach a height of about 2 ft. are Daisy, Abundance, Stratagem and

Pearl Barley. The grain of barley stripped of its husk and rounded by grinding is known as pearl barley. See Barley.

PEARMAN: The Apple. This class of dessert and culinary apples is of very old standing. Varieties in cultivation include Blue, Adams's, Horned's, Claygate, Herefordshire, and the popular dessert variety Worcester. The latter is an early eating apple of high colour and free bearing. See Apple.

Giantstride. Excellent tall peas are Rentpayer, Senator, of which an illustration is given in the next page, Prince of Wales and Eureka. For a late sowing in June, Autocrat or Gladstone are recommended. The distance between rows of tall peas should be equal to the height of the plants. For an early crop, seeds of a dwarf variety are sown in greenhouse or frame (January), seedlings in March.

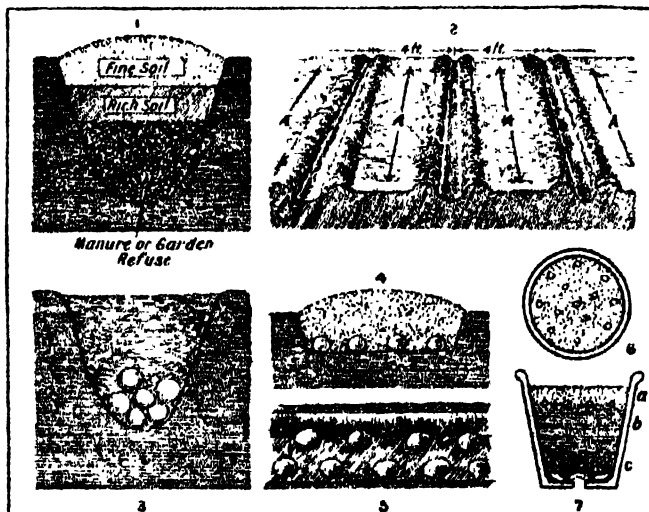
The way to maintain an unbroken succession of fresh green peas is to sow a row every fortnight or so from the middle of March to the middle of May, or even later if necessary. It is a mistake to make one large sowing if peas are wanted throughout as long a period as possible. Quite Contend and V.C., which produce numerous pods, are favourite exhibition varieties.

Diseases of Peas. Peas are subject to a number of diseases. One of these is powdery mildew. The leaves of the peas show yellowish green blotches, which gradually increase in size until the whole of the foliage changes to a yellow colour, and soon withers and dies. When badly attacked a row of peas presents the appearance of having been whitewashed. (For pea pests, diseases, etc., see Ministry of Agriculture Bulletin 81.)

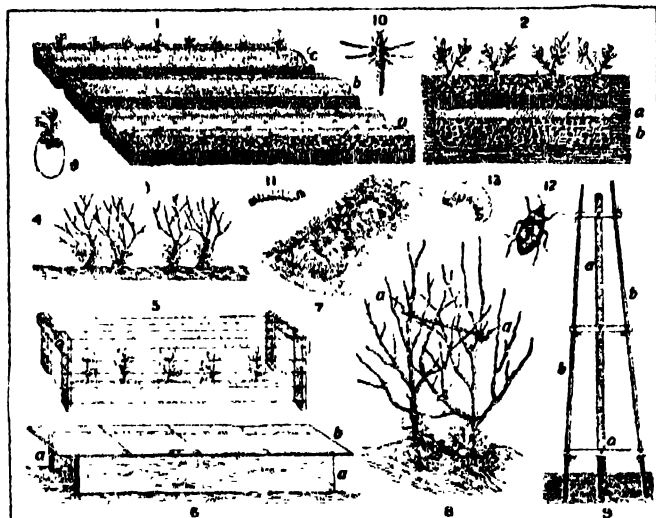
To control this disease spraying is effective, provided it is begun early enough. It should be carried out before mildew appears in June and July, using liver of sulphur, 1 oz. in 4 gallons of water.

Pea mildew, although liable to be confused with powdery mildew, is really quite different from it and requires different treatment. In it the leaves first become covered with a delicate white mould, which soon changes to a pale pinkish-grey colour, and may pass unnoticed until its presence is indicated by the wilting and yellowing of the leaves. The powdery appearance of the mould, characteristic of the other mildew, is entirely absent in this case. When this disease is present the peas should be sprayed with Bordeaux mixture at half strength. This can be made from 1½ lb. of copper sulphate or bluestone, and 2 lb. of quicklime to 25 gallons of water.

Pea Maggot. This is the name of the maggot that infests pods of culinary peas. As soon as the maggots are hatched they gnaw their way through the skin and devour the seed. When the larva is satisfied it leaves the pod and hides in the soil for its pupal stage, emerging as a moth in June, and immediately depositing eggs in clusters.



How to grow Peas. 1. Ideal soil preparation. 2. Sowing drill: A, inter-cropping. 3. Bad method of sowing. 4 and 5. Two good methods of placing seeds. 6 and 7. How to sow in pots: a, fine soil; b, good soil; c, leaves



Peas 1. Sowing in old turves: *a*, sowing method; *b*, seed closed in; seedlings ready for permanent planting. 2. Same in position: *a*, rich soil; *b*, manure or vegetable refuse. 3. Seed sown in egg-shell. 4. Support for young seedlings. 5. Protection from birds. 6. Protection for early sowings: *a*, boards; *b*, glass. 7. Seedlings hoed up. 8. Good sticking: *a*, cross support. 9. Another method: *a*, support for wire; *b*, canes fixed to same. 10. Pea thrip. 11. Pea maggot. 12 and 13. Pea weevil and its caterpillar.

There is no real remedy for the pest, and all that can be done is to sprinkle soot over the foliage in early June evenings.

Pea Weevil. Weevils will attack peas, and if disturbed will instantly drop to the ground and appear dead. The weevils are about $\frac{1}{4}$ in long. Seedlings should have sand and paraffin sprinkled round them, or be sprayed with an arsenate of lead wash.

How to Cook Peas. To boil green peas, first put on a good sized saucepan of water to boil, with sufficient salt, 3 or 4 sprigs of fresh green mint, and 3 lumps of sugar. While the water is boiling, shell the peas, then put them into the water, and cook for 20 min., or according to the age of the peas. Drain them, remove the mint, and dish them in a very hot dish in which 1 oz. margarine has been allowed to melt. Stir them lightly in with the margarine, and scatter on top a little chopped mint.

Green peas are sometimes served with fried or boiled ham, and they make an appetizing dish. The peas should be cooked as for plain boiled peas, except that the chopped mint is omitted on the top. They can be dished separately, and accompany boiled ham or gammon, or the bacon can be fried and laid on the top of the peas. Gammon rashers about $\frac{1}{4}$ in. thick are ideal for this dish. When boiled ham or bacon is to be served with peas they are sometimes boiled in the same saucepan, the peas being added about $\frac{1}{2}$ an hour before the ham is done. This method improves the flavour of each. The ham used should not be too salt, and no extra salt should be used.

Peas can be steamed by placing them in a jar with a little sugar, salt, mint, and 2 tablespoonfuls water, covering the jar tightly, and then putting it into a saucepan of boiling water. Keep the water boiling rapidly for about $\frac{1}{2}$ hour, and add more if necessary.

Cold cooked peas can be used for salad-making. Poach 2 or 3 eggs, cut the edges neatly, and leave them to get cold. In the meantime bind a small teaspoonful of cooked peas with a little mayonnaise sauce, and add seasoning to taste. Place each egg in the centre of a fresh lettuce leaf laid in a salad bowl, put some peas on top, and cover with a little more mayonnaise.

Green pea soup is made by putting 1 quart shelled green peas into a large saucepan with 2 oz. raw bacon cut in dice, $1\frac{1}{2}$ oz. margarine,

1 large onion (peeled and sliced), and a few sprigs of green mint and parsley. Set the pan over a gentle heat and stir well until all ingredients are thoroughly rubbed together, then add 1 gill water and cook until the peas are quite tender. Sprinkle over 1 oz. flour and mix in smoothly. Pour over 1 quart stock which has been flavoured with vegetables, and mash the peas as much as possible against the sides of the saucepan while pouring. Simmer gently for 10 min., then pass the contents of the pan through a wire sieve. Boil up, add more seasoning if required, and 1 gill boiling milk or cream. Serve with dice of toast, also remove fat from the

top of the soup before serving.

Bottled or tinned peas, when required, should be turned into a colander, and washed thoroughly with boiling water. A little mint, butter, salt, and sugar should be added to the pan in which the peas are heated; actual cooking is unnecessary. Packet peas, with which directions for preparing are usually supplied, need to be soaked in boiling water overnight before they are cooked.

PEASE PUDDING. To make this, soak 1 pint split peas overnight, and in the morning wash them, and pick over, and tie them loosely in a large pudding cloth, giving them plenty of room to swell. Boil them for 1 hour, and when quite tender rub them through a coarse wire sieve or colander. Add to them 2 oz. margarine or beef dripping, and season them with salt and pepper. Mix all well together

and tie once more in a cloth, but this time draw it tight round the peas. Boil it again for from 20 to 30 min.

Peasgood's Nonsuch. This is a favourite autumn cooking apple of large size and handsome appearance. See Apple.

PEAT: As Fuel. For use as fuel peat is cut in turves from a foot or two below the surface during the summer, stacked edgewise to dry, and turned every day or two until the drying is complete; this takes 10 to 12 days. It is then carted home and piled under cover in an outhouse, or creted into a rick and roughly thatched for winter use.

The heating value of peat is a little more than half that of a similar weight of coal. It is therefore much bulkier in proportion to the time it burns, and large wooden peat vases, twice the size of the average coal scuttle, are placed in rooms where it is burnt to hold it, and refilled once or twice a day. Peat makes very much less dirt than coal, and has a pleasant fragrance when alight, but owing to the rate at which it burns it requires more frequent attention than is given to a coal fire.

When lighting a peat fire it should be remembered that it will not catch from paper. A good handful of thoroughly dry wood is needed to start it, and very little peat should be added until the wood is well alight. Large unbroken turves should never be put on to a newly lighted fire, or they will extinguish it. The proper plan is to break them up small between the fingers, and to feed the fire with them gradually, giving entire attention to it for the first 10 minutes.

When the fire has well started the hearth should be piled up with large sods of peat, using plenty of them. They will appear at first to kill the blaze, but it will soon shoot up again. If possible a proportion of coal should be used, starting the fire well with coal, and then piling the peat up high over it. Such a fire will last well, look very cheery, and throw out a great deal of heat. A pair of bellows should never be absent from a peat fireside; they put new life into the fire when it dwindles unexpectedly. See Fire, Fuel.

PEAT: For Garden Use. A soil which is made up chiefly of decayed leaves and other vegetable matter is known in gardening as peat. It represents the early stages of the transition of wood into coal. It needs to be mixed with loam and sand for ordinary plant culture. It is used extensively as a mulch.

PEBBLE WARE. This is a term used by Josiah Wedgwood to describe earthenware products in which the effect of crystalline rocks was imitated by means of differently coloured clays. In these materials he turned out flower-pots, basins, plates, inkstands, and candlesticks, but especially vases, all simulating natural crystalline stones.

Egyptian pebble was made of coloured clays, with veining; when spotted with blue it was called variegated pebble. Some of the specific imitations, such as verde antique, agate, porphyry, serpentine, and granite, always bore these names, although they are all varieties of pebble ware. The earliest pieces, made by colouring cream bodies, can be distinguished by the light tint of the edges. Afterwards the veining was made to run through the substance by means of bands of clay incorporated in the paste. See Jasper Ware; Wedgwood.

PÊCHE MELBA. A fancy name for ice cream made with peaches is pêche Melba. The peaches are divided in half, stoned, and steeped in liqueur, with a sprinkling of sugar added. They are served with a surround of rich ice cream, and garnished with whipped cream arranged in the centre. See Ice.



Peas. Specimen pods of a popular green pea the variety known as Senator

PECK. This measure of weight is used for potatoes and other vegetables; also for fruit. Ordinarily, a peck consists of 14 lb., and four pecks make a bushel. Apples, however, are usually added 10 lb. to the peck, and onions often 12 lb. See Dry Measure.

PECTIN. This is a substance allied to gum which is found in ripe fruits and causes jams and jellies to set. Before cooking it exists as pectose, and is converted into pectin by the heat of the process. If too much heat is employed the pectin is changed in character and no longer gelatinizes the jam. On this account too much boiling should be avoided in the preparation of fruit jams.

Apples and gooseberries contain more pectose than soft fruits such as raspberries, strawberries, and plums, and this is why strawberry or other jam often contains a small proportion of apple or gooseberry pulp or juice. Unripe fruit contains very little pectose, hence the necessity of employing only ripe fruit in jam making. The setting properties of crab apple jelly are due to the large proportion of pectose contained in crab apples. A pectin preparation for adding to jams and jellies when making these can be obtained at grocery stores. See Jam - Jelly.

PEDIMENT. This word meant originally the triangular finish placed over the cornice that rested on the column of a Greek temple. It thus resembles the gable in Gothic architecture. Its chief use to-day is in connexion with furniture, being seen on English furniture most usually in the form of a broken pediment. The tops of bookcases and cabinets have the sides of the triangle, that would otherwise reach an apex, stopped short of it. This form of pediment was used by Chippendale and is seen in Georgian style room over doors and fireplaces. Occasionally the pediment takes another form, a semi-circular one is on the mirror, Fig. 1, illustrated in page 787 See Door; Georgian Style.

Pedlar. See Hawker.

PEEL. Peel is a skin or rind, the word being especially applied to the skin of fruit. This skin should in most cases be removed before the fruit is eaten. Certain peels, e.g. that of the lemon, have many culinary uses. See Candied Peel; Lemon.

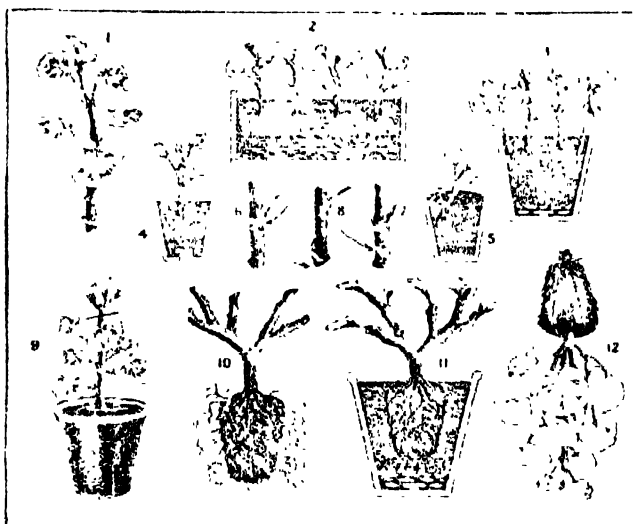
PEGAMOID. This is a substitute for leather, and is used for upholstery. It is easily cleaned with soap and water, and kept in condition with ordinary furniture polish. Like all leather surfaces, it becomes cracked with continual use, if treated with one of the specially prepared paints sold for the purpose, the surface can be rendered equal to new. See Upholstery.

PEKINESE DOG. The Pekinese is an affectionate little dog, purely domestic and of engaging manners. Its head is broad and flat between the long, drooping, heart-shaped ears, the muzzle short, broad and wrinkled, and with the broad nose black. The large dark



Pelargonium Ivy-leaved variety in a terraced vase

eyes are round, bright and prominent. The body, broader in front, has a dense undercoat covered with rather coarse though soft, long flat hairs, the legs, feet and tail profusely



Pelargonium. Method of culture. 1. Suitable cutting. 2. Cuttings in a box. 3. Cuttings in a pot. 4. Single cutting potted right. 5. Cutting potted wrong. 6 and 7. Cuttings wrongly prepared. 8. Cuttings correctly taken just below a joint. 9. Where to pinch to secure bushy plants. 10. Plant with old stem pruned and soil-ball reduced. 11. Same repotted to provide cuttings. 12. How to hang old plants during the winter.

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leathered. Any colour is allowable, self or patched, but the golden-tan, self-coloured dogs are the truest to type. The maximum weight is 10 lb., but smaller dogs are more desirable (minimum 5 lb.). See Dog; Kennel.

PEKOE. The fine variety of China tea known as Pekoe is very suitable for mixing with Indian, Ceylon, or other teas. The leaves are picked when the plant is young, and has the down upon it. From the pleasant aroma of this tea it is often called the flowery Pekoe. See Tea.

PELARGONIUM. The two most popular kinds are the ivy-leaved and the zonal pelargonium, the latter being commonly but erroneously known as zonal geraniums. Both are valued for planting in summer beds, and the ivy-leaved varieties are well suited to filling vases in the flower garden or hanging baskets in a porch, veranda or window box.

They are propagated by cuttings taken from flowerless shoots in August, inserted in pots or boxes of very sandy soil and placed in a cold frame. During the winter the cuttings must be kept in a greenhouse heated suffi-

ciently to keep out frost: a temperature of 45 to 50 degrees is high enough to ensure their safety. In autumn or in spring the rooted cuttings are potted singly in 3-in. pots in a compost of sandy loam; they may be repotted in 5 in. pots before being hardened off ready for planting out of doors early in June.

The old plants should be lifted early in October, if placed in pots or boxes of soil and kept under glass safe from frost in winter and spring they may be planted out in June. Old plants are useful for garden vases and for filling the centres of flower beds. A method sometimes employed by those who have no greenhouse is to shake the roots of zonal pelargoniums free from soil in autumn and hang them, roots downwards, in a cellar or other frost-proof place for the winter; it is however less satisfactory than potting them and keeping them inside a room window.

A few of the best varieties of zonal pelargonium are Paul Crampel, red; King of Denmark, salmon; Henry Jacoby, crimson; Queen of the Belgians, white. There are innumerable others. Two favourite varieties of ivy-leaved pelargoniums are Madame Grosse, salmon-pink; and Souvenir de Charles Turner, carmine-rose.

Certain pelargoniums are grown for the sake of their coloured leaves, but they are less popular than they were some years ago. Flower of Spring, green and white leaves; Crystal Palace Gem, yellowish leaves; and Swanley Bronze, with bronze coloured leaves, are some of them. Then there are the tri-coloured pelargoniums, of which Mrs. Pollock is a great favourite.

The show and fancy pelargoniums are still favourite plants for cottage windows where, during the summer months, they may be seen in full beauty in almost any part of the country. They are valuable for conservatory decoration. When the flowers are over the plants should be partially dried off by giving less water for 3 or 4 weeks; the

shoots are then cut back, the plants repotted, and grown in a cold frame until autumn, when they should be placed in a slightly heated glasshouse. Cuttings made from the fresh shoots will form roots in pots of sandy soil in a frame.

Scented-leaved pelargoniums are rarely seen nowadays, but they are worth adding to a collection of greenhouse plants, for they are easily grown in a temperature of about 50 degrees if potted in sandy loamy soil.

Zonal pelargoniums will flower in winter in a greenhouse temperature of 55 to 60 degrees if they are



Fine head of a zonal pelargonium



Pekinese Dog. Prize-winner of this favourite breed of long-haired toy dogs

propagated by cuttings in March. During the summer months the plants must be grown in a cold sunny frame and all flower buds should be picked off. In late September they should be placed in the greenhouse. The final potting is in 5 in. or 6 in. pots, using a compost of turfy loam with a little sand and decayed manure. See Geranium.

PELMANISM. This game depends largely upon the memory. It is played with a pack of ordinary cards, which, instead of being dealt in the usual way, are laid face down upon the table unsymmetrically, each card separate. The first player turns up a card, shows it to the others, and lays it down again in the same place, face downward. A second card is treated in the same way. Subsequent players turn up a card, and if a similar card has already been turned up they can pair it off, providing they can remember its position. If they succeed in pairing the two cards, are then removed from the game. This is done by each player in turn, and the one who has most pairs at the end of the game is the winner.

PELNET. This is the furnishing accessory which surmounts the curtains of a window and hides the pole or rod and rings. Woven fabric pelnets are usually of the same material as the curtains, but occasionally a contrasting treatment is employed by making the pelmet to match an appliqué trimming or border. In such a case the pelmet is often trimmed with appliqué of the material used for the main body of the curtains. The difference between a textile pelmet and a valance is that the latter is pleated or gathered, while the former is shaped to fit. It may be trimmed with a fringe, scalloped or stepped or beaded, or curved at each end as shown in Fig. 1. It requires lining with the same material used for the curtain, or to tone with them, and often it is to be interlined with canvas. The pelmet is sewed on to a pelmet board, as illustrated in Fig. 2 below.

Many window treatments now incorporate a pleated wooden or metal pelmet. Mirror glass is used divided into sections which are held in position with silver-headed nails or glass studs. Coloured glass which matches the colour of the curtains is effective for pelnets. Oak or painted wood moulded pelnets are also seen, while designs in plywood are suitable for bedrooms and modern bungalows. Aluminium and chromium plate are also used for this purpose. The advantage of hard surface fabrics for pelnets is that they do not require to be taken down when the curtains are changed, but are simply cleaned with a damp cloth and polished. Illustrated ideas for pelnets are seen in page 71, and in the article on Curtains.

Pelmet Board. This name is given to the support which holds a pelmet or a pleated valance in position. It consists of a strip of wood that is sometimes provided with a wide moulding on the front edge and ends. The pelmet is attached either directly to the front edge or behind the moulding. In addition, the rods on which the curtains are hung are generally attached to the pelmet board. An illustration of a pelmet fitted to a board with a moulded front is shown in Fig. 1. The side view in Fig. 2 gives a section showing how the moulding may be attached to the board and the position of the silk pelmet and curtain rod, which is held in position with screw hooks. Small iron brackets are used to secure the pelmet board in its proper position. See Bay Window; Curtain; Living-Room; Mirror.

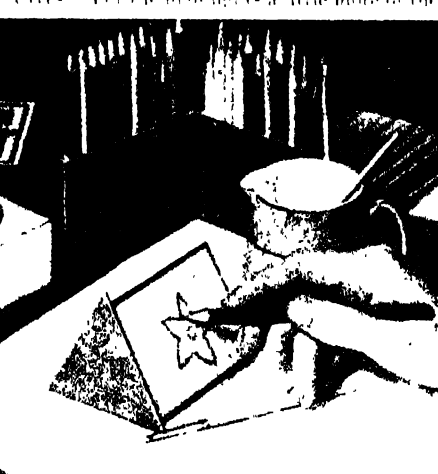
PEMBROKE TABLE. This is a name given to an oblong table with two leaves, which may either hang down or, supported by brackets, be raised to the level of the rest of the piece. The leaves may be either oblong or semicircular, and the table is made in oak and mahogany, as well as in the cheaper woods. Pembroke tables of the 18th century have frequently edgings of marquetry, and on some is the serpentine line favoured by Hepplewhite and his followers. See Table.

PENCIL PAINTING. Pencils specially prepared for this work are known as Aquapencil and are obtainable in 24 colours. They may be used dry, as ordinary coloured pencils, or with water and a brush when pencil painting can be accomplished on paper, textile fabrics, leather and wood.

There are two methods of working the colours. Part of a design is filled in with the desired tint as if using an ordinary crayon, and then spread and smoothed with a brush dipped in water. This results in beautiful clear wash effects of non-fading colour. The other method of application is to damp the paper or part of a design on a piece of fabric, slightly with a clean, wet brush, and then draw in with strokes of the pencil the colour required. Unless there is an excess of water the colour

will not run, but in this way shades can be softly blended.

To make a strong outline the pencil itself is dipped in water and used as shown in the illustration. The conventional design on a parchment-covered spill holder is being filled in. Colours may be superimposed and may be distributed over large surfaces by means of a piece of damped felt wrapped round the index finger.



Pencil Painting. Continuing the design on a parchment spill holder with a water-colour pencil. The boxes have been decorated with pencil colours applied dry and spread with a brush dipped in water.

white pencil was used over the colour. Leather is pencil painted in the same way as wood. For other work, to ensure against wear, spray with an ordinary solution of shellac and alcohol, or brush over with clear varnish to protect the design.

PENDANT. An ornament hung, usually, from the neck, such as a locket and chain. The most valuable are made of gold, and set with diamonds, sapphires, and other precious stones, or they can be of platinum and pearls, or rolled gold, or enamelled silver.

Another type is of carved or plain amber, jade, or ivory. It may form part of a necklace composed of beads to match, with or without metal chainwork or filigree connecting links. Other pendants are usually worn on chains which match the metal of which they are made. A pendant suspended from a small chain attached to a brooch is sometimes worn as a lapel ornament on a coat or costume jacket. See Jewellery.

PENDULUM. A clock depends for its timekeeping upon the proper working and adjustment of the pendulum. The motion of a pendulum is controlled by the laws of gravity. If free from friction and atmospheric pressure, it would swing for an indefinite period at a uniform rate. The time of vibration of a pendulum depends entirely on its length. It is the same for a given length whether the pendulum swings through a long arc or a short one, the velocity being proportionate to the height the pendulum falls in passing. The length is the distance



Pendant. Eighteenth-century piece in gold set with diamonds.

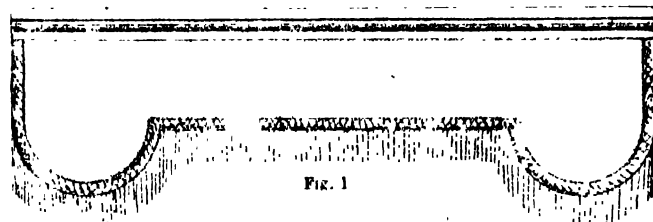


Fig. 1

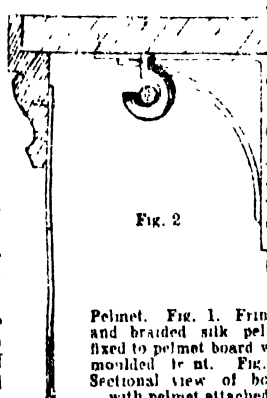


Fig. 2

Pelmet. Fig. 1. Fringed and beaded silk pelmet fixed to pelmet board with moulded front. Fig. 2. Sectional view of board with pelmet attached.

will not run, but in this way shades can be softly blended.

To make a strong outline the pencil itself is dipped in water and used as shown in the illustration. The conventional design on a parchment-covered spill holder is being filled in. Colours may be superimposed and may be distributed over large surfaces by means of a piece of damped felt wrapped round the index finger.

The simplicity of the outfit will appeal to many people, and pencil painting is a delightful and clean method of colouring for children to use. It is excellent for sketching or for map tinting, and may also be used for colouring photographs on either dull or glossy paper. For this last purpose the pencil is applied dry, and the markings are then gone over with a damped brush. If too much colour is applied, or it is put in the wrong

from the point of support to the centre of gravity of the pendulum bob and rod; the shorter the rod the greater the number of the vibrations. Lengthening the rod reduces the speed of the clock, and shortening the rod increases the speed. The length of a seconds pendulum is taken as the basis: in the latitude of London this is approximately 39.14 in. and a rod of this length will make 60 vibrations per minute, or in other words will take one second to swing from one side of its stroke to the other. Cheap clocks generally run at a speed of 120 or more, hence the pendulum must be shorter than 39 in. in length.

The length of pendulum arranged for a clock is governed, as a rule, by the amount of room available in the clock-case. The clock, through its wheels and pinions geared up to suit the length of the pendulum, transmits the number of vibrations in the form of seconds, minutes, and hours, recorded on the dial.

Ordinary pendulums vary slightly with changes of temperature, which cause the metal rods of which most of them are made to expand or contract, thus lengthening or shortening the pendulum, with the result that the clock goes slower or faster. Where very accurate time is required, this effect is greatly reduced by the compensating pendulum, of which there are two principal types. In one, the simple pendulum rod is replaced with bars of dissimilar metals placed side by side, each bar being connected at the top to its neighbour on one side and at the bottom to the other neighbour. Since the different metals expand unequally, and the arrangement of the bars cancels the upward expansion of one bar by the downward expansion of another bar, the length of the assembly remains practically constant through wide temperature changes. The other compensating method uses a drop cup of mercury as the bob. The amount of mercury is so proportioned that expansion or contraction in heat or cold causes it to lift or lower its mass in compensation for the lengthening or shortening of the rod.

The nickel alloy invar, which, having the lowest known coefficient of expansion, is hardly affected by even small temperature changes, is often used for making high-grade pendulums. A wood rod, french polished, with a lead bob, also makes a good pendulum, as wood is not much affected by temperature. The spring by which a pendulum is suspended should always be as thin as possible.

Regulating the Pendulum. The regulating of a clock consists in getting the pendulum to make the correct number of vibrations so as to record the right time. This is done by lengthening or shortening the pendulum. In most clocks the bottom part of the rod is fitted with a screw, on which is a knurled nut. On this nut rests the bob which slides up or down on the rod, so that by turning the nut the bob is raised or lowered as required. In doing this, great care must be taken not to buckle the suspension spring, as a distorted spring will very often cause bad timekeeping. A good plan is to hold the bob with one hand and turn the nut with the other.

When a clock requires regulating it should first be noted how much it is out in a given time. The pendulum should be altered accordingly, shortening it to make the clock go faster, and lengthening it to make it go slower. The result should be watched to see what difference the alteration has made over the same period, and from this it will then be possible to gauge exactly what further alteration is required. A long pendulum will require moving a greater distance than a short one for the same error. Some clocks are provided with a means of regulation from the front of the dial.

French clocks use what is known as a Brocot regulator. Over the top of the figure 12 is a

small square which is turned with a key that works a slide up and down the suspending spring of the pendulum. On account of backlash between the two toothed wheels employed, this device is often not very reliable, and the slide should be observed to see just how much it is moved by turning the key. English clocks use a different method, known as a rise and fall. This is a rocking bar across the top of the clock plate, the pendulum being hung on one end, the other end working on an eccentric snail at the back of the dial, with an arbor through the dial to which is fixed a pointer or hand. By turning this the bar is moved up or down, by this means drawing the suspension spring between two brass jaws underneath the bar. See Clock. Grandfather Clock.

PENICILLIN. A powerful healing agent produced by certain moulds. It is used in treating wounds, blood-poisoning, and certain bacterial infections such as anthrax, tetanus, diphtheria, gangrene, meningitis, and puerperal fever. Normally, it is administered by injection into the bloodstream through a vein, but for burns or flesh abrasions it is applied externally as an ointment or powder, and for certain eye infections in droplets. Penicillin should only be used on medical advice.

PENNYWEIGHT. This measure is used in Troy weight, 24 grains going to a penny weight. 20 pennyweights make an ounce. The usual abbreviation is dwt. See Troy Weight.

PENNYWORT. Sometimes called navelwort, and botanically known as *Cotyledon umbilicus*, pennywort is a succulent plant which may be found growing wild in crevices of rocks and ancient walls in the west and south west of England and Wales. It has orbicular leaves and bears erect spikes of drooping cylindrical yellowish-green flowers during June. Its rounded fleshy leaves have depressed centres. It is useful for wall-gardening and for outdoor ferneries, but requires mild climatic conditions.

PEN PAINTING. This form of decoration can be applied to cotton, silk, velvet, leather, papier mâché, wood, pottery, glass and metal. Oil colours are used with a special powder and medium, pens, palette, palette knife, drawing pins, drawing board, and a sheet of clean white blotting paper are also required.

When used on textile fabrics care is necessary to prevent spreading of the oil colour. This may be achieved by removing the work from the drawing board immediately the pen painting is finished and placing it on a sheet of clean blotting paper which has been dusted over with absorbent powder. The back of the silk or other fabric must touch the powder while the colours are drying and this prevents their tendency to spread.

Wooden articles to be decorated in this manner should be lacquered or enamelled first, the design being pounced on when the background is quite dry. Glass and pottery must be washed, rinsed in cold water, and

polished with methylated spirit. Colours will not adhere to a greasy surface. Stencilled designs may be outlined in pen painting.

Floral and conventional designs are the most suitable for pen painting. The finished appearance of the work has some resemblance to embroidery as the strokes of the pen by means of which the colours are laid on take the form of stitches.

The first step is to trace the design on to the fabric in the case of textiles, to pounce it on for wood or to paste it on the reverse side for pen painting on glass (see page 534). Designs can also be placed under gauze, which is an admirable fabric for pen painting. Black gauze mounted afterwards on satin is effective when pen painted for central pieces on nightdress, glove or handkerchief sachets.



Fig. 2. Glass vase decorated in pen painting with design of mimosa in natural colours.

In white it is used for dessert doilies, such as those illustrated in Fig. 1. Silk gauze is obtainable for the work by the yard or in pieces, also traced doilies and table centres for pen painting.

Special oil colours are sold for this purpose. A

convenient method of mixing is to squeeze a little white on to the palette and mix the powder with it till it is of the consistency of thick cream and no specks of free powder are left. The white is then tinted a very pale shade of the colour required and a third of it put aside. The remainder is tinted a deeper shade and half of this is put aside, while the part left over is coloured a still darker shade. This gives a medium tone for a flower, leaf or groundwork, a pale tone for high lights and a dark tone for shadows. The various colours may be prepared in this way, and a drop of medium should be added to each before starting work.

The three shades of a colour actually in use may be placed on the blade of an old table knife. A long, thin piece of colour is then modelled on the knife and picked up with the pen and applied to the fabric as if making a down stroke in writing, a slight but even pressure being maintained. This is followed by further strokes until the design is filled in; the darker and lighter tones of the colours being used for the high lights and shadows. Practice soon teaches the worker just how to gain good effects from the direction of the strokes. A set of dessert doilies with a different flower on each one is an excellent piece of work to undertake after experiments have been made on a few scraps

of silk or cotton to gain some skill with the strokes. English and French makes of pens are obtainable for a few pence a dozen. Bronze and lustre powders can be used to give a richly varied appearance to designs. The former are painted on finely with a No. 1 sable brush, using the quick-drying medium supplied for them. The latter are dusted over portions of the work, while still wet, to



Pen Painting. Fig. 1. Two of a set of dessert doilies, each of which is decorated with a different flower.

give a raised effect. For instance, they were used to give a touch of realism to the mimosa leaves and flowers on the glass vase in Fig. 2. The leaves were worked first in greens and while wet covered with green lustre powder. When this was dry enough for the surplus powder to be shaken off, the mimosa was painted in with the pen in chrome yellow and white. This was covered with yellow lustre powder to give the fluffy look to the mimosa balls.

One advantage of pen painting is that it can be done rapidly. It takes some time to dry, however, one week being the usual time allowed in winter. Afterwards the work may be brushed, washed, or rubbed without harmful results. If the colours fade with time, they can be freshened by a second but light application of paint after the surface has been cleaned. See Stencilling; Transfer.

PENSION. A pension is really an annual payment made to elderly or infirm persons in recognition of past services. Officers of the army and navy and civil servants enjoy pensions if they have served a certain period, and many businesses have pension schemes for their employees, among these being the banks and insurance companies. Many local authorities such as town and urban councils, have also pension schemes, and pensions are also provided by some trade unions.

Pensions are either contributory or non-contributory. Those given by the state to officers and civil servants are non-contributory, i.e. no deduction is made from the salary on this account. Most of the schemes are contributory, i.e. the employee pays from his salary a certain amount each week, month, or quarter towards his pension, usually something from 3 to 5 p.c. If he dies before he becomes entitled to a pension, his relatives, in most cases, receive the amount he has paid in to the fund. In some schemes the firm pays a sum equal to the total contributions of the employees; in others it makes itself responsible for the whole, except that part paid by the employee.

The amount given as pension varies, depending upon the salary received and the length of service. In the civil service the maximum pension is one-half the salary for 40 years' service. In addition, however, a substantial sum is given to the retiring civil servant in the form of a gratuity. The pension is calculated, moreover, on the salary received at the time of retirement, i.e. when it is highest. Other pensions are usually calculated according to the length of service with a maximum of two-thirds of the annual salary. Some pension schemes, but not all, provide pensions for the widows of employees. These may be as much as one-third of the salary.

State Schemes. In the United Kingdom of Great Britain and Northern Ireland, and also in other parts of the Commonwealth, there are state schemes for providing pensions.

In Great Britain, state retirement pensions are paid, irrespective of means, to an insured man at 65 years of age; to his wife at 60, and to an insured woman at 60. The pension is payable only on retirement from regular, normal employment by men 65 to 70 years of age and by women between 60 and 65. Full retirement pension is 30s. a week for an insured person, 20s. a week for an insured man's wife. The insured person must have paid 156 weekly contributions, and have had a yearly average of 50 contributions. A person qualified for a retirement pension can increase the pension by 3s. a week for each year in employment up to five years beyond retirement age.

Firms wishing to establish a pension scheme should consult an actuary, as only an expert who is acquainted with the conditions of the business in question can estimate its cost. For purposes of income tax, pensions are treated as earned income. See Annuity; Income Tax; Insurance; Old Age Pensions.

PENTSTEMON. This is an invaluable hardy or half-hardy plant suitable for the rock garden and flower beds and borders. The florists' varieties of pentstemon are popular late summer flowers; new ones are raised annually and the size and colouring of the blooms have been greatly improved; they vary from white through pink to scarlet and through rose to carmine and purple. The plants are about 2 ft. high and are very showy from July onwards. Catalogues give long lists of named varieties. The small flowered section of pentstemon has become popular in recent



Pentstemon, a showy plant for the garden border

years. The plants are of slender, graceful growth, about 18 in. high and bloom freely; a few of the best are Newbury Gem, Southgate Gem and Myddleton Gem.



Peony two beautiful varieties. Left, flower of the fragrant white herbaceous aliflora; right, rose-shaped flower of a variety of tree peony



The usual method of propagating the named varieties of pentstemon is by cuttings of flowerless shoots inserted in a bed of sandy soil in a cold frame in September; if the frame is kept closed for a few weeks they will soon form roots. The plants may remain undisturbed until April or early May, when they are planted out of doors. A better plan is to pot them singly in 3 in. pots in spring. Pentstemons can be raised from seeds, and those who do not wish to possess certain named varieties will find this method satisfactory if seeds of a good strain are obtained.

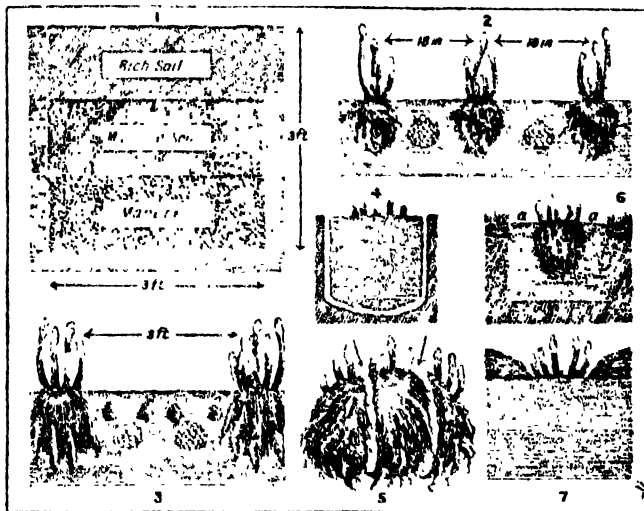
From seeds sown in a heated glasshouse in January or February the plants will bloom the same year. A summer sowing in a garden frame will yield plants that will flower the following year. The florists' varieties of pentstemon are not thoroughly hardy, therefore annual propagation is advisable. Plants in warm, sheltered places may live through the winter; if they do they ought to be pruned in spring.

Among the species or wild types of pentstemon there are several beautiful flowers. The loveliest of all is the blue heterophyllus, which needs well drained soil and is suitable for the rock garden. Barbatus, 3 ft., is a good border plant which bears red flowers in late summer.

PEONY. There are two kinds of peony, one a hardy herbaceous perennial, the other a shrub commonly called tree peony. The former is of chief value in British gardens. There are innumerable varieties with single or double flowers in many charming colours, and well established plants provide a brilliant display of bloom in May and June. These plants thrive best in deeply cultivated soil which has been enriched with decayed manure; they must be watered freely in dry weather, and an annual mulch or soil covering of manure in spring is beneficial. The best time to plant is in September-October. Peonies are often slow in becoming established; they should therefore be left undisturbed as long as they continue to flourish. When after some years they become overcrowded the roots should be lifted, separated into pieces in early autumn and replanted.

The old crimson peony, often called which has reddish shoots in spring and bears large, handsome blooms, and the white aliflora are still deservedly popular and should be included in every collection. Growers catalogue lists a large number of varieties which have been raised by cross-breeding.

The tree peony, *Paeonia moutan*, from Japan, and its varieties (which bear chiefly Japanese names) are shrubs several feet in height, which bear large, handsome blooms in early summer. Although these shrubs are



Peony Culture. 1. Good soil preparation. 2. First year: planting with lilies between. 3. Second year: middle plant removed, tulips and lilies between. 4. How to lift a plant. 5. How to divide. 6. Planting in grass: a rich compost. 7. How to mulch a peony plant.

hardly they start growing early in the spring, and should therefore have a sheltered situation, preferably one facing south or west. *Paeonia lutea* is a tree peony from China, and cross-breeding between this and the Japanese tree peony has produced new varieties. See *Colour Plate* facing p. 845.

PEPPER : The Plant. The pepper plant belongs to a family of hothouse and greenhouse shrubs of the genus *Piper*. In Great Britain they are cultivated chiefly for their foliage. They require stove culture in a mixture of loam, leaf-mould and sand, and need a temperature varying from 60° to 80°, according to the period of the year. Propagation is by cuttings in springtime. The flowers are insignificant.

PEPPER : The Condiment. Both the white and black pepper are obtained from the seed of the Indian pepper plant. The white variety, which is less pungent than the other, is produced by allowing the berries to ripen more fully, is used as a condiment for the table, but the black gives the best results in cooking.

Cayenne and Other Peppers. Cayenne pepper is employed in sauces and for seasoning white-meat dishes; it is also served as a table condiment. It is obtained from the dried berries, and the preparation may be undertaken at home.



Pepper grinder in painted porcelain and silver. The peppercorns are inserted in a semicircular groove at the top, and ground pepper is sprinkled from the base.

Open the pods, remove the seeds, and pound them in a mortar with 1 lb. of their weight in salt. Sometimes a small portion of white pepper is added. Dry the pulp thus obtained, pass it through a sieve, and preserve in bottles corked tightly. About 10 chillies are needed to make 1 oz. cayenne pepper. Nutmeg, karanja, and cardamom are other varieties of red pepper. Long pepper is imported from India, and Noddyberry pepper is prepared from a yellow variety grown in the Noddy hills. It is usually mixed with cummin and other aromatic spices. Mignonette pepper is a coarse-ground rather whitish variety, mild in character.

Medical Uses. Pepper has various uses in medicine, either as a counter-irritant, a stimulant, or to prevent flatulence, but must be taken in small quantities, otherwise it will set up irritation of the stomach and other organs. It may be used instead of a mustard plaster by steeping black pepper in alcohol, then spreading it on brown paper, covering with muslin and applying it to the skin for a few minutes.

Where a stimulant is urgently needed, and no brandy, sal volatile, etc., is at hand, pepper will supply the want. Give about 15 gr. of ground black pepper in milk; it will act as a powerful restorative.

Peppercorn. This is the seed of the pepper plant, before being ground, and it is valuable for the adequate seasoning of stock and stews. In order to distinguish the quality, observe that the seeds or corns are not broken. They should be whole, firm, and clean-looking. See *Allspice*, *Capsicum*; *Chilli*.

Pepper Pots. Pepper pots, or castors, are made of various materials. Cut glass ones, with silver tops, are found in condiment sets, and there are aluminium ones for kitchen use. They are also made in earthenware, generally as part of a set. For the dining room pepper pots are made of silver, Sheffield plate, and electro-plate, and are usually bought in pairs to match salt cellars and mustard pots.

Pepper pots of silver were first produced about 1700. They were cylindrical in shape, with a curved or domed top, which was perforated. Later the vase design was used for them, and, known as castors, they were made to form part of a set of three, two being for pepper and one for sugar. Pots in Sheffield plate were at first made on the same lines as those in silver, but afterwards other features were introduced. Some of the pieces were pierced, and, like the salt cellars, were fitted with glass liners. Bead edging is found on many of the antique pepper pots, which are sometimes called dredgers or mullineers. See *Mullineer*; *Sheffield Plate*; *Silver*; *Table Laying*.

PEPPERMINT. This hardy perennial herb may be grown in any rich, moist soil, and is well suited for the rock garden, or in rockwork by the side of a sunken walk. The flowers and young foliage should be gathered for the purpose of distillation. Peppermint should be freely and constantly watered in dry weather.

Essence of Peppermint. Extract of peppermint is used for flavouring certain kinds of sweetmeats and digestive lozenges, while the essence is made into coughs. A favourite dessert sweet consists of mild peppermint creams made with fondant and coated with unsweetened chocolate.

Medical Uses. The fragrance and stimulating properties of peppermint are due to an essential oil which gives it a value as a medicine in digestive troubles. It is given to infants in the form of peppermint water in doses of

1 teaspoonful several times a day. One or 2 drops of oil of peppermint on a lump of sugar will generally give relief in cases of flatulence.

Indigestion can frequently be relieved by taking a strong peppermint lozenge after a meal. These lozenges can be obtained in a variety of different degrees of strength, suited to all tastes; but when required medicinally the extra-strong ones should be used. For these purposes peppermint is usefully combined with bicarbonate of soda, as in soda-mint tablets. There is also a spirit of peppermint, the dose of which is 5 to 20 minims.

Peppermint Cordial. In order to make peppermint cordial, simmer 1 lb. loaf sugar with 1 pint boiling water for 10 min. One tablespoonful honey should then be added, and when the mixture is nearly cold 30 drops essence of peppermint. It should then be bottled.

Peppermint Cream. See *Sweets*.
PEPPER'S GHOST. The illusion which is known as Pepper's ghost is quite easy to produce. Take a large piece of clean glass, and incline it on a stage at an angle of 45°. The person to be reflected must stand in a hole or pit below the sheet of glass, with a strong light falling on him, but so that he cannot be seen by those who are watching the performance. His image will be clearly reflected from the glass, and he will seem to be behind it, thus producing the striking illusion of a ghost. This is the basis of many more elaborate illusions. See *Children's Party*; *Stage*.

PEPPER SPICE. A spice which may be used to flavour stuffing, giblet, etc., can be made from 3 tablespoonfuls each dried bay leaves and dried thyme, 2 tablespoonfuls each dried marjoram and rosemary, 10 tablespoonfuls each grated nutmeg, powdered mace and black pepper, and 1 teaspoonful cayenne. Stalk the herbs, then pound them with the spice and pepper to a fine powder. Rub the whole through a fine sieve, then put it into dry, well-corked bottles.

PERAMBULATORS AND PUSH CARS

Up-to-date Types and Some Notes on Repairing

Reference should also be made to the articles *Baby Nursing*, and others dealing with child life. See also *Ball Bearings*, *Lubrication*, and *Tire*.

The shape and design of baby carriages have changed of late years, the older high-built type of pram having been superseded by cars having a much lower built body and smaller wheels. The deep, low-built body affords the infant more protection from draughts, and keeps the weight low down and minimises the risk of over-balancing.

The chief requirements for a baby carriage are safety, comfort, and strength. It is essential that the carriage should be well sprung. The coach itself is often suspended

by leather straps, thus preventing any vibration and shock to the baby.

The wheels should be fitted with rubber hubs, and when price is not the first consideration, with ball bearings. The latter make the running of the machine much easier and less lubrication is required. Thick wire-on tires should be chosen.

The bodies are now often made of pressed steel, the heading or other ornamentation being integral with the material, and not applied thereto as in the case of wood.



Perambulator. FIGS. 1 AND 2. Two models, both of which have deep, low-built, steel bodies, and wheels with ball bearings and rubber spokes and hubs. The car on the left is fitted with mudguards and a foot brake. Courtesy of Dunlop Safety Prams and of Lines Bros., Ltd.

perambulators. The surface is finished with nitro-cellulose enamel. These prams are easily cleaned, and the surface is not liable to chip. All the bright parts of the chassis can be protected from rust by chromium plating, which is standard on all good prams.

Instead of the ordinary waist strap, a patent safety strap is better; this costs only a trifle more and makes it impossible for the child to fall out of the pram. It is important that the hood and apron are efficient, fit well, and are stormproof. Extra fittings are mudguards to fit over the back wheels, a chain brake for attaching to the rim of the wheel when the car is left standing, and a holder for an umbrella. A brake should always be fitted, as it is unsafe to leave a pram standing without one. Even on almost level ground, baby can rock or shake the pram and so cause it to start in motion, and on an

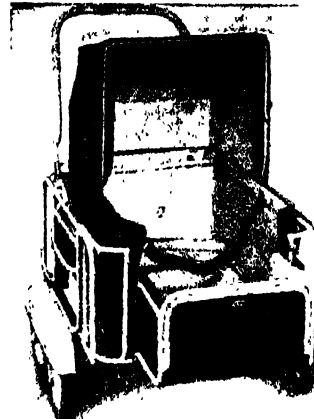
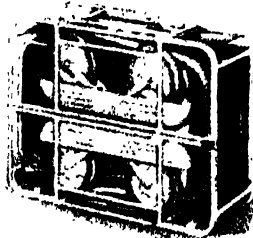
inclined surface it will start to move. The carriage should be dusted inside and out whenever necessary. Mud that has been allowed to dry should not be scraped off, as this damages and scratches the enamel, but should be washed off, using an old sponge or flannel then dried with a cloth. On no account dry a pram, hood, or apron in front of the fire; the rain should be wiped off with a cloth and the pram allowed to dry slowly as heat perishes rubber cloth and spoils painted surfaces.

with pliers and bending them until they are in line with the hole, then gently pressing the pin out through the hole in the axle. The D washer is drawn off and the wheel removed. Wheels with ball bearings may be dealt with in the same way as described for bicycle wheels.

In cases where the tire has been fitted with tire cement the rim of the wheel may be slightly warmed and the tire prized off with a strong screw-driver or tire lever. There are now two courses open, at least with many sizes of pram tire. Either a complete new tire can be purchased of the correct size, ready to be sprung on to the rim of the wheel, or a sufficient length of pram tubing with a cold wire embedded in the interior can be purchased. The former course is only suitable for small diameter wheels.

As a general rule this class of tire is fitted by warming the rim of the wheel, having a little tire cement in the bottom of the rim, immediately inserting the tire in place and springing it over the rim. In the case of the continuous tubing, the first step is to measure the length needed. This is done by coiling the tire round the rim and cutting it out about 1½ to 2 in. shorter than the length round the rim, the amount varying with the diameter of the wheel and that of the tire. The next step is to saw the tire asunder with a back saw, supporting the tubing in one side of the vice and manipulating the back saw with one hand while supporting the other end of the tubing with the other hand. Having cut it out, the ends of the wire are joined together by screwing one end into the other. To do this, it is necessary to twist up the length of tubing into three coils and place the two ends of the wire in register. On releasing the tire, it will uncoil itself, the ends will be firmly screwed into each other, and the tire will be found to be complete.

The next step is to spring the tire on to the wheel. This is best accomplished by gradually



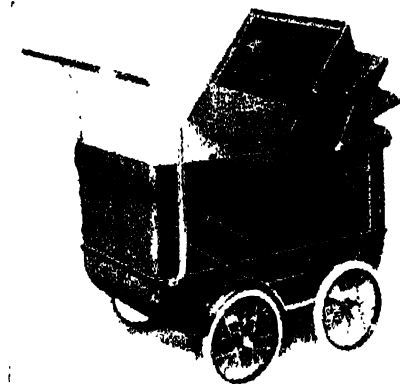
Perambulator. Fig. 3. Baby carriage with folding movement. Fig. 4. The Karipram folded to the size of a small suitcase measuring 26½" x 21½" x 11". Fig. 5. The Karipram, open.

Figs. 3, 4 and 5 show the Karipram in its folded and unfolded positions.

Beeswax dissolved in turpentine or any good wax polish can be applied to keep the pram in good condition. It produces a brilliant polish, feeds the wood and protects the steel put from rusting and the leather cloth from cracking.

The points that most usually call for attention are the tires, hubs, and hood. Pneumatic tires may be treated in the same way as cycle tires, when the ordinary solid tire breaks or wears it must be replaced by a new one. To do this, the first step is to remove the old tire. Sometimes tires are secured by cement, and in such cases will have to be warmed. For this purpose the wheel should be taken off from the pram, the dust cap on the end of the axle being first removed by means of a spanner; when it has been taken off it reveals the end of the axle.

In many prams the wheel is held on by a split pin and a washer known as a D washer; it has a flat part formed on it which engages on a flat on the axle, the purpose being to prevent the washer rotating. The split pin is removed by pulling the two ends together



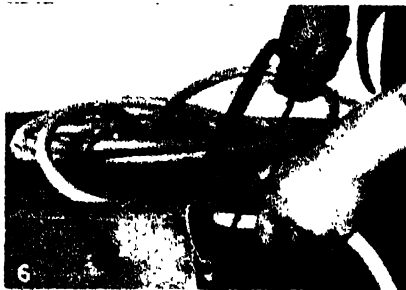
inclined the use of a brake is absolutely imperative if accidents are to be avoided.

The question of size is important in small houses and flats, and in the type of house where the hall consists of a narrow passage. The storage space must be considered, and the overall length and width should be measured, as in some models the handles extend 1 ft. to 1½ ft. beyond the carriage body. Folding handles can be had on some models, the levers being hinged so as to fold across the top or down against the body.

For two children a well-proportioned double carriage can be obtained. It is wider in the bed, a little longer, and has two hoods, and a special shaped apron to protect the occupants against rain.

Folding Baby Carriages. In some circumstances it may be difficult to house an ordinary pram, and one of the folding variety should be bought. Great care should be exercised in its selection, and the purchaser should not be induced to buy one of the ordinary low-built folding push cars. This type of car, though it may have an extension and provide a suitable bed length, has not the comfort necessary for a baby's first carriage, and serious curvature of the spine in an infant might result from its use in the upright position. For an older child the push car has its uses, as it is portable and can be taken away on holidays. It is used normally in the erect position, with the child sitting up, and can be arranged at will to allow the occupant to rest in a reclining posture. Examples of both types of car are illustrated.

Care and Repair. Perambulators wear well and last a long time if care is taken of them. The hubs should be oiled regularly, and the



Perambulator Repairs. Fig. 6. Replacing a solid tire: sawing off length of tubing with back-saw. Fig. 7. Tire twisted up in coil and wire ends joined. Fig. 8. Renewing worn-out rivets of a folding perambulator: a heavy hammer is held against the head of the rivet, and the riveting is done with a ball peen hammer.

working it on with the thumbs. The fingers and the hands should grasp the rim of the wheel and the tire firmly, so that it cannot possibly slip and spring off, while the thumbs are pressed over, gradually springing the tire into position on the rim. Before replacing the wheel the bearings are overhauled, hub and wheel cleaned up, and the axle cleaned and oiled with light machine oil. After this, the D washer, split pin and dust cap are replaced.

After the pram has been in service for some time it may well receive a thorough overhaul. It should be taken to pieces, commencing at the top and removing the hood, cushions, etc., and taking off the body from the chassis. The axles, if bolted to it, can be unfastened from the framework or springs and every part dismantled. The whole should be cleaned, and the metal parts wiped over with a rag saturated in paraffin oil, which will remove the bulk of the grease, then they may be finished off with a clean rag. Leather suspension straps can receive a dressing of harness oil.

All metal parts that have been painted should be well rubbed down with coarse sandpaper and smoothed off with fine sandpaper, taking care to remove all traces of rust. They may be painted with one or other of the special cycle enamels on the market which give an excellent result if the maker's instructions are carefully carried out. It is seldom worth while to repaint the bodywork. Many prams now have pressed steel bodies and are cellulose enamelled, a method giving a hard and durable surface. Scratched paintwork can be touched up with a paint of the appropriate colour.

The upholstery may be renovated with one of the leather revivers on the market. The axles and the underframe, or chassis, should then be put together, the wheels refixed, and the straps fixed in their positions. To refix the body will necessitate an assistant, one to hold up the body while the other fastens the straps to the hangers. The lining of the hood may require renewing, and to do this the old lining may be used as a pattern by which to prepare the new one.

Repairs to a Folding Perambulator

Folding cars call for somewhat different treatment, as their construction is not the same as that of the ordinary type of pram. The folding car is largely constructed of strips of metal joined by rivets. The wheels can be removed and re-tired in the same manner as already described. Sometimes the rivets wear and get slack, and the frame may not fold up properly. To remedy this, the rivet should be removed by filing off the shank where it has been buried over and carefully punching it out. Obtain a new one of requisite size, place it in position and rivet it up, holding a heavy hammer against the head and riveting with a light ball peen or riveting hammer.

The bodywork of this class of pram is constructed chiefly with waterproof material and suspended from wooden bars attached to the metal frame. To remove the body it is necessary to withdraw the nails and screws which secure it to these wooden bars. The front part of the body is secured by rivets to a cross-bar of metal forming part of the framework, and if this has to be removed the head will have to be filed off and the rivets punched out. When the body has been removed it can be renovated with leather reviver, or may be re-covered with new material, using the old as a pattern. If the upholstery is sound, but the padding solidified, remove the covering, tease the flock or padding and re-cover as before. When replacing the body, be sure it is securely fixed to the wooden bars and strongly riveted at the front.

The hood is removed by unfastening the screws which secure it to the wooden bars, as generally this type of hood is made up to give a kind of parallel motion arrangement, on

nickel-plated metal strips, which allows the hood to fall forward or backward as desired. When overhauling such a pram, the hood and body should be removed, all the joints well oiled and all traces of oil wiped off the exterior. The whole of the metal work should be cleaned down and re-enamelled.

PERCH: The Fish. Perch is in season from the end of May till the beginning of the following February. The fish, which varies in size from 1 lb. to 3 lb., should be cooked and eaten as soon as possible after being caught. It is difficult to scale, and sometimes the scaling is left till after it is cooked; but it is better to plunge the fish for a minute or two into boiling water and remove the scales before dressing it. The blanching will facilitate cleaning it.

Perch can be fried according to the general instructions given for frying fish.

To stew perch, prepare a large fish and stuff it with a rich veal stuffing, tying it together. Put into a stewpan 1½ pints good stock, add an onion and carrot prepared and cut small, also a bouquet garni. Lay the fish in the pan and pour over it a large wineglassful of port. Season it and stew it in the oven for 20 min. or longer, according to the size. Dish the fish, strain the liquor, reduce it till thick and add some matelotte sauce. See Fish, Matelotte.

PERCOLATOR. The apparatus known as a percolator is designed to enable liquid to pass slowly through a porous material, as in a coffee-pot or a filter. In the former, a perforated metal or china plate divides an upper compartment from a lower. In a filter, the separator is often made of porous earthenware through which water drips from the upper vessel to the lower and is purified in the process. See Coffee.

PERENNIAL. In gardening, a perennial is a plant which lives on from year to year (as distinct from annuals and biennials, and trees and shrubs). Ordinary herbaceous perennials are plants whose growth above ground dies down in late autumn or winter, fresh growth starting from the rootstock in spring. Familiar hardy herbaceous perennials include lupin, delphinium, and phlox. Some others are evergreen, e.g. the Christmas rose (*Helleborus*). Tender perennial plants include dahlias and bedding geraniums. Increase is by seed, cuttings, or division of clumps, according to the plant's requirements.

PERESKIA. A greenhouse succulent of perennial growth, pereskia is also known as the Barbados gooseberry. Two species are cultivated in Great Britain, *aculeata* and *blois*, and these are grown as stocks upon which to graft the epiphyllum or leaf-flowering cactus.

Perfume. See Scent.

PERGOLAS: IN WOOD AND BRICKWORK

The Construction of a Decorative Garden Feature

Gardening is represented by a great variety of articles. These, in addition to those on the flowers and plants, will be found under such headings as Arch; Rustic Work; Trellis. See also Flower Garden; Garden; Path; Rambler, etc.

A charming addition to any garden is a pergola. It is not only an admirable device for displaying the colours of flowering climbers, but is a means of providing a shady walk, as it is essentially intended for spanning a straight walk or path. In its simplest form the pergola is a skeleton structure, made up from prepared or rough timber, composed of uprights, spaced about 6 ft. to 8 ft. apart, connected together by longitudinal members, and cross-bars spanning the path. These should be at least 7 ft., and preferably 8 ft., in height, so that when they are covered with climbing plants there will be still sufficient room to walk beneath them.

Oak is one of the best materials, but any durable wood may be used. Larch and chestnut are suitable.

Some excellent effects are obtained by the use of rough hewn timber, especially oak, which may be worked somewhat on the lines indicated in Fig. 1. The bases of the posts should be charred or creosoted to preserve them from decay; they will last indefinitely if embedded in concrete. The posts may be about 4 in. square, connected together by horizontal members about 2 ft. 6 in. from the ground, and roughly mortised and tenoned and pegged together. The other longitudinal

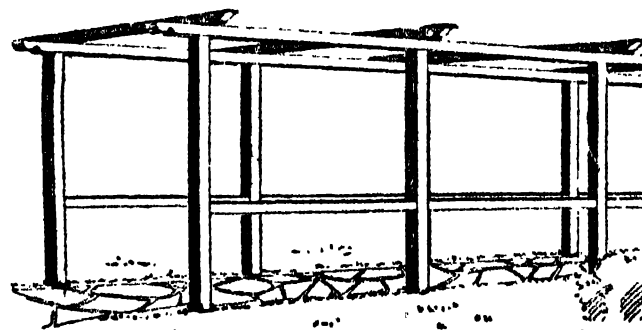
members are similarly mortised and tenoned and notched to receive the cross-pieces. They are further notched on their upper side to receive the lighter timbers, which are set on edge in the notches and laid longitudinally. Another method is to use rough poles, such as larch, and simply build up the structure by nailing suitable longitudinal and cross members to the uprights. This can be done with stout 4 in. wire nails.

A pergola nearly always spans one of the principal paths, the ground being marked out with lines, as in setting out the foundations of a building. Pegs are placed on every spot where an upright is to be fixed, and the lines removed. If the poles are of any size, the holes should be dug to a depth of about 2 ft., according to the nature of the soil, and the first post set up in position, plumb it to ensure its being upright. The earth is then filled in the hole around the butt of the post, and well rammed and consolidated. The butts could be concreted in if desired.

The next to erect is that on the opposite side of the path, adjacent to the first; that is, assuming that the pergola is to be straight, otherwise the procedure will be slightly varied. This is set up in a similar manner, and then the two posts at the opposite ends of the

pergola are similarly erected and plumbed. The height for the posts is then determined, a batten being tacked across them at the required height and tested for level, after which the tops are sawn off flush with the batten.

The other posts are erected in a similar manner, and as the first and last posts in the line have already been plumbed and levelled, all that is necessary is to stretch a line tightly



Pergola. FIG. 1. Good effect obtained by the use of rough-hewn oak, the uprights and rails being mortised and tenoned to each other.

between the two end posts, and adjust the remaining posts accordingly.)

Having fixed all the uprights, the next step is to fix the lower horizontal members, nailing these firmly to the uprights, as if this is done securely planks can be laid across them from side to side, to facilitate the fixing of the upper members, which may then be nailed in position. During the progress of the work the posts should be sighted from end to end by looking along them, to see if any of them are displaced when the error will be immediately perceived and corrected. Hence when the horizontal and longitudinal members are fixed, and the cross members nailed into position, there will be little fear of the pergola going out of shape.

Should the ground undulate, the top of the pergola may either be made level or can follow the curvature of the earth. In the former the post of the lowest point of the pergola should be the first to be erected. When a pergola is to be erected over a curving path, regular spacing is determined by the use of two batons, one the length of the space between the poles, and the other the width between them.

A permanent structure can be made with pillars of brickwork as in Fig. 2, and is often of architectural value to connect the house with some special feature of the garden. The brick pillars should be set up on a concrete foundation. Gaps should be left in the brickwork for the reception of the horizontal members, which are shipped into place, or built in while the brickwork proceeds. The work is completed by an open roof of timber, which may be stained to a dark colour.

After a pergola has been erected it is a very difficult matter to paint or colour it at any subsequent time, as all the climbers will have to be removed, and re-trained after the paint is dry. Consequently it is most economical to use a naturally durable material such as oak or brick, and to treat the less durable material with generous coats of wood preservative before attempting to train the plants around them.

PERIDOT. This deep yellowish-green stone is a species of olivine and is the month stone for September. It can be set in gold or dull silver, and harmonizes well with pink or white topaz, but needs diamonds to display its beauty to the best advantage.

PERILLA. The half-hardy annual perilla, which comes from China and has purplish ornamental foliage, is often used for summer



Pergola. Fig. 3. Charming arrangement at the entrance to a rose garden. The wooden uprights are connected by wires along which are trained single and double varieties of climbing roses.

bedding. It may be raised from seed sown in heat during March, the seedlings being transplanted and hardened off for planting out in June.

PERISTERIA. This stove evergreen orchid, *Peristeria elata*, is sometimes known as the dove flower; the fragrant blossoms, white marked with purple, appear in summer. It is best grown in well drained pots or teak baskets, and needs little water during the resting period. See Orchid.

PERITONITIS. Inflammation of the peritoneum, the serous membrane which lines the abdominal cavity and surrounds the greater parts of the contents, is called peritonitis. This lining membrane is liable to infection from perforating ulcers and abscesses of

the stomach and other abdominal organs; also infection may result through penetrating wounds, and other causes.

An acute attack generally begins with chilly sensations or violent shivering. The temperature rises quickly, and there is frequently an intense sickening pain in the abdomen. Any movement increases the pain, so that the patient is even afraid to talk, breathe, or cough, and lies on his back with the legs drawn up and likes to have the shoulders raised to relax the abdominal muscles. The pulse rises to 120 beats or more per minute. Vomiting sometimes begins early, and causes great agony. Great distension by gases occurs. Constipation comes on quickly.

To give the patient any chance of recovery an immediate operation is necessary. In the



Pergola. Fig. 2. Permanent structure made with pillars of brickwork and an open roof of timber, stained to a dark colour, over which roses, clematis, etc., will climb.

meantime to relieve pain, apply hot linseed meal poultices every 2 hours, covering them with cotton wool or flannels wrung out of hot water and frequently renewed.

PERIWINKLE: The Plant. This name is popularly given to the *Vinca*, a small family of hardy herbaceous perennial plants. They like a shady position and may be planted at



Periwinkle. Star-like blue flowers of the low-growing glossy-leaved shrub that loves the shade.

any time between autumn and spring. The flowers are blue or white, and propagation is by division of the roots in spring time. The common kinds are major, 20 in. high, and minor, 6 in. or so high. Both are suitable for planting beneath trees. There is a variety with green and white leaves. *Vinca rosea*, a tropical plant, is suitable only for cultivation under glass.

PERMANGANATE OF POTASH. This salt occurs in dark purple crystals, which give a deep violet-red colour to water in solution. Permanganate of potash is a very strong antiseptic, disinfectant, and deodorizer, removing offensive smells and killing harmful bacteria.

The best way to keep it is in solution in distilled water, dissolving 1 oz. in a pint of water. For use this must be further diluted as follows. As a gargle, 1 oz. of the strong solution to a pint of water. As a wash for ulcers and wounds, 2 or 2½ oz. to a pint of water.

Discoloration of the hands or linen caused by potassium permanganate may be removed by a solution of oxalic acid. It may be used as an application for insect bites and stings, and the crystals are rubbed into incisions made over snake bites. In offensive sweating of the feet a weak solution should be used as a foot bath once a day or oftener.

PERNETTYA. This beautiful low-growing hardy evergreen shrub, 12-30 in. high, is valued for the sake of its large, brightly coloured berries in autumn and early winter. The white flowers are borne in May. The species in cultivation is *Pernettya mucronata*, and there are many varieties with berries of various colours—crimson, rose, mauve and purple, as well as white. These shrubs like good soil, but will thrive in loam that is free from lime; they must be kept moist in dry weather. Propagation is by division in autumn or by cuttings and layers in July-August.

PERNICIOUS ANAEMIA. A very severe form of anaemia, which nearly always ends in death within 3 to 12 months, is termed

pernicious anaemia. The disease is most common in people of middle age, and appears to be associated with poisoning from septic stumps or other septic foci about the body. The pallor of the skin has a lemon-yellow tint. See Anaemia.

PEROWSKIA. This handsome shrubby hardy perennial is strongly scented with the perfume of the common sage. Its erect stems, bearing large terminal panicles of violet blue flowers upon silver-grey growth, are most attractive during September. There are four species, the chief being *P. atropurpurea*, 4 ft. high, which must be planted in a well-drained position where it can get full sunshine. It is best propagated by cuttings planted in light soil, under a handlight, during early summer.

PEROXIDE OF HYDROGEN. When diluted with an equal quantity of water peroxide of hydrogen may be used as a lotion for wounds and ulcers of all sorts. A teaspoonful made up to two table-spoonfuls with water makes a useful mouth wash or gargle for septic conditions in the mouth or throat, and the same may be used for cleansing the nose or ear.

Hydrogen peroxide is a good application for insect bites and stings. A teaspoonful added to the water used for cleansing the teeth not only helps to preserve their whiteness, but also prevents pyorrhoea. Teeth discoloured through smoking should be rubbed with a piece of cotton wool dipped in undiluted peroxide. It bleaches the hair to a yellow colour, and is frequently used for this purpose. In the case of dark-haired people bleaching will diminish the disfigurement of superfluous hairs on the face. In speaking of hydrogen peroxide the B.P. 10-volume solution is usually meant.

PERRIER WATER. The natural mineral water known as Perrier water is derived from a spring at the village of Vergèze, near Nîmes, in France. It contains a small quantity of sodium carbonates and is an excellent table water. See Mineral Water.

PERRON. This is a term applied to almost any type of external staircase leading to a house, but it is generally presumed that the entrance door is above ground level.

PERRY. Perry is the fermented juice of the pear, just as cider is the fermented juice of the apple; the difference between them is slight, but perry as a rule is lighter in colour. It does not taste strongly of the pear, on the contrary, a thoroughly fermented pear-juice made from a vintage pear may give a liquor that is indistinguishable from a good dry cider. The pear required for perry making is a hard astringent fruit, that good for eating being unsuitable for perry. When gathered, the fruit should be sufficiently mature and should not be stored for longer than a fortnight before use.

Perry is made in the same way as cider. It ferments better if a proportion, say 20 per cent, of bitter-sweet apples, or even crab apples, is included among the pears at the time of crushing. See Cider; Pear.

PERSIAN CARPET. Persian carpets and rugs normally have cotton warps and wefts. In some classes the design, made of dyed or undyed yarns, is always fastened to the warp with Sehna or Persian knot, in which the yarn is passed under the first warp thread and over it and under the next before reappearing between them. The Ghiordes or Turkish knot, found in all Anatolians and Caucasians, whose warps and wefts are wool, as well as in some Persians and Turcomans, lays the yarn over two warp threads, passes it under both, and then brings both ends through between them. The pile or nap is afterwards produced by severing the loops of the knots.

The Sehna knot may be right-handed or left-handed, so that the nap points either to the

right or to the left top corner. With the symmetrical Ghiordes knot the nap always runs in a forward direction. The lustrous sheen possessed by all Persian carpets and rugs is due to the wool being washed in soft running water, leaving the natural grease unaffected. Their durability is aided by their harmless vegetable dyes. Silk is seldom used, except in some uncommon classes, notably the Kashans, not to speak of the modern commercial reproductions done in inferior dyes at Kaisariyeh. Undyed camel hair sometimes appears in field or border in Hamadan rugs, but a good deal of so-called camel is goat. The gravest defect in modern fabrics is the substitution of the old vegetable dyes by aniline products, which perish the yarns and cannot be mellowed. It is now the custom in the carpet trade to describe most Oriental carpets as Persian no matter from whence they come.

Tabriz rugs almost always have florid medallion centres filling the whole field. This style they share with Kirmans, whose dyes are always good, but Kirman designs made at Tabriz to dealer's orders are not always guiltless of aniline. Medallions, with or without corner-pieces, also characterize the Ghorcan fabrics, which are almost always in carpet sizes only. Four-medallions, which run in a series with the axes projecting, are a great feature of the Hamadan and Shiraz looms. Birds and animals, diagonal stripes, and other motives are also common Shiraz styles.

Very attractive is a diaper pattern of small repeated objects, carried out in restrained and yet gleaming tones. This is much favoured for small rooms, because it does not dwarf their dimensions, and harmonizes with neutral furnishings and wall-hangings. Of these the most famous are the Eraghans, which are highly esteemed in the East when made with the Herat design, a rosette between two lance-shaped fish-like leaves. The field may be dark blue or rose-red and ivory, with ivory and greenish border tones; if there is much yellow, and the Ghiordes knot is present, it should be noted that the piece cannot possibly be antique. Saraband is usually diapered with the pear or cone design, arranged with the stems in opposite directions; in the style of Khorasan and Herat the pears all face the same way. The most charming of Sarabands have borders of small conventionalized flowers linked up by a trailing vine, notably rich rose or blue pieces with ivory borders.

Some classes have fields of large floral designs without any medallion suggestion, especially in the extensive output of the Sultanabad district. From here come showy carpets with florid borders of a type much affected for Axminster squares. The mechanical symmetry of these reproductions lacks the appeal of the unspoiled native craftsmanship. Other better Persian designs are copied freely in the British factories, and such carpets, whether Wilton or Axminster, are a good choice for dining room or living-room. See Carpet; Dining Room; Rug.

Persian Cat. See Cat.

PERSIAN CYCLAMEN. This is the popular name for *Cyclamen persicum*, an attractive winter- and spring-flowering plant for the amateur greenhouse. Some varieties of this cyclamen have prettily fringed petals, whilst others bear quaint butterfly-like flowers. See Cyclamen.

PERSIAN LAMB. A fur, often confused with astrakhan, which it somewhat resembles. Persian lamb is a curly black skin of remarkable softness and durability. Rain does not affect it, and therefore, unlike most furs, it may be worn with safety in wet weather. Its natural colour is a rusty black, but it is dyed to a much deeper shade.

PERSIAN LILAC. This is the popular name of *Syringa persica*, a graceful hardy shrub. It grows to a height of 4 ft., and bears lilac-coloured fragrant blooms in May.

PERSIMMON. Of the several kinds of persimmon the best known is *Diospyros kaki*. This is a small leaf-losing tree which, if grown in large pots in a sunny, airy greenhouse, will yield its orange-yellow, plum-like fruits. In mild districts it may be grown on a sunny wall out of doors.

PERSPIRATION. The sweat glands, the essential purpose of which is to extract water from the blood and pour it out on the surface of the skin, are scattered all over the body. They are especially numerous on the soles of the feet and the palms of the hands. Perspiration, although we are sensible of it, is continually flowing. The average amount of perspiration, sensible and insensible, in the 24 hours is about 2 lb., but exercise or heat increases the amount to an enormous extent.

The chief function of perspiration is to regulate the heat of the body. People who do not sweat easily are very liable to heat stroke if they had themselves under conditions which provoke this. Perspiration, therefore, fulfils an exceedingly important function, and care should be taken, by keeping the skin clean, to give it free exit.

Excessive perspiration chiefly affects the armpits, groin, and feet, and is sometimes associated with an offensive odour. The parts should be washed once a day at least with cold water and soap, dried thoroughly, and powdered freely with boric acid. In the case of the feet the powder should go well in between the toes, and the inside of the socks should also be powdered. Shoes should be worn for the sake of coolness. The following powder could be used instead: Salicylic acid 15 gr., powder starch 50 gr., powdered talc to 1 oz. For the armpits the following powder may be dusted on several times a day after washing the parts and drying them thoroughly:

Oil of rose geranium	6 minims
Salicylic acid	1 dram
Zinc stearate powder	3 oz.
Powdered starch	8 "

For the feet these lotions are useful, applied daily: 1 oz. formalin in 2 pints water, or water coloured red with permanganate of potash, or a 2 per cent. ointment of salicylic acid in vaseline may be used. Those who perspire freely should always wear woollen underclothing.

Perspiration stains on clothes should be treated promptly with fresh lemon juice and then washed in warm soapy water. If this treatment is not successful at first it may be repeated, but the lemon juice should not be allowed to remain on for more than a few minutes, otherwise it may itself injure the colour of the material.

PERUVIAN BALSAM. Known sometimes as balsam of Peru, this is the exudation from the trunk of a Central American tree. Externally, it acts as a disinfectant and as a stimulant when applied to a raw surface. Its chief use externally is as a parasiticide in the treatment of scabies, nits in the hair, etc. It exerts a stimulant and antiseptic action on the lining of the bronchial tubes, and is therefore often included in expectorant mixtures in the treatment of chronic bronchitis.

When poured upon a fresh wound and covered with a bandage, Peruvian balsam has a healing and antiseptic action, and the balsam need not be changed for many days.

PERUVIAN LILY. This is the popular name of *Alstroemeria*, hardy tuberous-rooted plants which grow from one to three feet high and bear showy, amaryllis-like flowers in summer. In some gardens, especially those having well-drained soil, they give no trouble, and in fact sometimes become rather a nuisance by spreading rapidly. In others



Peruvian Lily. Bulbous plant of vivid hue well suited for growing in a sunny border or rockery.
Courtesy of Amateur Gardening

where the soil is clayey it must be made suitable by adding leaf-mould and sand very freely. The Peruvian lilies need a sunny place and appreciate such shelter as is provided by a wall or fence. The roots should be planted 5 in. or 6 in. deep in spring. Some of the best kinds are aurantiaca, orange flushed with red, chilensis and its varieties in many rich colours, and the lighter shades of pink and orange. Propagation is effected by lifting and dividing the roots in spring or by sowing seeds under glass in early spring.

PETASITES. The winter heliotrop (*petasites fragrans*) is useful for planting in the wild garden or woodland for the sake of its white fragrant flowers, which open in February, when few other plants are in bloom. It grows 12 in. or so high and spreads so rapidly as to become a nuisance in small gardens.

Peter's Pence. In certain localities this name is given to the honesty (q.v.).

PETROL. This is the name given to a system of lubrication in internal combustion engines in which the lubricating oil is mixed with the petrol in the main tank of the machine. See Internal Combustion Engine; Lubrication.

PETROL, or Gasoline. These names are used for the lighter distillates obtained from crude oil. Petrol is highly inflammable, and its vapour, when mixed with air, is explosive. Regulations require that petrol for use in motor vehicles shall be kept in metal containers. The maximum amount of petrol that can legally be kept in one storage place is 60 gallons (including the amount in the tank of any motor vehicle).

Petrol must not be kept in vessels of over 2 gallons' capacity (other than the tank of a motor vehicle), unless the storage place is more than 20 ft. from any building or public footpath, and notice is given to the local authority. If the storage place is within 20 ft. of any building, stack of timber, or other inflammable substance, no petrol may be kept except in the tank of the vehicle.

Petrol must not be used near fire or a naked light, nor in any storage place except as fuel for a motor vehicle, or in quantities not over one gill for cleaning or repairing. Petrol should never be poured down a drain. The filling up of the petrol tank should never be done in the

presence of a naked light. An electric light or some form of safety lamp only should be used. One or two pails full of sand should be kept handy in case of fire, or a better plan would be to install one of the chemical fire extinguishers. Small petrol fires can usually be smothered with a damp cloth or sacking.

Water should not be used if petrol takes fire, as the petrol will float on top and thus be distributed over the floor of the building.

A point to remember is that insurance companies will not accept liability should it be proved that even as little as one tin of petrol is kept on the premises in which the car is garaged, unless the amount and method of storage are stated at the time the policy is effected. This does not apply to petrol in the tank of the car or motor cycle.

Cleaning Uses. As a cleaning agent for clothes, petrol has few equals. Serge, silk, satin, felt, and velours garments of all kinds, provided that they are not of too light a colour, can be cleaned with it.

Petrol is particularly useful for cleaning suede shoes, bags, and gloves. These should be brushed free of dust, and then rubbed vigorously with a flannel soaked in petrol, special attention being paid to any stained parts, the article then being dried in the open air. The soft surface of the suede can be restored with a wire brush. Satin dance shoes that are soiled can be treated with petrol.

It should be noted that petrol vapour can travel a considerable distance and be ignited by a fire or lamp. Many fatalities have been caused thus.

Cleaning with petrol is best done in daylight, out of doors, and the petrol must be kept at a safe distance from a fire or naked light. See Dry Cleaning.

Petroleum See Paraffin.

PETUNIA. This half hardy flowering plant is suitable for cultivation in the greenhouse and for planting in flower beds out of doors in summer. Though they are perennials and can be increased by cuttings under glass in spring, if it is wished to perpetuate named or special varieties, it is usual nowadays to treat them as half-hardy annuals and raise them every year from seeds sown in a heated glasshouse in February. Those which bear



Petunia. Favourite greenhouse plant bearing flowers ranging from pink to crimson and purple

double flowers must be propagated by cuttings—these are more suitable for cultivation in pots under glass than out of doors. A compost of loam, leaf-mould, decayed manure and sand will ensure fine plants.

PEWTER: The Metal. A silvery grey metal, very soft and ductile, pewter is composed of a similar group of metals to those known as Britannia metals, or alloys which contain a large amount of tin. Pewter is used in the form of sheet, and can be cast in a ladle or in a simple furnace. In some typical compositions of pewter the percentages of the metals are as follows:

Tin	Antimony	Copper	Zinc	Lead
91.5	6	1	—	1.5
88.5	2	2.5	3.5	1.5

If bismuth is added to the extent of 5 per cent the melting point of the alloy is lowered. Copper and antimony both tend to harden the alloy. With lead there is the danger of lead poisoning. Pewter melts at about 400° F., a temperature only one third of that necessary to melt aluminium or brass; it can, therefore, be fused in a ladle over a gas ring or fire. Articles to be made in pewter in the form of cuttings are first modelled or a pattern made, and the mould is prepared with moulding sand or plaster of Paris. The latter must be well dried before the metal is poured. The casting

is finished by polishing in the lathe.

Suitable solders for pewter are composed as follows: 1 part each of bismuth and tin, melts at 286° F.; 3 parts tin, 1 part lead, melts at 334° F.; 1 part bismuth, 2 parts tin, melts at 336° F.; 1 part bismuth, 3 parts tin melts at 392° F. A commonly used solder alloy consists of 1 part of bismuth, 1 part of tin, and 2 parts of lead. The larger amount of lead may be safely used on outside work. Of the fluxes for pewter work Gallipoli oil, tallow, resin, and chloride of zinc are the most used. The oil is to be preferred, and can generally be purchased from first-class supply shops. This is simply applied to the work and the solder run on in the usual way.

To get a bright finish on pewter the piece should be first cleaned with benzoline to remove any finger-marks and then rubbed all over, both the worked and unworked parts, with ordinary knife-powder until the necessary polish has been given. If after cleaning as described the owner desires what is known as a satin finish to his pewter, he should obtain some very fine powder, such as is used by dentists, and use it on a flannel to polish the piece. The flannel should be rubbed round not up and down.

PEWTER COLLECTING. The great charm of pewter is the pearly grey colour, and there is no other exactly like it. The beginner will do well to study the collection in a good museum, and make up his mind to specialize in one branch of pewter, not necessarily to the

exclusion of any other in the case of a good specimen presenting itself.

Medieval and Elizabethan pewter is rare. Jacobean is scarce and costly. Georgian is rather decadent in form and in taste. Bavarian and Flemish pewter of the 18th century was often beautifully designed, but most foreign examples, except some French ware, are apt to be poor in the composition of the alloy, i.e. there is too much lead. Victorian pewter beer-mugs are found in collections side by side with possibly a set of recent French or Belgian measures of the metric system, very plain, and with very ugly lids.

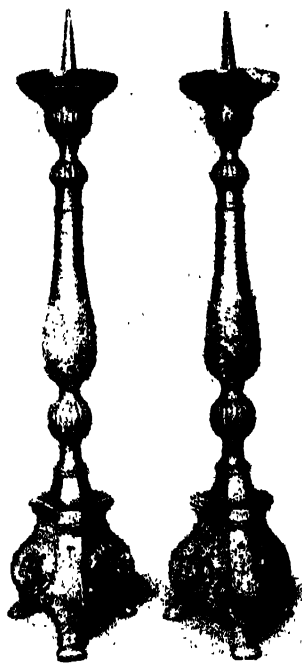
Irish and Scottish pewter is almost invariably good, and some of the finest pewter in the world is probably Scottish ecclesiastical ware. Salt cellars, candlesticks or candle-boxes may appeal to some, inkstands and snuff boxes to others; spoons, again, a fascinating subject with a very special literature of its own, may

attract others. Plates of good quality by a well-known maker are worth picking up if reasonable in price. Dishes fetch far more, and a bear's head dish 24 in. in diameter is worth many pounds. Jugs are effective pieces for display, and so are chocolate and coffee pots. Some collectors may feel drawn to the collecting of church plate. References to pewter flagons and patens may be found in the county books dealing with church plate; but there is much faked church plate in the market. Jacobean flagons are dignified and of sterling quality as a rule. Georgian church plate is heavy and rather dull. Church plate is sometimes made of Britannia metal which the collector must avoid.

A small collection of pewter may be displayed to advantage on a Welsh dresser or an antique style oak sideboard or buffet. The plates will look well placed on edge, and the table portion will serve for a few choice exhibits, such as tappt-hens (see Fig. 3) or large tankards. A few small cups may be permitted on the shelves in front of the plates. The drawers in the dresser, or the cupboards at the sides, may be used for small exhibits, such as spoons,

For those who specialize in small articles such as snuff-boxes or spoons, the only satisfactory method of display is in a curio table with a glazed top.

It is no use to put pewter with brass tobacco-boxes, steel candle-snuffers, china and Sheffield plate, all mixed up together. Pewter also suffers from being placed in a room where decoration and furniture are of too ornate a description to make a good setting. It looks best with oak or plain mahogany furniture and in the rather old-world type of living-room, dining room or hall. To realize the effect of pewter properly displayed, a visit to the Victoria and Albert Museum may be recommended. If any specimens of pewter are imperfect through age, accident, or carelessness, they may

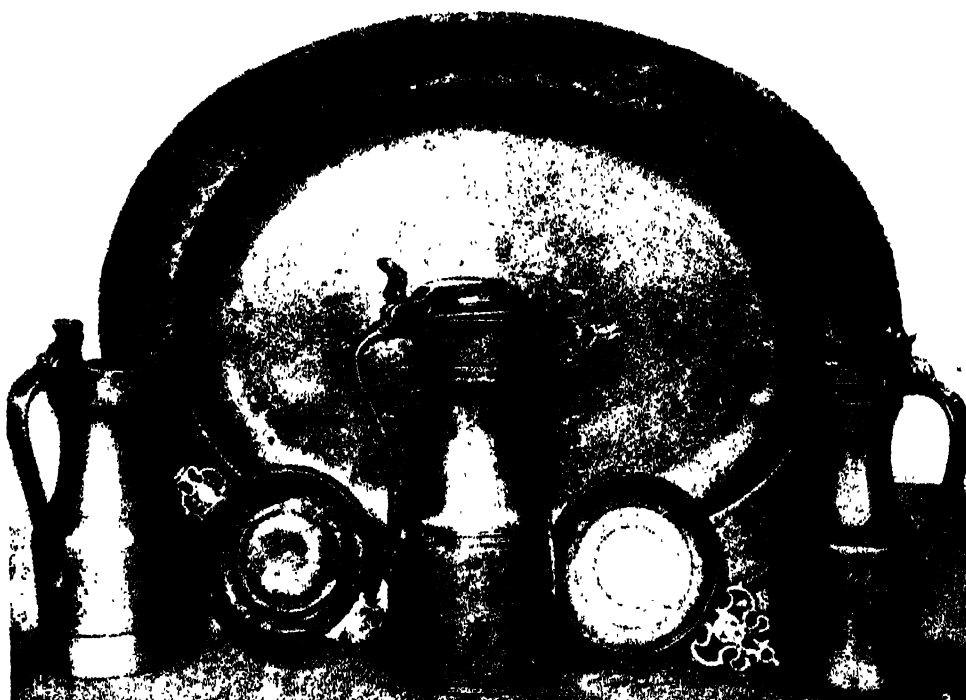


Pewter. Fig. 2. Pair of Flemish candlesticks, 36 in. high, c. 1740



Pewter. Fig. 1. Bavian spoon pot, dating from 1740-50

first modelled or a pattern made, and the mould is prepared with moulding sand or plaster of Paris. The latter must be well dried before the metal is poured. The casting



Pewter for the Collector. Fig. 3. Left to right: French lidded measure, c. 1690-1710; English porringer of Charles II period; Scottish tappt hen, 1750; English bleeding bowl, Stuart period; French lidded measure of about 1715. At the back is an English dish, 1780-90

Courtesy of H. A. A. Kimbell

be displayed in a cabinet just as specimens, or they may be restored by a careful restorer, to render them capable of the ordinary handling to which they may be subjected.

It is possible to lacquer the pewter, when it has once been properly cleaned, with an acetone varnish, which is transparent and not offensive in appearance. It is, however, far more satisfactory to clean the pewter to a certain point of brightness, not too silverlike, then smear it over with a rag which has some vaseline upon it. Rub it well with a clean, soft velvet cloth, and afterwards at intervals, as the Japanese are said to do to their wonderful metal work, polish with an old silk handkerchief.

PHACELIA. The most beautiful flowering plant in this group or genus is *Phacelia campanularia*. This annual should be sown out of



Phacelia. Bell-shaped flowers of the species known as *campanularia* of this American annual.

doors in April where the plants are to bloom in summer; it grows 9 or 10 in. high and bears bell-shaped flowers of rich blue colouring. It thrives best in a sunny place and in well-drained soil.

PHAIUS. This is a very old type of terrestrial orchid requiring cultivation in a stove-house, and it is, therefore, beyond the scope of most amateurs. There are several species in cultivation, all of which grow some 2 ft. in height, and bear blossoms of various colours. See *Orchid*.

PHALAENOPSIS. This is a most graceful plant with flowers on long arching stems. It is grown in baskets or suspended pots in a warm greenhouse in a compost consisting of sphagnum moss and a little orchid fibre. A minimum winter temperature of about 60 degrees is necessary. They need moist, shady conditions in summer and a good deal of water while growing freely, but drier conditions in winter. The flowers are white marked with various shades of colour. *Schilleriana* and *sanderiana* are two well known ones, but the newer hybrids are now chiefly grown.

PHARYNGITIS. Inflammation of the pharynx, the cavity behind the nose and mouth, is of three main varieties: acute simple pharyngitis, commonly called sore throat; chronic pharyngitis, frequently occurring in singers, speakers, street hawkers, and others who overtax their vocal organs; and acute phlegmonous, a serious but rare affection.

In acute simple pharyngitis, or sore throat, the inflammation is superficial. The common cause is exposure and catching cold. The patient has a feeling of tenderness, dryness, and tickling in the throat. He sneezes, coughs, has a headache, and loses his appetite.

Usually the inflammation lasts only a few days or a week. The patient should remain in bed if he desires a speedy cure. To relieve the congestion and discomfort in the throat,

give ice to suck, and apply a flannel wrung out of hot water to the throat. Inhalations of steam give relief. A good application to the throat is glycerin of borax. When the inflammation has subsided the patient should use a gargle of a $\frac{1}{2}$ teaspoonful either of glycerin of tannic acid or of alum, in a wine-glass of water, or the glycerin may be painted on. He should keep to a liquid diet.

Chronic pharyngitis, or clergyman's sore throat, is caused most frequently by over-use of the voice. The patient should give his voice a long rest, and go to live in a warm, dry climate if possible. He must give up smoking and drinking alcohol if these habits are practised. The pharynx may be sprayed with a 1 per cent solution of carbolic acid once or twice a day. An excellent gargle is made of 1 dram each of common salt, bicarbonate of soda, and borax in a pint of tepid water. See *Throat*. Pron. Far-maj-ritus.

PHEASANT. Pheasants are in season from Oct. 1 to Feb. 12 and should be hung for 12 to 15 days. Pheasants may be tested for age by examining the wing feathers and the spurs in the cock bird. The spurs in an old bird are long and sharp; in a young bird they are short or round and blunt.

In preparing a pheasant for cooking it is trussed like a chicken and stuffed and roasted as described under the heading *Game*. A medium-sized bird takes 30-35 min. to roast, but the time varies according to the size of the bird and the heat of the oven.

Pheasant and Macaroni. Roast pheasant trussed and served with macaroni makes a change from the ordinary method of dressing. Only young pheasants are suitable for this dish. Lard closely the breasts of a brace of pheasants with small strips of larding bacon, using about 6 oz.; cover with thickly greased paper, and roast for 25 min. in a moderate oven. Then remove the paper and return the birds to the fire or oven for 10 min. longer.

While the birds are cooking, prepare the macaroni. Cook 1 lb. small macaroni till tender, in plenty of boiling salted water; strain it, and return it to the stewpan with 2 oz. butter or margarine, 1 teaspoonful tomato sauce, and the same of brown gravy. Mix well, and let all become very hot, then season with white pepper and add 3 oz. grated cheese. Do not stir to mix them, but toss them over and over with a fork. Arrange the macaroni on a dish, sprinkle over a little more cheese, and pour over another teaspoonful of gravy, then serve the pheasant on the top of the macaroni.

A Pheasant Entrée. An excellent method of cooking pheasant as an entrée is called the gipsy way. Truss the bird as for boiling, and put it into a stewpan or cocotte with 6 oz. diced bacon. Add 2 oz. butter or margarine, and a tooth of garlic, and fry until the bird is brown. It should be turned over while frying, so that the breast becomes as well coloured as the back. Now pour away the surplus fat, and add 2 peeled and sliced Spanish onions, 4 peeled and sliced large tomatoes, and 2 wine-glasses sherry. Season to taste. Put the lid on the stewpan, see that it fits well, and stew gently for $\frac{1}{2}$ hour, giving the pan every now and then a gentle shake. When cooked add a dust of pimento pepper, and dish up with



Pheasant. Roast pheasant, garnished with tail feathers and served on a bed of watercress.

the gravy and vegetables poured round it on the dish. The remains of cold pheasant may be used up in any of the methods described under the general heading of *Game* in this work. See *Casserole*; *Chicken*; *Fowl*; *Game*; *Partridge*.

PHEASANT'S EYE. This is the popular name of *Adonis*, a genus of spring-flowering hardy herbaceous perennials suitable for the rock garden. The best known is *Adonis amurensis*, which grows 12 in. high, has deeply cut, almost fern-like leaves, and large yellow buttercup-like flowers in March-April. *Vernalis*, 9 in., bears smaller yellow flowers in spring. Loamy soil with which leaf-mould has been mixed suits these plants. The annual kinds, autumnalis, bright red flowers in late summer, and aestivialis, red flowers in June-July, are raised from seeds sown out of doors in April in a sunny place in light soil.

PHLEBITIS. Inflammation of a vein or phlebitis, may be of a septic or a simple character. Septic phlebitis may be caused by organisms circulating in the blood, or by such organisms being introduced through a wound or making their way into the vein from septic tissues which surround it. It is a very dangerous condition, as clotting, or thrombosis, occurs in the vein, and the clot becomes infected.

Simple phlebitis is more prone to occur in the gouty and in those who are anæmic. It is more likely also to occur in veins that have been in a varicose condition for a long time, or in veins in which the circulation has been sluggish for a long time.

The occurrence of phlebitis is marked by pain and tenderness in the line of the affected vein, which is felt to be firm and cord-like. If the vein is superficial the skin over it is reddened and somewhat swollen. If a large deep vein of a limb is involved, the limb below the site of the mischief becomes progressively swollen and brawny to the touch.

A person suffering from phlebitis should rest in bed, and if the affection is in one of the veins of a lower limb, as it most commonly is, the limb should be swathed in cotton wool and elevated on a pillow. Pain may be relieved by smearing glycerin of belladonna along the line of tenderness. The weight of the bedclothes should be taken off the limb by using a bed-riggle. Large doses of sodium or potassium citrate are sometimes given in order to lessen the risk of thrombosis. See *Varicose Veins*.

PHENACETIN. Phenacetin is a colourless, tasteless, crystalline substance which is only slightly soluble in water. Its chief use in medicine is in the relief of pain. In the treatment of severe neuralgic headache, migraine, dysmenorrhœa, the lightning pains of locomotor ataxia, phenacetin in 5 gr. doses every hour until 3 or 4 doses have been taken often gives great relief. Further, to safeguard against the possibility of heart depression following on the drug's action, phenacetin is often prescribed with caffeine, as in the following powder: caffeine citrate 2 gr., phenacetin 5 gr.

In poisoning by an overdose of phenacetin an irregular, fluttering pulse, slow breathing, blueness about the face, profuse perspiration, and a general condition of collapse, which may even lead to death, are the commonest symptoms. Treatment consists in applying warmth to the body by hot water bottles, warm blankets, etc., and in administration of some stimulant, spirits or sal volatile. The patient should remain in bed for a day or two after the symptoms of poisoning have passed off, to avoid all risk of heart failure.

Philately. See *Stamp Collecting*.

PHILODENDRON. The hothouse plant called philodendron has heart-shaped or arrow-shaped leaves, usually of a very vivid green

in colour. The plants require a mean average temperature of 60° in pots in a mixture in which leaf-mould and peat predominate. They are useful for training up pillars and covering ugly walls, but their flowering properties are negligible. Propagation is by cuttings at any season of the year. Water should be given freely daily.

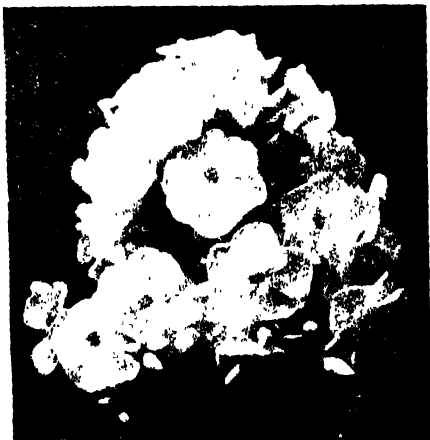
PHLOMIS. This is a shrubby or partly shrubby plant of sage-like appearance which does best in sunny places if set in well-drained soil. The most handsome of all is the Jerusalem sage (*Phlomis frutescens*), a shrub 4 to 5 ft. high with grey leaves and bearing yellow flowers in summer. It is increased by cuttings placed in sandy soil in a frame in July and August.

PHLOX. The herbaceous perennial phloxes are invaluable border plants which are in full beauty in July and August. They flourish remarkably in the cooler northern districts, and in southern gardens are best suited by being planted in slight shade. They must have deeply dug soil enriched by manure; they are not a success in poor, dry ground. If the plants are allowed to remain undisturbed for 2 or 3 years they form splendid clumps.

Propagation is by division in early autumn or by taking cuttings of the young shoots in spring and setting them in sandy soil in a slightly heated greenhouse. The best beds of phlox are obtained by lifting a few plants in autumn, planting them in boxes in a slightly heated glasshouse, and inserting the fresh shoots as cuttings early in spring. If put out in April-May each plant will bear one splendid head of bloom.

Many new varieties of phlox are introduced almost every year, and for them the nurserymen's catalogues should be consulted. A few beautiful ones are *Le Mahdi*, *Europa*, *Rijnstroom*, *F. A. Baumer*, and *Earl Campbell*. The beautiful double anemone phlox, *Dromandery*, of which there are varieties bearing flowers of various colours, is an excellent summer bedding plant, for it blooms for many weeks. It is raised from seeds sown in a heated glasshouse in February-March; the seedlings being planted out of doors in May.

The dwarf trailing phloxes suitable for the rock garden are charming plants which soon spread into wide masses if planted in slight shade in a compost of loam, leaf-mould and sand. They are increased by cuttings inserted in sandy soil beneath a handlight as soon as the plants have finished flowering. The favourite is the moss pink (*Phlox subulata*), of which there are several beautiful named varieties, e.g. *G. F. Wilson* (mauve), the *Brick*, white, and *Vivid*, rose. *Phlox amona* bears large rose-coloured flowers. All these dwarf phloxes bloom in spring.



Phlox. Flowers of the herbaceous phlox, a splendid border plant which blooms in July-August.

PHOENIX. Of this palm, which is not hardy in Great Britain, the chief species is the date palm (*Phoenix dactylifera*). It is less decorative as a pot or tub plant when grown under glass in this country than *Phoenix canariensis*, a tall graceful palm for large conservatories. *Phoenix rupicola* is another attractive kind and *Roebelia*, a less vigorous palm, is particularly useful. These palms thrive in a compost of half loam and half peat with sand added freely. They need moist shady conditions and a minimum winter temperature of 50-55 degrees. Propagation is by means of seeds sown in pots of soil plunged in fibre in a case in the hot house.

Phormium. See New Zealand Flax.

PHOSPHATE: In Medicine. The salts formed by the union of phosphoric acid and bases are called phosphates. They are used in medicine as tonic remedies, in the syrup of iron phosphate, the compound syrup of iron phosphates, B.P.C., or chemical food, Easton's syrup, and similar preparations. Sodium phosphate and effervescent sodium phosphate are used as aperients.

PHOSPHATE: In Gardening. The fertilizers known as phosphates are essential in the garden for the well being of plants, as their action directly affects fruiting and flowering. These phosphates consist of various proportions of phosphoric acid combined with bases of organic mineral substances such as potash and lime.

One of the most valuable combinations is superphosphate of lime, which, in good commercial samples, contains about 25 per cent of soluble phosphates. This phosphatic manure is best applied during spring, lightly forking it in 2 or 3 weeks before sowing or planting. It is most suitable for land with tendency towards lightness. On heavy, clayey soil another phosphoric manure, basic slag is to be preferred.

Bones are valuable for the phosphates they contain, and are comminuted in a substance

known as steamed bone flour, which is a great acquisition wherever phosphatic food is required. Other phosphatic manures are phosphate of ammonia and phosphate of potash, both particularly valuable as liquid stimulant for pot plants, and used in the proportion of $\frac{1}{2}$ oz. to a gallon of water. See Fertilizer, Gardening; Manure.

PHOSPHORUS. Ordinary phosphorus is a peculiar waxy solid substance which, when exposed to the air, rapidly oxidizes and readily bursts into flame. It therefore must be kept under water, in which fluid it is insoluble. Phosphorus has the characteristic of glowing in the dark. There are several kinds: the white or yellow is violently poisonous, but the red or amorphous is not poisonous. Poisonous phosphorus is no longer used for matches, but is present in some rat poison.

Poisoning by Phosphorus. One of the first symptoms of acute phosphorus poisoning is a burning sensation, or a taste something resembling that of garlic, in the mouth. Then a burning pain may be felt in the throat and stomach. The patient vomits, and if the matter brought up is examined in the dark it may be seen to glow. Purging occurs in some cases.

The doctor must be sent for without delay. Meanwhile, give a very weak solution of permanganate of potassium or oil of turpentine, the French variety for choice. It may be given in doses of thirty minims every half hour. The patient should be given soothing drinks, such as barley water, brewed tea, and gum water. He must not be given castor oil, or any other oil, butter, fat, milk, or eggs, for three or four days.

PHOTINIA. Of this genus of shrubs the most valuable in gardens in this country is the Chinese hawthorn, *photinia serrulata*, an evergreen which will reach a height of 10 feet or more. It bears white flowers in June and the reddish tinted young leaves are attractive. This shrub is not very hardy and except in mild districts should be planted against a sunny wall.

PHOTOGRAPHY: HOW TO GET GOOD RESULTS

Hints and Suggestions for Snapshots and Advanced Work

For advice about the camera and the different photographic processes, the reader is referred to the special headings: Camera; Developing; Focusing; Fixing; Negatives; Printing; Washing, etc. See also Landscape Photography; Lens; Pachrometric.

Amateur photographers may roughly be divided into two classes: those who regard consciously or unconsciously the camera as a machine in which all that has to be done is to press the button, while the camera and the chemist do the rest; and those who regard photography as a hobby without limit in interest and knowledge.

For those in the class first mentioned the principal considerations are the methods of obtaining the results they want with a minimum of trouble, and the complete exclusion of the chemical side of photography. So limited, photography can nevertheless be made an interesting and valuable hobby if the limitations are frankly accepted, and a few rules studied and intelligently applied. Photography of this kind is generally spoken of as snapshot photography.

Photographers of the second type develop out of the first, because they find that the best way of learning how to improve their results is to make some study of each branch of photographic work, and, in particular, to develop their own negatives and to make their own prints and enlargements. Each of the separate operations is dealt with in detail in other parts of this Encyclopedia. Here will be given an outline of the subject in two sections, one for the taker of snapshots and the other for the amateur with wider aims.

For the beginner the simplest, and in many ways the most satisfactory, type of camera

is the box form or other type of fixed focus roll-film camera, provided he accepts its limitation, and does not expect a camera which is designed for snapshots in strong outdoor light to produce indoor portraits.

It is still a common delusion that a really good photograph can only be obtained by the use of a first-class camera with a very expensive lens. It is far more probable that the beginner will produce good photographs with the simple box form camera than with a more elaborate camera possessing an expensive lens. It is simply a question of knowing what the camera and its lens can do.

The Camera. Two things which the beginner should bear in mind from the first time he uses his camera are, first, that it is not a press-the-button machine, but a tool which requires practice for its proper use; second, that as it is a snapshot camera to be held in the hand, successful snapshots can only be obtained in strong light out of doors. Although the simplest box camera can be used on a stand or steadied on a wall or a chair while a time exposure is given, which means an exposure lasting longer than $\frac{1}{5}$ to $\frac{1}{10}$ sec., the beginner will generally wish to snap everything.

Whether he has a cheap camera or an expensive and elaborate one, it is impossible to overcome the difficulty that a large number of subjects are not sufficiently well lighted to permit successful snapshots. This does not mean, of course, that no results at all will

be obtained, but that the photograph will not be a good one; it will either give a grey, flat print with poor detail, or where shadows are included, harsh and unnatural contrasts will appear.

Roughly, it may be said that with a fairly cheap hand camera having a lens working at about 1/12 (Kodak 1), sunshine, or sunlight reflected off large white clouds in a blue sky is necessary for a successful snapshot, and this only in summer time. This applies to cameras with shutters marked as working at a speed of $\frac{1}{25}$ sec. which usually means between $\frac{1}{30}$ and $\frac{1}{50}$ sec. With better lenses working at 1/8, as found on the slightly more expensive types of roll film camera, successful results may be obtained in slightly dull summer light and midday winter sunshine. It is clear, therefore, that the beginner is limited in his snapshots almost entirely by the question of light.

Light is very deceptive, and when it appears bright to the eyes it may be weak from the point of view of the camera, as, for instance, sunlight under trees. The only thing that will show definitely the strength of the light is an exposure (qv), meter, and the beginner is strongly advised to make use of one.

The kind of camera referred to is known as the fixed focus type, i.e. there is no trouble with focusing, so long as the camera is held more than a minimum distance away from the object to be photographed everything will be in focus and shown sharply in the resulting photograph. This distance may be taken

subject. The ordinary viewfinder is too small to show detail and the only way to be certain of snapping at the right moment is to look at the object.

Take a breath before snapping and hold it as the shutter release is pressed, this prevents movement of the camera during the instant of exposure. Exposure should be made by a firm and deliberate movement and not sharply, which may mean jerkily. Do not take a snapshot with the sun shining on the lens. With the box-form camera the lens is set inside the box and is fairly well shaded, but with the folding camera the lens mount is shallow and affords little shade for the lens. Sunlight shining into the lens will be found to give flat, musty results.

While perfectly clear photographs are obtained with the sun shining from behind, better results will usually be secured with the sun to one side or a little towards the front, for then some shadows will be included in the picture, which will improve it.

Do not attempt to take distant views and wide landscapes with a snapshot camera. They are beyond its scope.

As far as possible, prevent people staring directly into the camera. The best snapshot are obtained when the subject is not aware that he is being photographed. This applies particularly to children, groups, and street scenes.

Do not be afraid of over-exposure, except by the sea. At least 90 per cent of amateurs' failures are due to under-exposure, though it may not always be recognized. Use an exposure meter, if possible.

When the films or plates have been developed and prints made, there is usually a chance of improving the photograph by trimming it. With a small camera not possessing a focusing screen it is not possible to ensure that nothing but the picture required will appear on the print, particularly in the case of snapshots. In fact, the small viewfinder usually provided with roll-film cameras makes it dangerous to attempt to give the whole of the subject or person snapped, for if this is done there is a probability that something will be missing in the photograph. See, therefore, that sufficient margin is given, but cut it off when the print is made. Many photographs are greatly improved by trimming off unnecessary sky or foreground, or cutting out intruding objects. Examples are given in Figs. 3 and 4.

These photographs, taken more or less by chance from an amateur's collection of snapshots containing many successful pictures, show several faults common to a large proportion of snapshots. One is insufficient care in choosing the view point, getting too far from or too near to the object of the picture. Often a movement of a few feet to one side or forwards will obviate difficulties and prevent



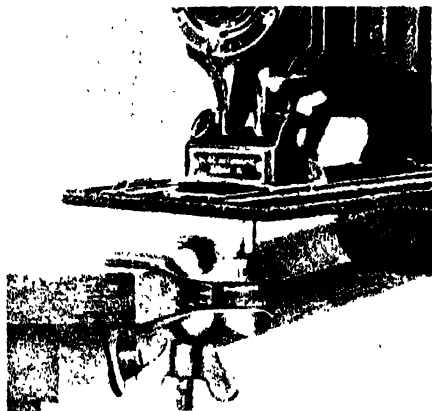
Fig. 3. Improvement by trimming print. Building is falling backward because camera was tilted upward.

background objects bulking too largely or getting too much foreground. Another fault is not holding the camera straight.

If the printing of the snapshots is left to the chemist or photographic dealer he can be relied upon to make the prints on paper best suited to the particular negatives. A matt or semi-matt surface paper gives softer and more pleasing results than glossy paper (unless the sharpest detail is required, as when the photograph is to be reproduced in a new paper or book) and the amateur will do well to ask for his prints to be made on these matt papers.

Do not blame the chemist if the photographs turn out badly. Grey and flat prints are almost invariably due to badly exposed negatives. The modern business of developing and printing amateurs' negatives is so well organized and carried out on the scientific principles of time and temperature development that properly exposed negatives will result in good bright prints. If the results are poor, use an exposure meter.

When the amateur has produced a fairly good proportion of successful snapshots he will usually want to pursue his hobby further. The first step to a complete knowledge is to undertake part, if not all, of his own developing and printing. If he uses roll films he cannot do better than obtain a film developing tank, such as the Kodak or Ensign. He is strongly advised not to attempt hand



Photography. Fig. 1. The tripod, a substitute for a tripod, holding a camera to a fence, walking-stick, or other object, to permit time exposures.

(Courtesy of Kodak, Ltd.)

normally as about 4 yd. It is only necessary to see that no object at a shorter distance comes in the picture as seen in the viewfinder. If it does it will appear blurred and disproportionate in size in the photograph, spoiling it accordingly.

Securing Good Snapshots. The following simple rules, if carefully attended to, will do much towards securing successful snapshot photographs.

See that the object to be photographed is included completely in the viewfinder. Photographs in which the top of a person's hat, or the feet, or the top of a building or other object is cut off are bad. All that is necessary is to get farther away from the object. A little practice at judging distances, experimenting on a friend or an inanimate object at distances from 4 to 12 or 15 yd., will be very helpful.

Hold the camera firmly with both hands and perfectly level. If it is pointed upward, persons and buildings will look as if they were falling backward; pointed downward they will appear to be falling forward.

Look at the object squarely. Practise looking in the viewfinder before exposing, but when exposing, fix the eyes on the



Photography. Faults in amateur snapshots. Fig. 2. Camera not held straight, too much foreground, unwanted piece of sky, and white post clashing in interest with the house.

development until the correct methods semi-automatically obtained by the tank have familiarised him with the appearance of good negatives. Even if he uses plates or flat films, he should employ a developing tank in the same way before he attempts dish development by the dark room lamp.

No written description can convey a clear idea of the appearance of a correctly exposed and developed negative and the amateur without this knowledge who attempts development by the aid of the dark room lamp is almost certain to go wrong. With some films and plates and developers the image flashes up quickly in the developing bath and there is the consequent temptation to take the negative out lest it be over developed, whereas the truth is that after the image has appeared time is required to build it up in the negative. A negative which looks bright and full of detail under the red lamp will give flat and grey prints after fixing, because it has been removed from the developer before development is complete. With other films, plates, and developers the reverse is the case, and the image appears slowly. The safest rule is to follow the scientific methods of development by time and temperature according to the tables given with most developers.

Do not make any attempt to correct either over- or under-exposure by varying the time of development. Older text books are full of "dodges" for correcting faults in exposure, but modern scientific working has proved them to be useless, at least as far as the amateur is concerned.

While still using his camera largely as a hand camera the amateur can enlarge its scope greatly by providing a stand or tripod for it, so that time exposures may be given under the many conditions when snapshots are bound to be failures. Even without a tripod a little ingenuity will find support by pressing the camera firmly against a post, tree, fence, or wall, or placing it on top of a wall or post packed level with small stones. A simple device for fixing the camera is the Kodak Optipod, shown in Fig. 1, by means of which any convenient tree, fence, or even a walking stick may be used. With the latter it is quite possible to hold the camera sufficiently steady to give $\frac{1}{2}$ or $\frac{1}{4}$ sec exposure.

Next, the use of different shutter speed has to be studied. If the camera has only one speed usually marked $\frac{1}{25}$ sec. but actually somewhat slower, this can be overcome to some extent by closing or opening the diaphragm. By closing the diaphragm, i.e. using a smaller stop, as explained under F numbers, the exposure is shortened, and vice versa.

The best way of increasing the range of photographic possibilities is to invest in a camera with a fairly good lens with an aperture of about f 6.8 and, perhaps even more important, a really good shutter giving accurate speeds of from 1 sec. to $\frac{1}{1000}$ sec. It is the lack of a slow shutter speed that is the greatest fault in some cheap hand cameras. With the slower speeds, say $\frac{1}{2}$ or $\frac{1}{4}$ sec., good photographs can often be obtained, the camera being steadied, when a snapshot would mean bad under-exposure.

The amateur must practise the technique of his hobby until he can obtain negatives fully exposed and fully, but not over, developed, sharply focussed, clean, and without stains, holes, spots, scratches, or finger

marks. At the same time, if he is properly ambitious, he will consider the elementary rules in the artistic arrangement of his photographs in the posing of the original subject, whether personal or natural, and in the production of his prints.

Pointing the camera at a beautiful scene and pressing the button will not necessarily produce a beautiful photograph. The camera does not see as the eye. Its range is limited and it is far less selective. Looking at a scene that impresses one, the unimportant and perhaps unpleasant items are passed over and hardly noticed in the general impression of pleasure. The camera sees all and records all with a fidelity that may have a disastrous

result. Some selectivity is therefore essential. A lamp post can be avoided by moving the camera a foot or two to one side. Similarly, obtrusive objects which would fill the foreground of the photograph are often reduced in importance by moving back.

Some Useful Hints.

Following are a few hints which will help in the production of satisfactory photographic pictures, even of the simplest and most unambitious kind.

Do not get objects of different or opposing interest in the picture. In other words, concentrate on the subject to be photographed, and let

the background be no more than background. In most cases it is the foreground that makes the photograph.

Do not have the most interesting object in the middle of the picture. The centre is the weakest point. Keep the principal subject slightly to one side, or slightly above or slightly below the middle. On the other hand, do not arrange the picture so that the eye is led out of it towards the side. A river, for instance, should come out of the picture at the bottom right or left corner, not at the side.

Avoid bare expanses of sky or flat foreground. Trim off the print at top and bottom to reduce these defects. Plain white skies do not exist in nature, and if panchromatic plates or films are not used, so that sky and clouds are included on the negative either print in clouds from a special cloud negative, taken at the same time as the particular landscape, or trim the print down so that the minimum amount of sky is shown.

In photographing buildings, much better and more interesting pictures will be obtained if parts, details such as doors, windows, glimpses down aisles or through arches, are taken, rather than if the whole, inside or outside, is attempted. This rule frequently applies to landscape subjects, particularly wooded scenes, as explained under Landscape Photography.

PHOTOGRAVURE. Photogravures that have been damaged by exposure, dirt or grease can be cleaned by immersion for several hours in benzine in a flat, shallow photographic dish. The dish must be kept covered and no naked lights permitted in the room, owing to evaporation of highly inflammable vapour. Afterwards dry and brush over with clean, soft linen. This removes grease and dirt held by it. Other discolorations can be got rid of by bathing in hydrogen peroxide, 10 vols. strength diluted with 1 part of water, in a photographic dish, the photogravure being exposed to strong daylight while in process of immersion.

An alternative method is to follow the benzine bath with a prolonged immersion in



Photography. Fig. 4. Intended to be a photograph of the distant church, this is mainly a picture of fallen tree-trunks and empty sky. Fig. 5. Cut down print which, if enlarged, would make a much better picture than the original snapshot.

sodium carbonate solution, 2 oz. of washing soda to 8 oz. of water, finishing by thorough washing in running water to remove all soda. See Carbro Process; Printing.

Phthisis. See Tuberculosis.

PHYLLOCACTUS. The phyllocactus has large flat stems, no leaves, and red, white, or pink flowers borne chiefly in summer. It is one of the cacti for cultivation in pots under glass. It should be potted in sandy loam with which broken brick or mortar rubble has been mixed. A sunny, airy greenhouse suits this plant best; it must be safe from frost in winter. Propagation is by cuttings. During summer the phyllocactus needs a good deal of water, but little in winter. There are numerous named varieties with large showy flowers.

PHYLLOSTACHYS. Of this hardy bamboo several species are of considerable ornamental value. A position sheltered from cold winds is most suitable, and deep loamy soil that does not dry out in hot weather is required. Bamboos do not flourish in poor, dry soil. Some of the most decorative species are aurea, which has yellow stems, fastuosa, flexuosa, henonis, and the black stemmed nigra. All are of tall and graceful growth. The old canes or stems should be cut out in April. Propagation is by lifting and dividing the clumps in September or May.

PHYLOXERA. Also known as the vine louse, this small creature is very injurious to vines, and although more prevalent in America and upon the continent of Europe than in Great Britain, it is scheduled by the Ministry of Agriculture as a notifiable pest. An attack can be recognized by the warty or knotty appearance of both foliage and roots. As a rule, the only course to pursue is complete destruction of infected vines, thorough cleansing of the vineyard, and the introduction of new border soil. The Ministry of Agriculture should be notified at once of the appearance of the pest, failing which a penalty may be imposed.

PHYSALIS. This hardy herbaceous perennial plant is commonly known as Chinese lantern, on account of the large red "lanterns" or bladders which enclose the seeds. It is for these decorative lanterns that the plant is grown. Height of the plant is two or more feet, and no staking is needed. White flowers, about an inch across, are produced in summer, and these are succeeded by the large lanterns. The planting season is autumn or spring. The thick, fleshy, yellowish roots should be covered in about 2 in. deep. The plant grows strongly, and the roots travel considerably, so that it is worth the trouble to lift the plants every third year or so, replant the best roots, and discard the weaker and those not wanted.

To preserve the lanterns for winter decoration indoors, the fruiting stems should be cut full-length in September, tied in bunches of a dozen and hung upside down in an airy shed to dry and become quite stiff, the withered leaves then being stripped off. For display, the stems should be placed in vases or jars without water. With an occasional light dusting they remain attractive for months.

PHYSIANTHUS. The evergreen greenhouse climbing plant *Physianthus albus* attains a height of from 10 to 15 ft. It has red and white flowers, borne in early summer. It should be planted in a large pot or tub, and placed in such a position that it can be trained up walls, rafters, or pillars. Propagation is by seeds or cuttings in spring. It is sometimes known as the white bladder flower, on account of the downy and bladder-like appearance of its blossoms.

PHYSICAL EXERCISE AND TRAINING

Hints on How to Keep the Body Healthy and Supple

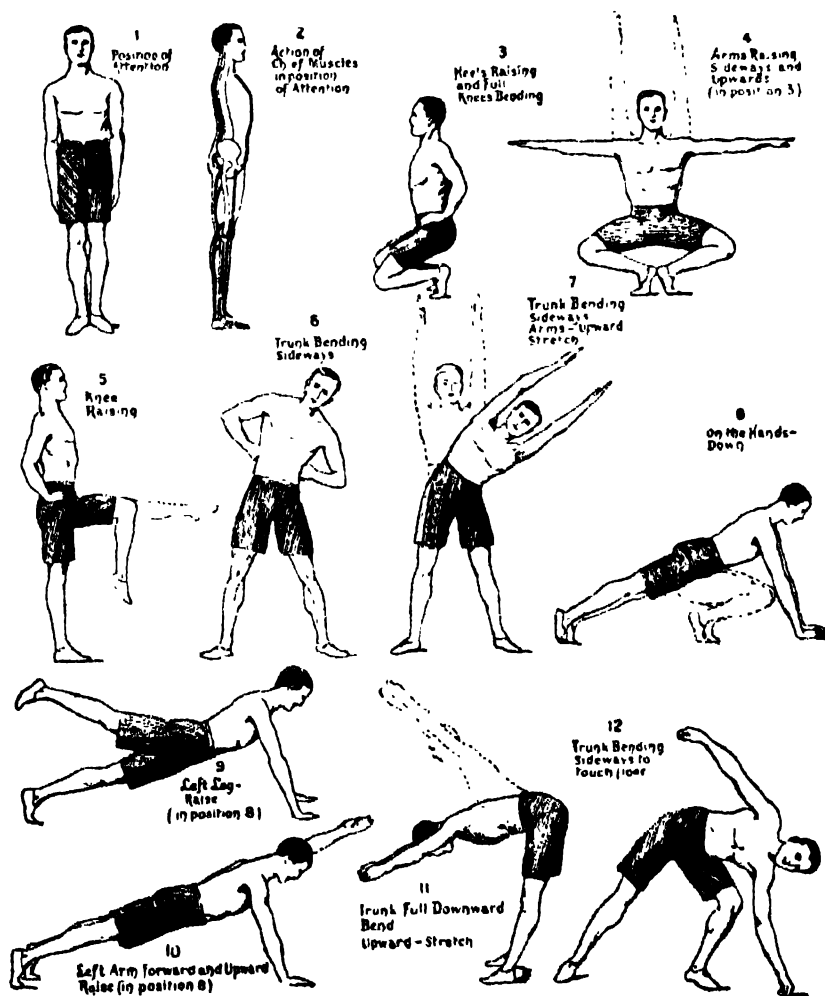
This article describes various exercises beneficial to the body, joints, and muscles of children and adults. Details are given of simple systems of physical training which can be carried out in the home, with a minimum expenditure of time and without elaborate apparatus.

Contrary to a common belief, the sole aim of individual physical exercises or of mass physical training is neither the development of muscular strength nor the production of strength in one part of the body's system. The real purpose of physical exercises is to induce harmonious fitness of the body as a whole, to develop a keen brain, and to improve the functions of the circulatory, respiratory, digestive, and excretory systems, equally with the growth and development of bone and muscle.

From earliest infancy, a child instinctively takes exercise, by kicking its legs and waving its arms, and it should be encouraged to do so, preferably unencumbered by clothes or napkins, after its bath. At a later age, the healthy baby strengthens and develops its back, abdominal, and neck muscles, by raising its head off the pillow and by crawling. As the child grows older it will, if healthy, gain plenty of exercise by running about, and by taking part in organised athletics, and games such as football, hockey, and cricket. If a child is inactive and disinclined to take exercise, it is obviously in poor health or suffering from a physical disability; in that event a doctor should be consulted, and he may prescribe a course of remedial exercises. Some simple exercises for children are shown in Fig. 5.

Adults should continue taking exercise, even if it is only a week end walk or swim, or an occasional game of tennis or golf. Walking in hilly country is better exercise than walking on the level. Cycling is good exercise for the legs, but the benefits derived from it can be negated by crouching low over the handlebars, for this is harmful to the back. In swimming, practically all the muscles of the body are used, while the arm and leg joints are better exercised than in most games. Although a mild exercise, golf is beneficial to the leg, arm, and trunk muscles. It is important to remember that sudden excess of energy in any game or exercise can be injurious without a certain amount of preparatory training.

As no sport or game exercises all the muscles equally, and does not induce full and free movement of the joints of the trunk, limbs, and neck, there are a number of simple exercises which have been evolved to do this satisfactorily if carried out daily. Their performance does not occupy more than a few minutes, and they do not require any elaborate apparatus. Each of the following exercises has been designed for the development of one particular joint of the body. The best time to perform the exercises is first thing in the morning, before an open window, and then



Physical Exercise. Fig. 1. Trunk and limb exercises suitable for daily use where space is limited. The exercises can be carried out in a team, or individually.

Courtesy H. M. Stationery Office

benefit is greatly increased if they are followed by a bath or shower. The whole set of exercises can be performed in about ten minutes.

Neck. Stand with the hands on the hips. Bend the head forwards, and extend it backwards. Turn the head from side to side. Bend the head sideways so that the ear approaches the shoulder, first one side, then the other.

Elbow. Starting with the arms by the sides, bend the elbows until the hands touch the shoulders. This exercise also can be made harder by using dumb bells.

Forearm. With the elbow by the side of the body and the forearm horizontal and palm upwards, grasp the end of a walking-stick so that the stick projects away from the body. Then

upwards; bend the wrists from side to side.

Fingers and Thumbs. Grip stick or dumb bell with fingers and thumb, as in the previous exercise. Hold some article, such as a book, between the tip of the thumb and of each finger in turn, then hold the book between two fingers, taking each pair in turn.

Hip. Standing on one leg, and holding a chair for support, carry the other leg into the following positions: as far forwards and backwards as possible, keeping the knee straight; outwards and inwards; rotate the leg so that the foot points inwards and then outwards. Lying on the back, bend the knee upwards and, grasping it, force the thigh against the abdomen.

Knee. With the hands on the hips, rise on the toes, bend the knees until sitting on the heels, then rise up again.

Ankle. Sitting on a chair, bend the ankles up and down; turn the soles of the feet inwards and outwards.

Toe. Sitting on a chair, bend and straighten the toes; separate the toes, and bring them together. This separating and closing may prove difficult but it can be done.

Trunk. Trunk forward bend and raise up again. In forward bending, the abdominal muscles should be tightly contracted. Trunk side bending. Trunk rotation. Each shoulder



Physical Exercise. Fig. 2, above. Exhibition of mass physical training. Fig. 3, right. The original Ling system of physical exercise carried out as a disciplined movement.

Shoulder. With the arms hanging down by the sides, raise the shoulders, carry them back wards, and lower. With the upper arms drawn to the shoulder level and the forearms flexed to a right angle, rotate the arms by turning the forearms downwards and upwards. Starting with the elbows fully flexed and by the sides of the body, the hands touching the shoulders, extend the arms successively forwards, upwards and side ways. This, which is also a shoulder exercise, can be made harder by using dumb bells.



perform rotation movements of the forearm, keeping the elbow steady by the side.

Wrist. With sticks or dumb bells grasped in the hands, bend the wrists downwards and

is rotated forwards in turn, the pelvis and the hips being fixed. A combination of these trunk exercises consists in bending the trunk forwards, to one side, then backwards, then forwards again. In this way, the upper part of the trunk moves round in circles, while the pelvis and hips are fixed on the chair. It should be repeated, moving round in circles in the opposite direction. The breath should not be held while performing these exercises.

Each of the six following exercises has been evolved for the simultaneous exercising of several joints and muscles.

Exercise 1. This is sometimes known as the "stationary run." Stand erect, with the chin in and the back flat. Raise the right knee as high as the hip, then send it straight down to the ground. Lift the left knee in a similar way, and replace it. Continue the exercise, raising the knees alternately and gradually increasing the pace. With a little practice, the exercise can be repeated up to 100 times without distress. The arms should be swung across the body, the right arm simultaneously with the raising of the left knee, and vice versa. Two special points to remember are, to run on the toes and to keep the back flat. This is an excellent exercise for the muscles of the legs and trunk, and improves the "wind."

Exercise 2. Stand erect, with the hands on the hips. Rise on the toes and, keeping the body erect, lower yourself to a squatting posture with the buttocks resting on the heels. Rise to the full extent, still keeping on the toes. Repeat the exercise up to 10 times. This develops leg muscles, and gives poise and graceful balance.



Physical Exercise. Fig. 4. Children exercising according to the modern Ling system, each child going through movements in its own time and space.

Exercise 3. This is known as the lunge exercise, and is excellent for all the muscles of the limbs and trunk. Stand erect, with hands on hips. Take a step forward with the right leg, bending the right knee. At the same time lunge forwards and upwards with the right arm to the full extent, following the arm with the eyes. The left arm is simultaneously carried backwards and downwards. Spring back to the original position, then lunge with the left arm, bringing the left leg forward. Spring back. Repeat the exercise, lunging with right and left arms alternately.

Exercise 4. Shadow boxing. Assume the correct boxing stance. The left foot should be advanced from 10 to 20 inches, according to height and length of leg. The weight should be balanced between the two feet. The right foot should be placed directly behind the heel of the left foot, and pointing outwards at an angle of 60 or 70 degrees. The left foot should be flat on the ground, and point straight forwards. The right foot should be raised an inch from the ground. Clasp the fists and drive the left hand straight forwards, as if at an imaginary opponent's face. Draw the left hand back, and drive forward with the right hand. Move about, using the hands alternately, but keeping the same relative position of the feet. Put plenty of "punch" into your blows, and try to keep a perfect balance all the time. Shadow boxing is an admirable exercise for every muscle in the body.



Physical Exercise. Fig. 5. Simple movements for exercising the limb and trunk joints and muscles of children. They have the advantage of combining exercise with play. Top left, rabbit hop; top right, ears up; lower left, kangaroo jump; lower right, Jack in the box.

Courtesy H. M. Stationery Office

Exercise 5. Swinging on chairs. A couple of ordinary stout chairs can be used to take the place of parallel bars. Place the chairs back to back and about 2 feet apart, so that when standing between them the hands rest naturally on the top bars of the chairs. Grip the top bars, and raise the body till the weight rests on the arms. Raise the legs as far towards the horizontal position as possible, then lower. Repeat the exercise, being careful to swing as little as possible. This is good exercise for the arms, legs, and abdominal muscles.

Exercise 6. This is a more advanced exercise, and it should be practised gradually. Lie flat on the floor, face downwards. Support the weight of the body on the toes and hands, palms flat on the ground at the side of the body, fingers pointing forwards. Raise the body by straightening the arms and keeping the body rigid, i.e. without bending at the waist. Slowly lower the body, and try to

touch the floor with the chin. Raise and lower the body alternately, touching the floor only with the toes, the palms of the hands, and the chin. Do not allow the knees to bend.

This is a splendid exercise for the arm, thigh, and abdominal muscles, and is recommended for reducing middle-aged corpulence.

Professional physical training instructors use a form of gymnastic drill in which the exercises follow a fixed sequence, and are normally performed by several persons carrying

out the movements to spoken orders and in controlled time. Physical exercise of this type aims at selecting and grading all forms of muscular and joint exercises so that the best use can be made of them for general development, and a good instructor presents them in such manner that they are both interesting and enjoyable. Nevertheless, the principal movements, which are illustrated in Fig. 1, can be carried out equally well and beneficially by the individual at home.

PIANOS: MECHANISM, CHOICE, AND CARE

With Instructions about Doing a Few Elementary Repairs

Owing to the presence of a piano in almost every home, the article is one of the most practical of those dealing with musical matters. Other articles in this group are: *Player-Piano*, *Gramophone*, *Scientific*, *Further Gramophone*, etc.

A piano is a percussion instrument having steel strings struck by felted hammers which are set in motion by the depression of keys. The keyboard consists of a recurring series of long (white) and short (black) keys or keys, seven of the former and five of the latter in each octave. No pianos are now made of less compass than seven octaves A to A, while most modern instruments have this compass extended to C.

Parts of the Instrument. To each note there are three strings (trichord), except in the lower part of the compass, where spun copper covered strings are used, two to each note as a rule, but in the lowest octave of all only one. All these strings of varying thickness and length are stretched from the wrest pin over upper and lower bridges to other pins on the frame, and are subjected to a very high tension, the pull of which in a concert grand amounts to some tons, to withstand which there is a frame of non-corroded

In most modern pianos the strings are made to cross one another, so that the greater length thus obtainable in a smaller case may produce more sonority. This is called overstringing. Behind or under the strings lies the soundboard usually of Swiss pine or fir, joined up and varnished. The action consists of several independent but co-ordinated parts which move when a key is struck and impel the hammer against its string, at the same time providing that it recoils instantly. An important part of the action consists of the dampers, which are small pads of felt lying upon the strings to prevent their vibrating. They are lifted off in the process of playing, and remain off so long as the key or keys are held down. Upon the release of the keys the

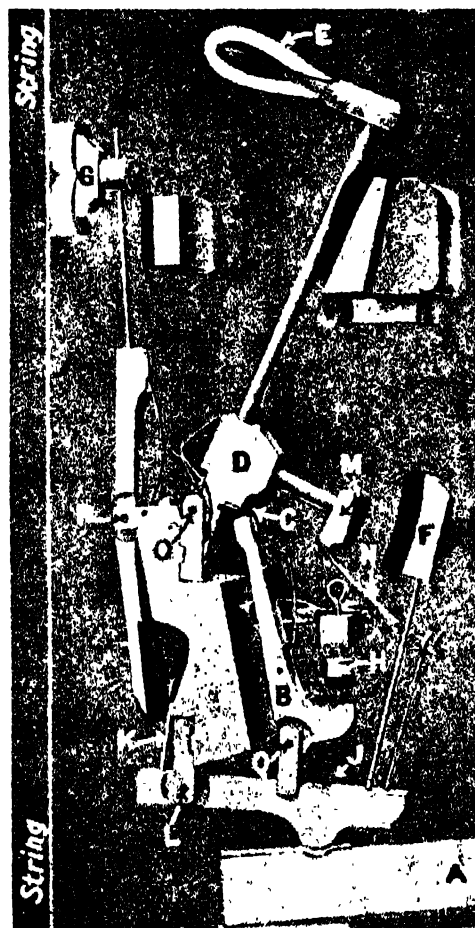
dampers fall upon its string and stop or damp its vibrations. In the very highest part of the compass dampers are not necessary, the extreme shortness of the strings renders the sound very evanescent. The whole of this action is contained within a wooden frame enabling it to be removed bodily.

Lastly, there are the pedals, of which there are usually two. The right or sustaining pedal, when depressed, suspends the action of the damper action, irrespective of the fingers. In a grand piano the left pedal shifts the action, so that the hammer escapes strike two strings of the three. The unstruck one, however, vibrates sympathetically, thus producing a different quality of tone. But in most uprights, either the hammers are shifted closer to the strings so as to lessen the force of impact, or a strip of felt is interposed between the

hammer and the strings. This last is called the celeste pedal. In both instances the very characteristic mellow effect is lost.

When the strings are horizontal the instrument is called a grand or a square, the latter being very rare in Great Britain. The more usual form of instrument is that in which the strings are stretched from top to bottom, known as an upright, of larger make, an upright grand, if of smaller, a cottage piano, smaller still a pianette. Naturally, the larger the instrument the fuller and stronger the tone, because more sonorous strings can be used. As regards the case, this is sometimes of solid oak, mahogany, or American walnut, but as a general rule it is either stained imitation of ebony or rosewood, or it is veneered in good grained walnut.

There are other terms connected with the case which need explanation. The lid is the top of the instrument. It is usually divided



Piano Diagram showing the mechanism of a treble note. A. Key. B. Jack. C. Notch. D. Hammer butt. E. Hammer head. F. Check. G. Damper. H. Set-off button. I. Jack or hopper spring. K. Spoon. L. Carriage centre. M. Check flail. N. Tape. O. Hammer butt centre. P. Damper lever centre. Q. Jack centre.

Courtesy of John Broadwood & Sons Ltd.

into two halves, the front half working on a long hinge. The front panel is immediately below this and upon it are fixed the music rest and the benches. The bottom panel is just above the pedals. The fall covers the keyboard, and is joined to the hollow by a long hinge. In some pianos there is a name board bearing the maker's name, though this is generally placed upon the fall. The trusses are the more or less ornamental supports under the keyboard on the right and left.

Choosing a Piano. In choosing a piano the purchaser should be prepared to spend as much as he can afford, as cheap pianos are seldom good investments. To the uninitiated eye the instrument may appear as highly finished as a more expensive one, and its tone may even seem as good, but it is unlikely to wear well. It is therefore advisable to go to a maker or dealer of reputation, and to avoid places where pianos are a mere side line to other articles. It is best to pay cash down if possible, as most firms are then ready to make a substantial concession. If this be not possible, there is the instalment system. It is usual to have an agreement, and it is well to make sure that it is not one-sided and wholly against the purchaser if he should, by any chance, fall behind in any of his payments.

The first test of a piano is that of the tone. Everybody has his own personal preferences, but in general terms the tone should be full, mellow, and powerful, without any trace of harshness or harshness. A good tone has depth and richness, whereas a poor one, despite apparent brightness, seems shallow and all on the surface, lacking singing quality. Avoid a brittle high register, like playing on glass, and what is called a tubby bass, i.e. weight of tone without richness. If the buyer is also a player, he can judge for himself, but otherwise he should enlist the help of a friend. The tone should exhibit perfect evenness throughout the compass, without a single break. This evenness can easily be tested by playing scales in single notes at various speeds up and down the piano.

The repetition should be perfect. Try several different notes, high, medium, and low, by playing each as rapidly as the fingers can move. Test the damper by playing passages and staccato chords—without pedal, of course—and listen for the instant cessation of vibration. What is termed an underdampening action will be found to give the best results, as the damping is quicker and more effective. Try the pedals and see that they are doing their work well. Pay particular attention to the touch, which should respond to the wishes of the player as expressed through his fingers. Persons accustomed to an old well-worn piano sometimes think that the touch of a new one is stiff, whereas it really is better regulated and more calculated to produce all shades of tone. Notice whether the white keys are ivory or celluloid. The latter substance is more generally used to-day. Ivory is greatly to be preferred, but it adds to the cost. As to the case, the best make-up is distinguished by good taste rather than by assertive ornamentation, which in a well-furnished room is apt to prove an eyesore.

It is quite possible to pick up a bargain in the shape of a second-hand piano, especially when one hears of it privately; also, most makers and dealers have such instruments either returned from hire or taken in part payment for new ones. But the purchaser should be wary of pianos included in catalogues of after-season sales, especially if they are by obscure makers. A second-hand piano should be tested in the same way as a new one, but it is advisable to see, at the same time, if the hammers are much cut by use, and whether moth has attacked the felt, bushes, etc.

A piano is very susceptible to changes in the atmosphere and temperature. It is best placed

against an inside wall, at a fair distance from it; if possible, a cross position is preferable. In no case should it be near the fire, close to a window, or next a door through which there is a strong current of air, all these will cause it to go out of tune.

It is not advisable to place objects such as books, ornaments, or vases of flowers on the lid of the piano. They lead to disagreeable jarring or buzzing, and if water is spilt more damage may be done in a minute than can be remedied in a month. Open the lid frequently so as to ventilate the interior. Condensation of moisture on cool surfaces is common in every room, and this can as easily happen inside the piano as outside it. So-called ornamental covers should also be taboo. The use of insulators or glass cups, though sometimes necessary to protect the instrument from damp, may not only cause inconvenience to the player but also put undue strain on the pedals through raising the piano too high. A foot rest should therefore be used in such cases.

It is the custom for the firm which sells the piano to tune it for 6 months free of charge, after which it is the duty of the purchaser to see that he gets a competent tuner. It is false economy to save a few shillings a year by employing an inferior man. The piano should be tuned at least four times a year, or oftener if it is much in use. Sometimes little defects will develop which should be left to the tuner to remedy.

Cleaning the Piano. Once a year the piano should have a spring clean, for dust and fluff will find their way into the best cared for instrument, and cannot but affect the tone. First open the lid back, and then remove both top and bottom panels by undoing the hooks, buttons or stays by which they are kept in place. Next take off the fall and hollow, which will be quite easily done. To take out the action, turn back the catches on each side, firmly grasp the frame at the sides, give it a slight pull forward, and the whole can be lifted out. It should then be placed upright on the floor in some position where it will be in no danger of falling.

Now remove the keys in regular order from the bottom to the top, and place them on a table. They are all numbered, but it will be convenient to preserve the proper sequence. In removing them, ease them gently off their pins. With a light brush of soft hair, or of feathers, dust down the strings, and then remove all dirt from the bed underneath the keyboard and from the base of the instrument, being careful not to damage any of the baffle bushes. On no account use a duster unless it is perfectly dry. When the cleaning is over, replace all the parts in the inverse order to which they were taken out.

Ivory has a natural tendency to turn yellow with age, but this discolouration may be retarded, even if it cannot be wholly prevented, by cleaning the keys frequently from the dirt and perspiration which fingers are bound to deposit. They can be well rubbed with a chamois leather wrung almost dry, the rubbing is done with the tip of the finger, so as to avoid any damp coming into contact with the wood at the side of the key, each key being immediately dried with a soft cloth.

Very occasionally the ivory may be rubbed over with a little uncoloured methylated spirit, this will help to keep it white. Another recipe which has been recommended is to use lemon juice instead of spirit. If the keys are very discoloured it is best to seek expert advice. The case should be dusted lightly with a soft cloth; hard dusting with harsh material rubs the dirt into the polish, thus destroying its lustre. Never use furniture cream; use, instead, a soft cloth, very slightly damp, sprinkle a few drops of paraffin upon it, and apply it lightly. To prevent any damage from moths, camphor balls may be employed.

Simple Repairs. While the services of a competent tuner should be utilized regularly to keep the piano in playable condition, small breakages sometimes occur in the interval between his calls and cause considerable annoyance by putting the instrument out of use for the time being. Although interference with the mechanism of a piano by an inexperienced person is to be deprecated, there are certain minor repairs that can be undertaken by the handyman. The following hints are intended more particularly for the benefit of those in remote districts who cannot call in the expert at a moment's notice.

Broken Strings. One of the most frequent troubles is the breaking of a string. In the case of a steel string this may affect either one note or two adjacent notes. The portions of the wire that has snapped should be cut off as close as possible to the tuning pins in the wrest-plank and the loose portions carefully drawn out. This prevents any jangling noise in playing the instrument, but it reduces either one note to a monochord or two adjacent notes to bichords, and consequently decreases their volume.

This procedure should be followed in regard to the covered strings, except that the bottom portion need only be eased off the hitch pin and drawn out. In the case of a bichord there will still be one string playable, but a single string note will be dumb. In the latter case care should be exercised, when playing, either to miss the corresponding key or to touch it as lightly as possible to avoid breaking the section of the action. Since there is nothing now to stop the travel of the hammer, breakage of the tape or of one of the flanges of the action may result. The broken pieces of wire or string must be retained to serve as a pattern for replacement.

Broken Hammer Shank. Another occasional mishap is the breaking of a hammer shank. If the fracture is a fairly long one, the two pieces can be jointed together with segotine and bound round with strong silk or linen thread. If, owing to short grain in the wood, the break gives insufficient gluing surface, it can be spliced temporarily by means of a thin piece of light wood glued on immediately in front of the shank, so as to resist the force of the blow, and this splint should be strengthened as before with silk or thread wrapping. Care should be taken, however, not to increase the weight of the shank more than can be avoided, since this, in turn, will affect the weight of the touch.

Where a permanent repair is desired the procedure is to remove the broken piece of shank from the hammer head and butt. This is done by melting the glue in both joints by means of a small blow lamp, or, failing this, a petrol filled cigarette lighter which does not give off smoke. Whatever form of heat is applied, care must be taken not to scorch the wood. When the glue is sufficiently softened, the pieces of shank can be twisted or pulled out. Where the application of heat is ineffective, the shank must be cut off at the point where it enters the head or butt and the remaining piece drilled out. Care must be taken not to enlarge the diameter of the original holes, and the drill must follow the original direction of the holes. This is particularly necessary in regard to the head, and the need for this caution will be appreciated by noting the angle at which the head is fixed on the shank.

Making a New Shank. Before extracting the broken shank it is better to shape the new one. This should preferably be made of the same wood as the rest of the set—mahogany, cedar, maple, etc.—but if this is not readily obtainable a shank can be made from a piece of thin dowelling. The grain should run in the direction of its length to lessen the risk of

the shank snapping under the force of the blow. A piece longer than will be necessary should be cut from the dowelling and glass-papered down to the thickness of the original shank. It should then be slightly filed at one end to fit into the hole in the hammer head. When filing, the shank must be kept turning in the hand to ensure its being perfectly round. An alternative method is to use two long files. One file is laid on a bench or other flat surface and the tip of the shank to be inserted in the head is placed on it. With a stroke of the other file the tip is made to travel under pressure between the two and the fibres of the wood are thus compressed until the diameter is sufficiently reduced to allow the shank to enter the hole and fit tightly but without having to be forced in.

When a satisfactory fit has been obtained a small groove is made with a marking gauge along the tip to allow the surplus glue to escape. To fix the shank to the head a blob of secotine is dropped into the hole and the shank is turned in the fingers as it is pressed home so as to form a ring of secotine at the edge of the hole. The other end of the shank is prepared and fitted into the butt in the same way but the shank must first be cut to the correct length. It is essential that the length should be exact, otherwise the hammer will not hit the strings at the correct nodal point and impurity of tone will result.

To arrive at the correct length, the measurement of one of the adjacent hammers is taken from the small centric pin in the flange (to which the butt is hinged) to the centre of the wooden portion of the hammer head. This measurement is usually about $5\frac{1}{2}$ in. but it may be slightly more. The new hammer shank is then roughly tipped to allow it to enter right down to the bottom of the hole in the butt. The measurement of the new shank is then taken from centre pin to centre of head and the difference between this and the first measurement cut off the new shank. The latter is then re-tipped and fixed in the butt as already described. To allow the hammer to be turned to form the ring of secotine the tape should first be carefully taken off the check wire.

Replacing the Hammer. In replacing, care must be taken to see that all the parts of the action are in their correct position. When forming the ring, the hammer head must be left in correct position, and to ensure this the hammer is carried forward to its note and the nose of the hammer placed in contact with all the strings forming that note.

In many pianos, especially overstrungs, the hammers are on the slant, and the new hammer must be in line with its neighbours to prevent fouling. To obtain this slant the tip of the shank that enters the butt, after being prepared, is filed slightly on the side opposite to that to which it inclines. Should the hammer after fixing not be quite in correct alignment it has to be "cast." This is done by heating the shank—the petrol lighter will serve for this purpose—and bending it either with the fingers or pliers in the required direction. The hammer should be held in position till the shank has cooled and set. This operation must be performed gradually and repeated till the required position is attained. The butt should be held firmly while casting, to prevent strain or breakage, and the casting should not be done till the secotine has thoroughly hardened. Should a hammer head become loose this can be easily refixed with secotine, care being taken that the head is in correct position in regard to its neighbours and its note as already mentioned. A broken tape can be temporarily repaired by fixing the broken ends with secotine to a backing of narrow tape.

Repairs to Keys. In regard to the keys, a scraping or creaking noise is sometimes caused

by a chip or shaving on one key rubbing against another. This should be removed with a chisel working the way of the grain. Should two keys rub together at the front the piano has to be opened out and the faulty key taken off the pins. Underneath the front of the key will be found an oval-shaped pin. This should be very slightly turned with the pliers so that its flattened side inclines to the front only just sufficient to give clearance. If turned too far, or if the pin is roughened with the pliers, the key will stick. If clearance between two keys cannot be obtained in this way it means the key has warped and requires the tuner's attention.

Where an ivory or celluloid front or head has come off a key these can be readily refixed with secotine after the old glue has been carefully removed from both surfaces. Ordinary glue should not be used for fixing celluloid, as it is apt to cause discoloration.

The Pedals. In regard to pedal troubles, an annoying squeak sometimes occurs. This may simply mean that the pedal hinge requires oiling, but it may also arise from two rockers rubbing together or the front rocker fouling the inside of the bottom door. Where this occurs sufficient wood can be removed with a chisel from the offending rocker to give clearance. The replacement of a broken pedal is better left to the tuner.

PICKLE. Foods steeped in a preservative, such as salt, prepared brine, vinegar, or some similar acid, are known as pickled or pickles. Vegetables such as onions, beetroot, red cabbage, and cucumber are either pickled separately or together. Fish or meat may be pickled, as, for example, salmon, herrings, pork, or beef. Walnuts or tomatoes also may be pickled, the former alone, and the latter usually as an ingredient in a mixed pickle.

An excellent pickle is made with celery and tomatoes boiled with vinegar, sugar, and spices in the proportion of 2 heads of celery broken small to 9 tomatoes, 1 breakfastcupful sugar, $\frac{1}{2}$ breakfastcupful vinegar, 1 table-spoonful salt, and $\frac{1}{2}$ teaspoonful each cloves, allspice, cinnamon, and mustard. All the ingredients should be brought slowly to boiling point in a preserving pan and simmered for $1\frac{1}{2}$ hours. While hot the pickle should be poured into jars or bottles and sealed up.

Some vegetables require a more highly spiced vinegar than others. Cauliflowers pickled separately should be cut into sprays, soaked for 9 days in brine, blanched for 10 min., dried and put into jars with spiced vinegar poured over them. To make this allow $\frac{1}{2}$ oz. mixed pickling spice to 1 pint malt vinegar, boil, add 1 teaspoonful salt, boil again for 5 min. Strain over the cauliflower and allow to grow cold before putting into jars. Always tie pickles down very closely, and after a week or two, if the vinegar has been absorbed, fill up the jars with a further supply. For French beans, lay in brine as for cauliflowers, then boil them in the liquor, adding a tablespoonful of vinegar until they acquire a good green colour. Use the pickle vinegar hot.

For cucumber pickle use very small cucumbers. Rub them all over with salt, then cover them and leave them for 9 days, turning them each day. Drain and cut them into cubes, and lay them in a basin lined with well washed and dried cabbage leaves. Pour over them enough boiling vinegar to cover them, lay over the top more leaves, and leave them in a warm place all night. Next day strain off the vinegar and drain the cubes. Prepare the basin again, using fresh leaves; arrange the pieces in it and pour the vinegar over them again, after boiling it up. Cover as before with leaves and set to steep. This process must be repeated for 2 more days, when the colour of the cubes should be much improved. Now put the cucumber into jars, boil up the

vinegar with pickling spice, let it go cold, and fill up the jars.

Onions should not be used for about a month after pickling. Peel a pint of the pickling variety, sprinkle with salt and leave overnight, then put them into some boiling spice flavoured vinegar. The latter may be prepared from 1 pint white wine vinegar, $\frac{1}{2}$ oz. allspice, $\frac{1}{2}$ oz. white peppercorns, 1 or 2 cloves, and 1 teaspoonful salt. Let them boil, and then simmer for a few minutes and skim the top before putting in the onions. The whole should cook for about 5 min. before being poured into a jar and tied down.

Piccalilli. This mixed pickle is composed of various vegetables cut into portions and flavoured with hot spices. It is made as follows: Prepare a small cauliflower and cut the flower part into neat pieces, peel $\frac{1}{2}$ pint button pickling onions, string 18 French beans, peel 12 small shallots, then cut into cubes 4 oz. vegetable marrow, also prepared, and wipe 12 gherkins.

Soak these vegetables in brine with 3 or 4 capsaicums for 9 days, but dry them well before pouring on them the following pickle, also add 3 cloves of garlic. For the pickle, to 1 quart white wine vinegar add $\frac{1}{2}$ oz. salt, $\frac{1}{2}$ oz. sliced ginger, $\frac{1}{2}$ oz. cloves, 1 dram each mace, black pepper, and white pepper, and $\frac{1}{2}$ dram cayenne pepper.

Steep the spices in the vinegar, letting it remain in a warm place for 3 days, then boil it up slowly. Mix 2 oz. dry mustard and $\frac{1}{2}$ oz. turmeric to a thin paste with a little cold vinegar and add to the boiling spiced vinegar. Now add the vegetables and boil all together for 5 min., then set to cool, and when quite cold put into jars. If very hot pickle is not desired, lessen the amount of cayenne pepper.

If all these vegetables are not obtainable at one time, make up the pickle with those which can be had, and add the missing ingredients as soon as available. This pickle improves with keeping, so that a little delay in finishing it will not harm it.

Pickled Herrings. Soused or pickled herrings can be bought in a prepared form, and are then ready to eat immediately, or the fish can be soured at home (see page 585). Dutch pickled herrings are imported in fat tins. To prepare these, wash thoroughly and soak for 2-3 hours in milk. Cut off the heads and tails, and divide the fish into fillets about 1 in. thick. Pour vinegar over them, or a sauce composed of 3 tablespoonfuls salad oil, 2 tablespoonfuls mixed vinegars, such as chuli, tarragon, herb, or tomatoes, and 1 teaspoonful each chopped parsley and shallot, and a seasoning of pepper.

The herrings can be garnished with slices of hard-boiled egg, and root chervil, or some suitable salad herb, or a well mixed plain salad, can be served with them. Salt should be sprinkled to taste.

Pickle Fork. This is usually made of silver, or electro-plate, with a handle of bone, ivory, mother of pearl, or plastic; or the fork can be entirely of metal. It is narrow, so that it can be passed easily into a narrow-necked jar, and its prongs are sharp. A variation is a telescopic fork. This can be lengthened, so that when the pickles are low in the container they can be reached without undue effort. A substitute for a pickle fork has its lower end shaped like two spoons, these open and close when the spring-top is manipulated.

PICK-UP. This is a device for reproducing gramophone records electrically, and it is used in conjunction with a radio receiving apparatus. The pick-up is the electrical equivalent of the sound box used in the ordinary gramophone, and in its elementary form may comprise a permanent magnet having an

armature arranged so as to pivot freely between the magnet pole pieces. The armature can have a cluck for holding the gramophone needle or alternatively the needle itself can form the armature. A winding of silk or enamel-covered copper wire surrounds the magnet pole pieces of the armature.

In operation, the needle, and therefore the armature, vibrates in sympathy with the undulations of the sound channels on the record, thus causing changes in the magnetic field produced by the permanent magnet. These changes are communicated to the coil winding, and voltages are set up across its ends. These voltages are then applied by way of the pick-up leads to the grid and negative filament, or grid bias negative, of a low-frequency amplifying valve, and magnified up to a strength sufficient to work a loud speaker.

A pick-up necessitates careful and skilled design in order to avoid unpleasant resonances and undue wear of the record. A good pick-up used in conjunction with a properly designed low frequency amplifier and a cone or moving coil loud speaker will give excellent reproduction over the range of musical frequencies covered by the record.

The average pick-up is highly sensitive, and in two low frequency amplifying stages will often give a loud volume for the average room. With less sensitive pick-ups, the detector valve of a radio receiver using two low frequency stages can be arranged so as to act as an additional amplifying valve, the pick-up current being switched directly into the grid circuit of this valve.

Switching in the Pick-up

A single pole change-over switch is required, the connections being as follows. The lead joining the grid circuit to one side of the grid lead to the grid of the detector valve is disconnected from the grid terminal on the detector valve holder, and transferred to one side of the change-over switch. The centre or common terminal of the switch is connected to the grid of the detector valve, and the remaining terminal on the switch is joined to one side of the pick-up. The remaining side of the pick-up is connected to the 1½ or 3 volt grid bias negative socket in the grid battery.

Thus in one position of the switch the circuit functions as a radio receiver in the normal manner, whilst in the other position of the switch the pick-up is connected in circuit with the low frequency amplifier, the high frequency side of the receiver being disconnected. This switching scheme can also be used in receivers which incorporate only one low frequency stage.

If a volume control is not already included in the low frequency circuit of the receiver, it is advisable to connect a potentiometer having a suitable resistance value directly across the pick-up itself. This method, in addition to providing an efficient control of volume, also prevents overloading of the first amplifying valve.

The pick-up leads should not be permitted to trail across the set, or to become entangled with the loud speaker lead, since this is liable to cause a short circuit. See Gramophone

PICNICS: SUITABLE FARE AND ACCESSORIES

How to Plan, Pack, and Serve in Appetising Fashion

Suggestions for menus and special picnic ware are given in this article. See also the entries: Lunches on Salads Sandwich

Whether a picnic is at the bottom of the garden, in a hut on the beach, or in some far distant beauty spot, its essential characteristic is lack of formality. In summer, when sunny days permit, tea, luncheon or supper out of doors can be a delightful form of entertaining guests or of varying the monotony of home meals for the family, especially during holiday times. Success in all cases though is mainly dependent on a factor outside the control of the organizer or hostess, namely, the weather, is also subject to good planning, good fare, and a suitable location.

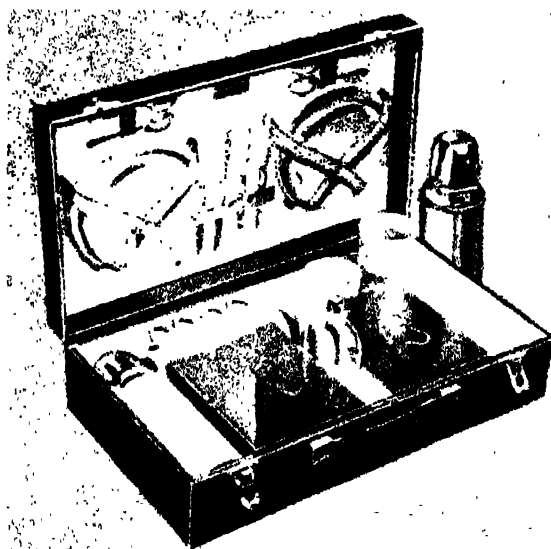
The meal selected is a matter of choice, though tea picnics are the most usual, mainly because they are the easiest to arrange. When the entertainment is simply and solely a picnic for children, where tea is served and games played afterwards, woods are popular for the actual meal, but there should be an open space near for the games. Rounders is often part of the programme, and sports with prizes are sometimes organized. The ideal place may be some distance away, and means of locomotion have to be studied. A small party may pick into a car, a larger one may have the use of cars which are lent by friends, but where a number of children are being entertained, coaches or a private omnibus may be hired, a method which usually gives great enjoyment to the guests.

The food need not be elaborate for such a picnic, but there must be plenty of it. It is astonishing how hungry people get in the open air. The food does not mean that any thing is good enough to offer the guests. The bread used for the fish paste, egg and cross, mustard and cross, and cucumber sandwiches should be both brown and white and as fresh as is consistent with not making crusts. Crusts are better left on, both for reasons of economy and also because the sandwiches keep a better shape. Bridge rolls, slightly sweetened toasts, and currant bread are all excellent for children's tea picnics, whether only buttered or sandwiched with jam, honey and sliced banana, walnuts and raisins, or lemon curd. Butter should be creamed before spreading, and fillings should be generous enough to prevent any repetitions of dry or dull fare, but not so generous that they ooze out uncomfortably at the first bite. Bought sandwiches are seldom the success that nicely

homemade ones are. To keep the bread fresh, wrap the sandwiches in waxed greaseproof paper first, then fold up in wet butter-melin.

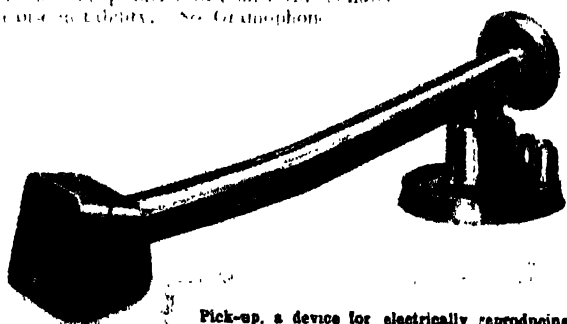
Very rich cakes are not only too expensive, but out of place at such a picnic. All the sponge mixtures are liked, including jam sponge sandwiches, Swiss rolls, simple layer cakes and sponge fingers. Rock cakes, dough-nuts, and the various plain and fruit buns are also suitable, while a tin of good mixed biscuits and another of ginger nuts are a stand-by at a large party. Fruit that is simple to pick, such as apples, bananas, oranges and cherries, is a good choice, and better than too many sweets or chocolates. But these may be provided for the finish of the entertainment, or done up in fancy boxes and coloured paper, and given away as prizes for the games.

Plenty to drink is an essential factor of success, but it need not all or always be tea. When a large number of children have to be catered for, it is often difficult to make tea for everyone. Home made lemonade in concentrated form sometimes solves the difficulty, it water to add is either carried or obtainable from some cottage near at hand. Each child at such a picnic usually brings his own mug. Tea is provided in vacuum flasks for the grown up members of the party, or a kettle, thermos, and stove are part of the equipment. Some children, however, would regard the picnic as a failure unless they were allowed to collect sticks, lay a fire and boil the kettle for tea. Lemonade is useful even when tea is also provided, as everyone gets thirsty after playing games.



Picnic Fig 1. Luncheon and tea outfit for four persons. The gaily-coloured ware is non-fragile, very light, and easily packed. Courtesy of Messrs. Beal.

Picnic Luncheons. The same type of fare can be taken for the family luncheon on the beach, or when blackberrying some distance from home, if the sandwiches have more substantial fillings, or home-made Cornish pasties, veal and ham pie, or patties (these last are convenient because they do not necessitate knives and forks) are added to the menu. A hotovy or any other savoury hard-boiled egg dish and individual salads packed in cardboard cases, with a box of small Gruyere or other cheeses to be eaten with buttered bread, rolls, or biscuits, are also simple to prepare. Home-made potato and onion salad with ham and tongue or beef sandwiches make a favourite meat course. Creams and jellies may be taken in their moulds. Tomatoes and soft fruit can be carried in punnets. Raspberries or strawberries should be well covered with cabbage leaves and placed so that they will not be crushed in transit. When a picnic is given with a view to entertaining guests in an informal manner,



Pick-up, a device for electrically reproducing sound-track of gramophone records



a slightly more elaborate equipment and, consequently, more preparation. Where practical, it is a good plan for the hostess to name in the invitations an hour when she will ring up the various guests to confirm arrangements. This obviates the bad weather uncertainty. Often if all preparations for food have been made and the ensuing day proves wet, the party can be given in the house, and the guest will enjoy a help yourself cold luncheon almost as much as the proposed picnic. A good menu would be either anchovy eggs or prawns in aspic, chicken and ham (in portions), or veal and ham pie, or chicken sandwiches, salad, fruit jelly, and cheese, burnt sandwiches, or cheese straws, and a variety of small Genoese pastries. If fruit salad is taken it may be packed in a container with a screw lid, and cream is better whipped before starting and taken in a glass jar with a screw top. Maximum use dressing for the salad can be packed in the same way. Coffee may be carried in a vacuum flask either hot or cold. A jar of pickles may be added and condiments must not be forgotten.

For a grown up party a cocktail is something needed. This is best carried in a shaker containing a vacuum for freezing mixture. A pleasant non-alcoholic drink to vary lemonade is ginger ale punch, made from 3 oranges, 3 lemons, 2 grape fruit, 1 pint ginger ale, 4 oz. castor sugar and 1 pint water. The juice is squeezed from the fruit and the ginger ale, water and sugar added and allowed to stand. Some people take a large jug, squeezer and ingredients and make this punch on the spot. Menus for picnic suppers are exactly the same as for luncheons. For moonlight parties hot soup and hot coffee are generally appreciated.

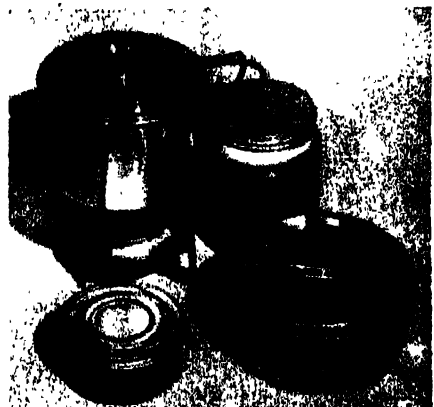
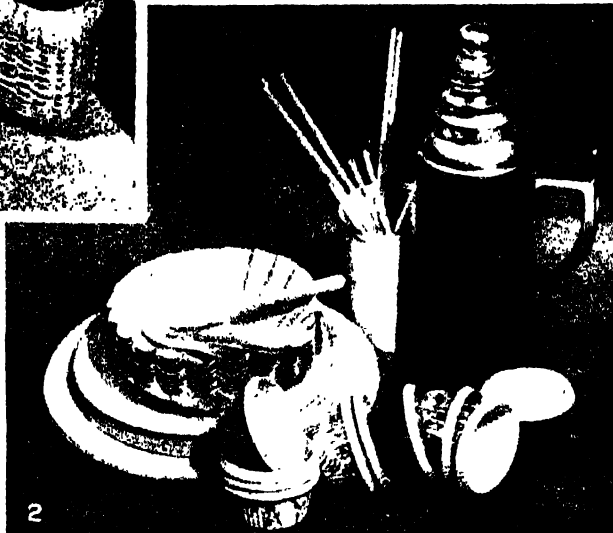


Fig. 4. Desirable accessories, in aluminium, include a billy-can, glass-lined jars, and food carriers, with screw lids.

Picnic Accessories. A ground sheet of mackintosh covered with a rug makes good seating accommodation for children. A few cushions can be carried if the picnic is by car and add to the comfort, while a folding table and chairs which stow away into a suitcase are other useful pieces of equipment. Picnic bags for holding vacuum flasks upright and cases of picnic ware in place of the more old-fashioned

The soufle dishes to hold individual portions of creams or jellies (these can be poured in hot and left to set), the spoons, and straws, cardboard tumblers, salad trays, meat and cheese plates, also shown, are convenient items, none of which is very expensive. The willow pattern paper maché plates seen in Fig. 3 are a change from white ones. Picnic flasks and jars, wicker-covered with screw stoppers, are extremely useful. Cane or cardboard spoons, knives, and forks, are worth buying. Checkered paper cloths and napkins provide a pleasing note of colour.

Aluminium accessories include those shown



Picnic. Fig. 2. A jug-shaped vacuum flask is convenient for hot coffee. Cardboard plates covered with waxed paper, salad trays and cases to hold individual portions of jelly are useful items. Fig. 3. Wicker-encased bottle and jar, cane spoon, fork and knife set, willow-pattern plates and checkered paper napkins make a simple but attractive spread.

baskets are made to suit all requirements. The case illustrated in Fig. 1 contains a complete outfit for luncheon and tea for four people and is very light in weight. The plates, tumblers and cups, of non-breakable ware in brilliant colours, and food containers, flasks, spoons and knives are all packed into a conveniently small space. Tumblers in the same ware are obtainable in a separate leather case, and plates, cups and saucers may also be purchased singly as required. A useful accessory is a combined corker and stopper opener.

Tea if carried in vacuum flasks should have milk and sugar packed separately. An excellent idea invented for use with a thermos flask is a teapot. This simple but ingenious device provides a method for brewing tea when required. The flask is filled with boiling water, tightly corked until tea is wanted when the requisite number of spoonfuls are placed in the infuser which is provided with a hook for attachment to the rim. When put into the flask the beverage is quickly ready to serve freshly made. Should ice cream be a part of the menu, a general-purpose thermos jar is obtainable with wide opening to permit easy filling, emptying and cleaning. Separate containers can be stowed inside such a jar when it is wished to take severaliced or hot dishes, the food being retained hot or cold for several hours. Another method for providing ice cream at a picnic is to take a half-minute freezer (see page 482).

The vacuum jug shown in Fig. 2 is particularly useful for carrying hot coffee

in Fig. 4. The glass-lined jars are most practical for butter, jam, pickles, or whipped cream. The boiler or billy can for use with stove and solidified methylated spirit packs into small space for picnic use. Collapsible sandwich tins are other convenient items for packing. A small model oil-stove has two burners, and the whole folds up into a case. This is most useful for picnic meals on an extended scale when camping or touring and more hot food requires preparation daily.

PICOT In needlework a picot is a tiny loop, and a picot edging is a favourite trimming for the edges of such soft materials as crepe-de-chine, satin, tulle, net, voile, and even lace. These looped edges are very easy to work, and are usually carried out in

embroidery cotton or in silk. One effective type of picot edging is shown in Fig. 1. It consists of a series of small loops of embroidery thread, between each two loops a simple oversewing or buttonhole stitch being made in the material, to ensure that if one loop is accidentally dragged, it will not pucker up the rest of the loops. Although this edging is easy to work, care has to be taken to make the loops of an even length, otherwise the effect will be spoiled. It should also be noted that the edge to be trimmed must

Fig. 1

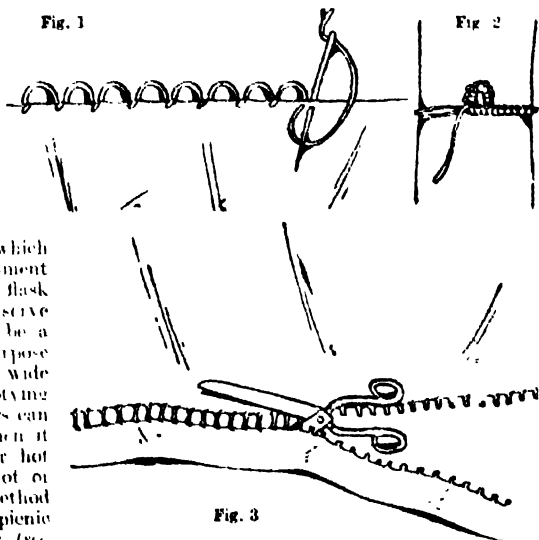


Fig. 3

Picot. Fig. 1. How to make an ornamental looped edge. Fig. 2. Buttonholed picot used in openwork embroidery. Fig. 3. Substitute for picot formed by a cut line of hem-stitching.

first be neatly faced in or hemmed. Commence at the left-hand end of the edge by pushing the needle through the material from the back to front. Carry the needle a little farther along towards the right, and again push it through the edge in the same way, and draw through the cotton or silk until a loop of the size desired is made; then make a tiny buttonhole stitch in the material immediately to the right of the loop. Continue in this way along the edge, and fasten off on the wrong side.

Another type of picot is shown in Fig. 2. This is a buttonholed picot, and is much used in Richelieu work to decorate the many buttonholed bars or strands which form the open-work part of this embroidery. A trimming for collars, cuffs, or house linen can be made by buttonholing the material edge and working these picots at frequent intervals. The edge that is to be decorated in this way need not be previously neatened, because the buttonholing will itself make it quite neat.

Commence by buttonholing along the edge of the material beginning at the right-hand end, then when the position at which the first picot is to be made is reached, work 3 more buttonhole stitches. Carry the needle back to the right, and slip it through the head of the first of these 3 stitches, and draw through to leave a tiny loop of the cotton or silk. Buttonhole stitch along this loop in the same way as a loop is made for fastening purposes, and when the left-hand side of the loop is reached, proceed to buttonhole the edge as before, until ready to make the next loop.

If desired, the loop can be made thicker by carrying the needle back to the left side before buttonholing it, slipping it through the

last stitch, and then carrying it back to the right-hand side, as before. In this way there will be 3 strands of cotton in the loop over which to buttonhole. If the loops are set fairly closely together, the edging is a pretty finish for table mats.

Imitation picot edging is formed of a line of hemstitching which is worked by machine, and afterwards has the outer cord cut away, to leave the cut bars of the hemstitching forming a series of cut ends, as in Fig. 3. To obtain this picot, simply run a coloured tacking along the edge that is to be trimmed, and take the fabric to a sewing-machine shop to be hemstitched along this line; then cut the outer cord of the hemstitching away. With this edging there is no need to hem or face in the edge of the material.

There are many other picot edgings. A length of crochet chain, for instance, sewn along the edge of a tray cloth or runner in a series of loops is very effective, or it may be worked directly on to an open meshed material, passing the crochet-hook through the edge after each loop of chain is made, and making it secure by means of a double crochet. Picots in crochet are chiefly used to form a background or filling for Irish crochet and to make a picot edge on narrow edgings and laces. See Crochet; Embroidery; Richelieu Work.

PICOTEE. This old type of border carnation has a narrow band of colour at the edges of the petals. There are two types of picotees, the white ground and yellow ground, the edge being of various colours—rose, red, purple, or scarlet. Picotees need the same cultivation as border carnations.

PICTURES AND PICTURE FRAMES

How to Hang and Frame Prints and Paintings

This article is one of those that deal with decorative accessories for the home; others being: Curtain; Mirror; Rug. See also: Corridor; Drawing Room; Living Room; Panelling; Passe Partout; Queen Anne Style; Victorian Style.

A picture is one of two things, either simply a decoration upon the wall, or else the illusion of a landscape or figure subject seen through a hole in the wall. Frames for the first type of picture should be merely borders, or part of the whole scheme of the picture; for the second type they should have some solidity or depth, which gives them power to divide the picture from their surroundings.

The earliest frames were architectural in design. Most pictures being painted for churches, altarpiece frames were in the same character as the arches of Gothic buildings. The Italian frames of the Renaissance period were made exactly like doorways and windows enclosing painted portraits and classical figures with an illusion of reality. The frames had the same upright columns, lintels, sloping base lines and pediments of the windows and doors of the period.

With the introduction of landscape painting pictures became popular and enclosure for protection was necessary. Metal frames finely decorated with leaves and festoons were produced in France. Gilded and carved wood and gesso decoration followed, and many beautiful frames were designed in England. At the beginning of the nineteenth century it became the fashion to frame everything from a miniature to a huge landscape in gilt frames to match, irrespective of style of picture. Later in the century the walls of living-rooms were completely covered with pictures, the gilded frames of which were usually of more importance than the paintings.

To-day framing varies from the strip mouldings, cut in lengths and mitred at the corners to the specially designed carved frames taking into consideration light and shade effects and period of pictures. The art of framing and hanging pictures is governed by three things—place, picture and period. With regard to

place, there should be general agreement with surroundings. In modern rooms a few prints and pictures of the decorative type look well when framed or re-framed to suit the furnishing schemes selected. Flat frames of harmonious colour are the best choice. Old frames do not mix happily with modern ornamental accessories.

Pictures of the second type of interest, historical, portraits, landscapes or figure pieces, must be considered on their own claims. Sometimes they are too heavy for the living-rooms, but may look well in the hall or on the staircase. Oil paintings require well recessed and not flat frames. Carving is added so that light and shade shall play on the surface of the frame. In this style of picture such framing does not detract from the interest, but adds to it. The frames should also possess such features in their designs as connect them with the school to which the painting belongs in style and period. These features may be studied at big picture galleries with representative collections. Another interesting thing to note is that mouldings and ornaments will correspond with those in use on furniture, etc., of the period and the influence of Chippendale, Robert Adam, and other great designers can be seen.

Generally speaking, a better effect is gained by hanging pictures, with the exception of one over the mantelpiece, at the same level all round than by arranging them at different levels. An example of such good placing is seen in the illustration of a living room in page 724, Fig. 4. On panelled walls such as are there shown, any haphazard hanging or mixture of frames would spoil the decorative scheme of the room. The tendency is to hang them too high; the lower edge of the picture itself, not of the frame, should in most cases be on the eye-level of the beholder when

standing. By inclining the frames slightly forward the reflection of the glass is avoided and also the accumulation of dust.

Care of Pictures. Old frames should never be regilded without discrimination, especially as much modern gilding is far from being durable. The brass hooks used on picture-rails tend to disintegrate where gas is used, and may cause pictures to fall. Heavy frames should be supported by three vertical wires or chains, because this minimizes the risk attending the slipping of one of them. When the glass is being cleaned pads may be placed behind the upper edge of the frame to keep the picture rigid; otherwise the supports may become dislodged. Fly-marks may be removed by a damp cloth or brush, the spot being dried immediately after. Mildew will usually brush off. If for any reason a canvas is unglazed, it may be kept in condition by means of a dry feather and a silk handkerchief.

The task of cleaning or restoring pictures is best entrusted to an experienced person. If they are antique canvases, covered with the grime of generations, they may without much risk be sponged over with warm water. Soap should not be applied without experience, and acid and alkaline fluids are risky. The darkened condition of many pictures is due either to the excessive use by the artist of siccatives, or to the action of time. Such pictures cannot be properly renovated, and when they are retouched or repainted the modern pigments may not age in the same way as the original ones, so that the picture comes to look patchy and unpleasant. Sometimes the original canvas has been so weakened that it needs rebacking. All these vicissitudes demand much skill in their treatment.

Hanging Pictures. Pictures should be suitably framed and hung against a background that will enhance their beauty. A picture rail is a convenience where large pictures are to be placed, except in a panelled or period room, when, unless the pictures can be themselves treated as panels, they must be placed with great discretion and hung so that neither wires nor supports show.

It is not a difficult matter to fix a picture rail. The succeeding article on this subject should be referred to. Brass hooks for the picture rail can be obtained with a stamped decoration (Fig. 1), or plain.

The best way of hanging pictures on walls not provided with rail or rods is by means of one of the picture suspenders which can be obtained from the ironmonger. That shown in Fig. 2 is attached with long fine steel pins driven into the wall at a slight inclination, and will hold a picture up to 50 lb. in weight. Another form of hook shown in Fig. 3 is fixed with a single pin, and is made in sizes to hold weights of 30, 40, 70, and 100 lb.; the method of fixing is shown on the right. These pins are intended for plaster walls; for brick faced

walls the best method is to use an ordinary stout brass-headed nail, but the wall should be plugged first. This may be done by using a small cold chisel and then filling the hole with a wooden peg, or by the fibre-peg method. Ordinary cord is convenient for hanging small pictures, but it is not advised for heavy ones. Stranded picture wire is much more

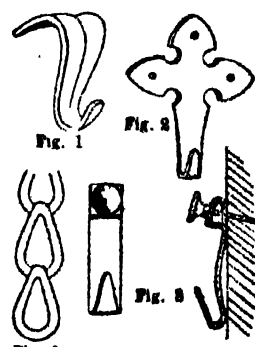


Fig. 1. Picture Hanging. Fig. 2. Hanger for wall with no rail. Fig. 3. Hanger fixed with a single steel pin. Fig. 4. Brass picture chain.

suitable for general use. Brass picture chain as shown in Fig. 4 is known as patent chain, but ordinary brass jack chain with plain round double links can be used. Stout brass screw eyes should be fastened in the back of the frame about half-way down the width of the top piece. Pictures that require a tilt should have the screw eyes about a quarter of the way down the sides of the frame.

In hanging a picture, sufficient wire or chain should be provided to support it at the approximate height; the final adjustment is made by shortening or lengthening the wire at one of the screw eyes at the back of the frame. Although a single length of wire attached to two screw eyes and supported on one hook will be sufficient for pictures of ordinary size, it will be necessary to use two separate lengths for heavy oil paintings or large engravings. Stout screw eyes should be driven in the frame, and the chain carried vertically to nails or hooks on the rail.

Picture Framing. Although the majority of picture frames are put together with the mitre joint, one which is usually regarded as troublesome to deal with, there is nothing specially difficult about it if proper tools are used. A fine backsaw is the first requirement. It is almost useless to attempt to use a coarse one, as it is sure to splinter out the grain, and will probably ruin the mitre block on which the mitres are cut. The mitre block is a device for cutting mitres accurately without elaborate marking out. The important point about it is that on no account must the saw be forced in it. It is purely a guide for the saw, so that the latter must run freely in it.

A useful appliance, though it is not an absolute necessity, is a mitre cramp. This holds the parts of the joint firmly together whilst the nails are being driven in. A hammer and punch are also needed. The Warrington type hammer is the most convenient, but practically any kind of carpenter's hammer can be used.

Materials. It is usual to buy picture frame moulding ready made, as it is so cheap and cleanly finished that it does not pay to attempt to make it. All sorts of patterns are obtainable. Some are in plain wood, oak or some other hardwood, and may be just moulded or be partly embellished with an embossed design. The latter type looks attractive, but calls for extra care in mitreing because the pattern must be balanced.

Another type of moulding has a highly polished surface of composition. Here, again, care is needed in order to avoid chipping.

A third kind of moulding is gilt. This usually has a fine, smooth finish and

gives a different effect from those frames in which gold paint is applied after the frame has been put together. All picture mouldings have one point in common in that they have a rebate at the back in which to accommodate the picture and glass.

Other materials include cheap thin wood backing. Practically any thin wood can be used. Plywood is excellent for the purpose



A good quality glass should be used, one of a good clear transparency, which will not give the picture a distorted appearance due to inequalities in thickness. Some brown paper to back the whole, screw eyes to hold the cord, and a few picture sprigs are the only other requirements.

As the picture has to fit in the rebate of the moulding, the size of the frame must be based on the rebate size. Fig. 1 is a section through a picture moulding and shows the rebate clearly. As a practical example, assume that a picture measuring 10 in. by 7 in. has to be framed. Whilst the rebate size is all important it is necessary to ascertain the overall size because, when the moulding is placed on the mitre block, the back edge touches the kerf in the block. This back edge necessarily represents the overall size.

Fig. 2 shows how the calculation is made. The moulding should be measured on the under side from the rebate to the back edge, not the complete width. In this case it measures 1 in. Consequently, the overall length is 10 in. (the picture length) plus 1 in. at each end (the moulding), giving a total measurement of 12 in. To this it is advisable to add, say, $\frac{1}{8}$ in. to allow clearance for the picture. Similarly, the height becomes 9 in. full. The rebate causes a margin of the picture to be hidden all round. If this is to be avoided the picture must be stuck on to a slightly larger sheet of paper so that only the projecting part of the paper is hidden.

Cutting the Mitres. Place a piece of moulding on the mitre block and, holding it firmly against the back, cut one mitre as shown in Fig. 3. Notice that back of the moulding touches the kerfs in the mitre block, not the rebate side. The reason for this is that the saw is not so liable to split out the grain as would be the case if the

moulding were reversed. If cut carefully no trimming is necessary.

From the point of the mitre mark the overall length along the back of the moulding. Place it again on the mitre block with the mark slightly to one side of the kerf in the block. In this way the mark is just left in when the second mitre is cut. If this were not done the frame would be a trifle under size.

Proceed similarly with the opposite side, but take the length from the piece already cut, this is because the opposite pieces must be exactly the same length. When the two remaining sides have been cut the four pieces can be tried together on a flat board. Some workers prefer to trim the mitres on a mitre shooting board, but this should not be necessary if the work has been done carefully.

Assembling the Frame. There are various ways of doing this. Those who have a mitre cramp will find this a great advantage. The mitres of two adjacent pieces are glued and placed quickly in the cramp. When the

members of the moulding coincide exactly the tightening screws are turned and two nails are driven in, one in each direction. Fig. 4 shows the procedure. In the case of extra tough wood it is a good plan to first drill fine holes.

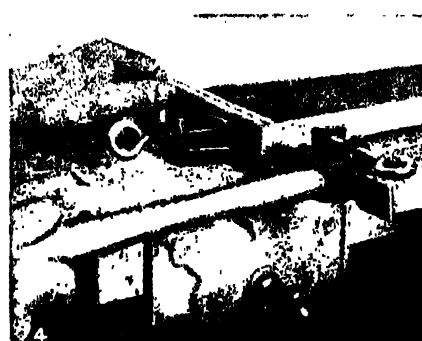
Next the two opposite pieces are put together in the same way, so that the work at this stage is in the form of two letters L. The moulding can be taken out of the cramp immediately after the

nails have been driven in and punched home. It is now merely a matter of joining together the two parts, and this is done in exactly the same way.

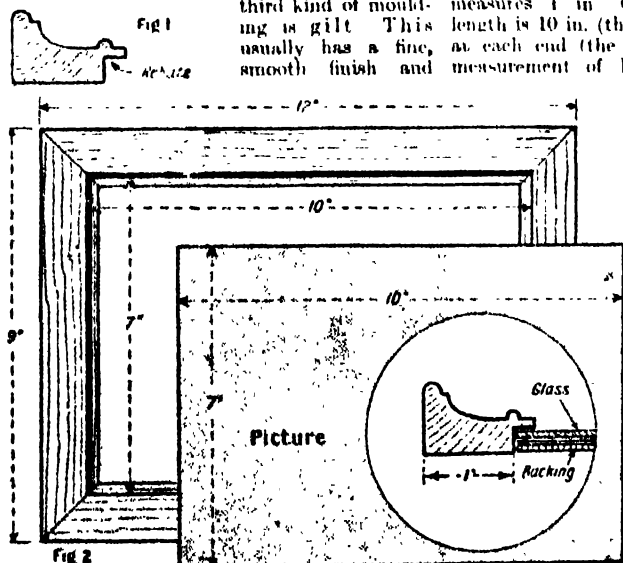
If a mitre cramp is not available the bench vice can be used to hold the one piece whilst the nails are being knocked in. In this case it is essential to drill a hole in the upper piece and drive in a nail so that it just projects at the mitre. Otherwise the blows of the hammer simply cause the upper piece to slip down. In any case a small amount of slipping is to be expected, and for this reason it is necessary to place the upper piece a trifle high, as shown in Fig. 5. The hammering soon brings it to the correct position. Fig. 6 shows the work in the vice.

A point always to be remembered is that nearly all picture mouldings are thinner towards the rebate. Consequently the nails must be so placed that they go into solid wood. Nothing looks worse than for a nail to emerge at the surface of the moulding. If this should happen the nail should be tapped back and withdrawn, and another nail driven into a more solid part of the moulding.

When assembling the mitres in the vice the left hand should always hold the upper piece



Picture Framing. Fig. 3. Cutting mitre, using mitre block. Fig. 4. Nailing mitre in cramp.



Picture Framing. Fig. 1. Section through moulding, showing rebate. Fig. 2. How overall size of frame is ascertained.

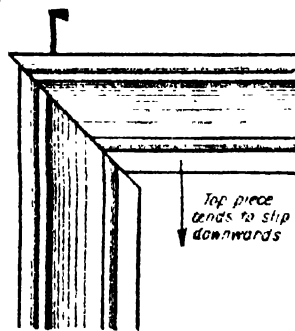
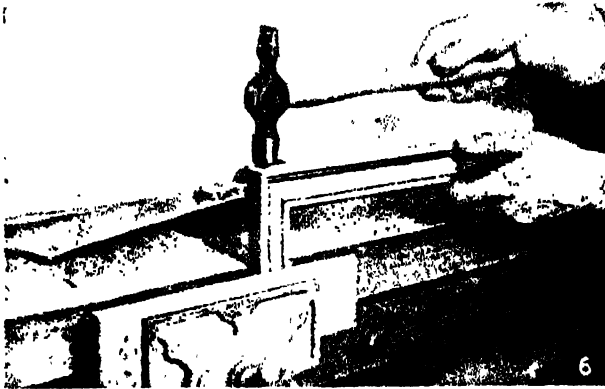
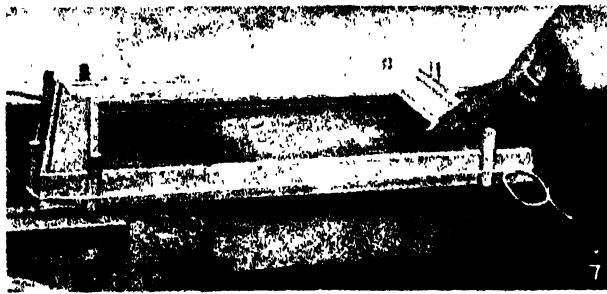


Fig. 5. Upper piece of moulding is placed slightly high to counteract downward slip.

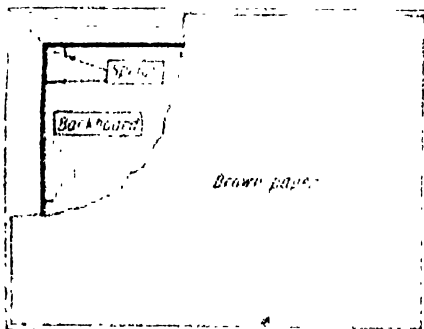
of moulding, partly to steady it and partly to prevent it from turning on the nail. It may be found after all four sides have been put together that the frame "winds" slightly, that is, the four pieces are not in a true plane. This is easily ascertained by laying the frame on a flat board. If it is not true



Picture Frame. Fig. 6. Putting miter together in bench vice. Fig. 7. Assembling frame with string and wedges.

the two diagonally opposite corners will stand up a trifle. This is easily corrected by placing the frame face downwards and tamping the corners lightly with the hammer. Care being taken not to break the joints.

A third method of putting together a frame is shown in Fig. 7. It has the advantage that no nails are driven in until after the glue has set. There is thus no danger of the joints



Picture Frame. Fig. 8. Back of picture, showing picture springs and paper backing.

shipping. All the mitres are glued and the four parts are laid in position on a flat board. To squeeze out any surplus glue the parts of each miter should be rubbed together. A piece of strong string is then tied around the whole, thus binding the sides together. To force the joints tightly together eight small pieces of wood are cut out, and two are passed between the string and the moulding at each side near the centre. By sliding the pieces towards the corners the string is tightened. At least twelve hours must elapse before the string can be taken off and the nails driven in.

No matter which method of assembling is adopted, it is important that any surplus glue is cleaned off before it hardens. It is difficult to remove hard glue cleanly, and it looks most unsightly in a joint. If the glue is used carefully and sparingly it will not be squeezed out on the surface of the moulding. If it should ooz out it can be wiped off with a swab dampened with hot water.

Putting in the Glass. If the worker has a glass cutter he can easily cut his own glass.

Probably the majority, however, will prefer to take the frame to a glazier, who will cut a piece of glass to size. After the glass has been thoroughly cleaned and polished it should be laid in the rebate, care being taken not to finger-mark the inner side. The picture is laid over this and a piece of backing prepared. If thin wool is not available a piece of stout cardboard can be substituted. It should be of such a thickness that the back is level with the back of the frame.

To hold it in position a few picture springs are driven in all round as shown in Fig. 8. These are headless and can be tapped down so that they scarcely project. A piece of brown paper is pasted down over the whole. This gives a neat finish and excludes all dust. Small screw eyes can be put in at the sides to hold the cord.

To hide the nail holes plastic wood or wax should be pressed in. If the latter is used it should be heated and dropped in from a pointed match stick. When it has cooled it can be levelled down with glass paper. If the frame is to be stained or painted this should be done before the glass and picture are inserted.

PICTURE RAIL. As a rule the wooden moulding or rail incorporated into a wall surface to support pictures and other ornaments should be at a height equal to the architect's on the door, but space may require this to be raised or lowered. Several typical sections are illustrated.

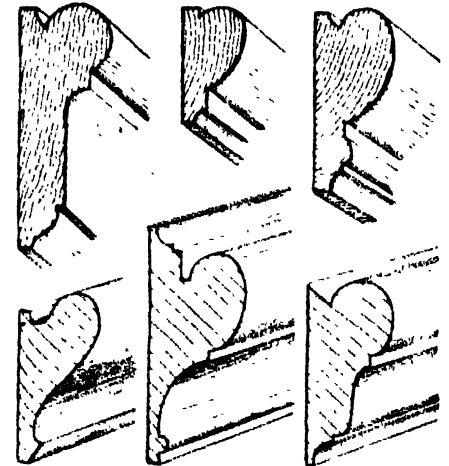
In new work the picture rails are generally fixed to rough grounds embedded in the plaster, oval heads being used which are punched below the surface, the holes being made good with putty or hard stopping. In a room devoid of a rail the picture rail may be fixed by the use of wall plugs and screws, the holes for the latter being carefully stopped.

Occasionally the picture rail may have to be cut and removed to permit a wardrobe or other article of furniture to stand flat against the wall. This is accomplished by sawing the moulding across with a fine toothed tenon saw, placing a piece of cord above and below the moulding so that the saw will not damage the plaster. To repair such a moulding will require a new piece of the same section, which is cut to fit between the existing ends of the picture rail and painted or stained to match the existing work.

Metal picture hangers are used which are curved in such a way that they fit securely over the edge of the moulding, thus doing away with the necessity for nails, and allowing the position of the pictures to be changed at will, without any disfigurement of the walls.

PIE. In some parts of the country the words pie and tart are interchangeable, but usually there is a distinction between them, a tart being open and baked in a shallow tin, while a pie, with few exceptions, is deeper and has a covering of pastry. See Apple Pie, Fish, Game, Pastry, etc.

PIECRUST: On Furniture. In furniture design this term is used for a certain kind of edging sometimes found on small tables. It is waved or scalloped and is raised above the flat centre, because the latter has



Picture Rail. Fig. 1. Typical examples of simple picture rail mouldings shown in section.

been worked down with the tool. It is chiefly seen on mahogany tables of the time of Chippendale style.

PIER: In Building. As used in domestic building construction a pier is a stone or brick pillar, or a projection built out from the face of a wall to strengthen it or to carry any excess of local weight. A small portable building is often arranged to rest on a number of low brick piers. Timber plates are



Picture Rail. Fig. 2. Method of fixing a rail to rough grounds embedded in the plaster.

supported by the piers, and the floor of the building rests on these plates (see Garage). The piers will be proportioned to the size and weight of the building, but for most erections in connexion with the home the piers will suffice if built in 9 in. brickwork.

The first step is to excavate the soil until a sufficiently firm bottom is reached, a bed of concrete about 18 in. square and 6 in. to 9 in. thick should be laid at the bottom and as soon as the concrete is set the brick piers can be erected upon it. The simplest plan is

to build the four corner piers first and then level them, if necessary laying one or two courses of tiles, but getting the heights uniform. The intermediate piers may then be built, levelling them by stretching a line tightly between the corner piers and resting upon the tops. The remaining piers can then be built up, and the line will serve to keep them uniform both as regards direction and height. After the mortar has set hard the timbers may be bedded on the top of the piers and the building completed. See Brick; House.

PIERCING IN METAL WORK

Directions About a Graceful Form of Ornamentation

This contradiction is one of the things to be avoided in the decorative working of metals. See also Metal Work; Napkin Ring; Repousse.

For the home craftsman, pierced metal work offers a very attractive occupation, and many of the articles which the amateur metal worker produces can be ornamented by piercing. It does not cost a great deal for the apparatus, neither does it require a work bench the only real essentials being a good, firm table and a steady light. The tools are few and inexpensive, the most important being a metal

carbon paper and is transferred to the metal by going over it with a blunt pencil.

The next step is to cut the outside of the metal to shape, doing this with a pair of snips or sawing it with the piercing saw if the outline is at all intricate. A pair of cutting snips with bent jaws would be a useful addition to the tool kit, and is employed for cutting curved outlines. A small hole

must be made through the metal just inside one of the lines that define the outline of one of the larger holes. This may be done either with a small drill in a hand drilling machine, or in the case of thin materials with an awl. The rough edges of the metal on the under side of the hole should be filed flat with the end of a small

with a countersink, as there is a risk of a on the surface of the spoiling the cut or

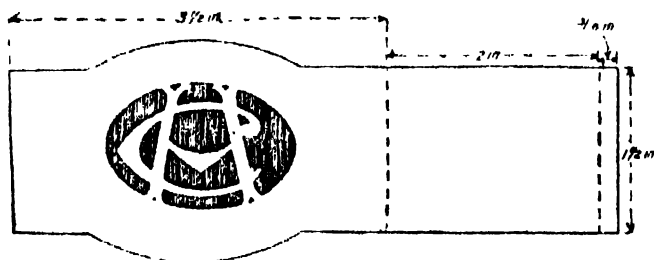
end of the frame against the edge of the table, thus causing the frame to spring a little, keep the frame in this position and fix the blade into the lower clamp and screw the thumb nut tightly. The spring of the frame will tighten the blade, and further pressure can be brought on it by tightening the thumb nut at the end of the frame, thus drawing the clamp and the saw very tight. When the saw is twanged like a harp string, it should give out a decided musical note. It is very important that the blade be tight, or it will not cut properly and will speedily break.

On internal work the saw has to be passed through the hole in the metal as shown in Fig. 3 when it can be tightened as described, although some workers prefer to fasten and untasten the top clamp, as then the work can rest on the left hand while the right is employed in clamping the blade.

The next stage in the work is to fasten the saw table to the work bench with screws or with the clamp, and rest the work on the top of the saw table with the part to be pierced over the hole therein, and with the edge of the part to be cut as near to the sides of the table as is possible. Then with the left hand hold the metal firmly to the table, and with the right commence the sawing.

The whole of the cutting is done on the down stroke, and on the up stroke the saw blade should pass as easily through the work as possible. Keep the saw perfectly upright, as in Fig. 4, and make about 2 strokes per second. Maintain this rate of progress and continue the cutting steadily with an even pressure throughout the whole of the time the blade is at work. When the blade is working on a straight line there is not so much risk of it breaking, when cutting curved parts the blade must be kept going steadily all the while, as if it is twisted in the hole it will be almost certain to break. Should the blade show the slightest tendency to stick it can be lubricated with a little oil or tallow.

When the first hole has been cut the others can be dealt with in the same way. The



Piercing. Fig. 1. Design for pierced metal napkin ring and dimensions of the piece of metal necessary for the work.

piercing saw, a work table known as a sawing table and a clamp to affix it to the table.

The table can be made from a piece of 1 in. deal with a V-shaped piece cut from the front part. This open portion is to allow the saw to move while the jaws or side pieces support the metal. The width and shape of the opening can be modified to suit the work in hand. The material used for pierced metal work is thin sheet metal, either brass, copper, zinc, or pewter, and generally No. 24 gauge. The thickest metal that can be cut by hand is about No. 16 in copper or brass.

As a task for the beginner the napkin ring shown in Fig. 2 can be cut in copper, brass, or pewter, about No. 20 gauge in thickness. It is a D-shaped ring ornamented with a monogram.

The expanded design is given in Fig. 1, the leading dimensions being indicated. In cutting the desired monogram it is essential that the left side be

file or cleared away unless this is done projection catching sawing table and breaking the saw blade. It will save trouble to make all the holes at the start so that the sawing can continue without interruption.

The piercing-saw is clearly shown in Fig. 4. The saw clamp nearest the handle is fixed to the latter, and the one at the end of the frame is free to slide in and out of a square hole in the frame. This clamp is adjustable by means of a ball thumb nut; its purpose is to tighten the blade when it has been fixed in the clamps.

The effective length of the frame can be altered by sliding the back of the frame in or out after loosening the locking screw. To fix a saw blade in the frame, first see that the teeth are pointing downward, that is, towards the wooden handle. For exterior work, fasten the saw into the top clamp, then press the

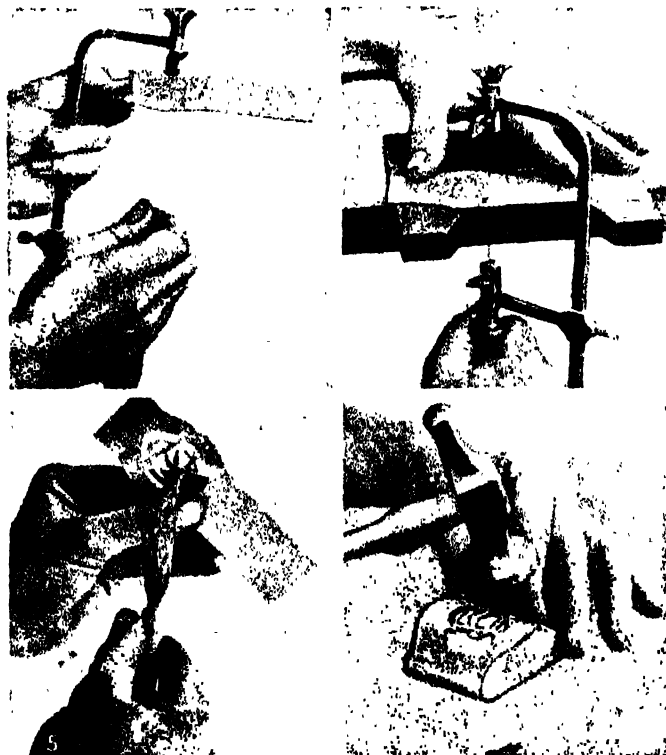


Fig. 3. Threading the saw for internal work. Fig. 4. How the saw and work table are used. Fig. 5. Filing the edges true with a jeweller's needle file. Fig. 6. Shaping the ring on a wooden block, after which the joint is brazed or silver soldered, and the ring finished by polishing, plating, or lacquering.



Fig. 2. Napkin ring, the making of which is described here.

formed by removing the metal around them, and that they have sufficient support from the framework. The articles on Initial, Lettering, and Monogram will form a guide in making the design.

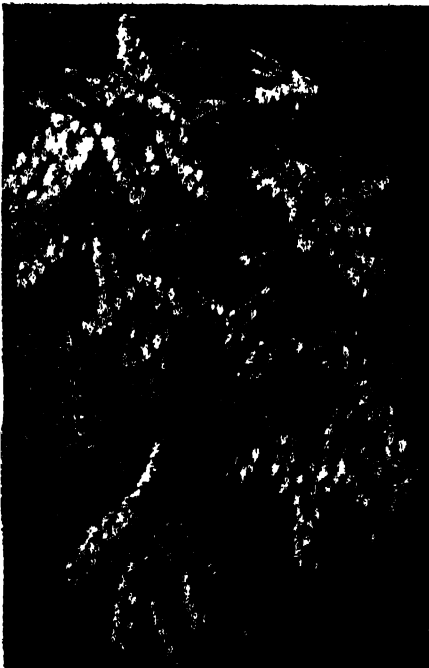
A full-size design should be prepared on thin paper, and the sheet of metal is cut with a pair of tinman's snips to a rectangular shape with overall dimensions a little larger than the design. The metal is then flattened and cleaned up on the surface with fine emery paper. The design is placed over a piece of

saws are made in various grades, or numbers of teeth to the inch, and as a general guide it can be taken that the harder the metal the greater the number of teeth per inch will be needed.

After the pattern has been cut out in this way, the edges may be a little rough, and it will be advisable to clean them up with fine files. The work can be held in the hand, as in Fig. 5, or the metal can be grasped in the vice between two pieces of board. When filing, watch the progress carefully, as a few careless strokes with a file will destroy the appearance of the whole design. The metal is fashioned to the desired curvature by bending it over a shaped wooden block with the hands, finishing by gentle hammering with a repoussé or other flat-faced hammer as in Fig. 6. The joint is afterwards brazed or silver soldered, and the work is then cleaned up. Finally it is polished, lacquered, or plated, whichever is found to be most suitable to it.

PIER GLASS. Strictly speaking a pier glass is a mirror of such shape and size that it can be fixed between two windows, the name being due to the fact that the word pier in one of its senses means the wall space between two openings. Pier glasses were seen in the great houses of the 18th century, and often pier tables were made to match them. Their principal features were their size and the richness and elaboration of their carving and gilding. The phrase, however, is now used somewhat loosely for a looking-glass suitable for the dining room, drawing room, or one of the other reception rooms of the house. See *Cheval Glass*; *Dressing Table*; *Mirror*.

PIERIS. This is an evergreen flowering shrub belonging to the heather family. It bears panicles of white blooms in the spring



Pieris, a hardy evergreen shrub with heather-like flowers in spring and early summer

and early summer months. It likes peaty soil, but will flourish in loamy soil which is free from lime. Planting should be done in September or in April-May. The hardiest kinds are *floribunda* and *japonica*, which grow 3-4 ft. high and flower in April-May. A more vigorous and less hardy kind is *Pieris formosa*, which is chiefly suitable for planting in mild districts. Little pruning is needed, but the shrubs should be clipped lightly when the period of flowering is over. Propagation is by seeds and layers.

PIER TABLE.

This is one of the several forms of the occasional or side table. The name was first given to a table designed to stand against a wall between windows, the reason being that the wall space there is sometimes called a pier. Seen in the more affluent houses of the 18th century many of them had marble tops and were designed in the Louis style, although they were also made by the great English cabinet makers. Some of them were made to match the pier glass beneath which they were placed. To-day



Pier Table. Antique example veneered with saunwood and other woods. English, about 1770-80

By special permission of the Director, Victoria and Albert Museum, S. Kensington

furniture it is sometimes called Roman Mosaic, but should be distinguished from mosaic proper, which is embedded in cement.

a pier table is a light table, the marble top having given way to a wooden one, made to stand at the side of a room. Its usual form is a reproduction of the antique example illustrated. See Table.

PIETRA-DURA.

This is a form of Italian inlaid work in which marbles, agates, or other hard stones are inlaid in wood or marble and known as pietra dura. Used in the decoration of

PIGS AND PIGKEEPING

The Feeding and Housing of These Profitable Animals

Country readers, in addition to this contribution, may consult with advantage such articles as *Duck*; *Goat*; *Poultry*. See also *Bacon*; *Ham*; *Pork*.

It is essential that before embarking upon pigkeeping, persons should make themselves acquainted with the appropriate regulations of the local sanitary authority. Also, the intending pigkeeper should be in possession of full details of the rationing of pig-foods.

Making a Start. When these matters have been satisfactorily settled, the next point to consider is the type of pig that should be kept. Before making a choice, the pigkeeper should decide whether he intends to breed from it or to keep it as a store or a fat pig; in the latter event he should decide whether he intends to convert it into pork or bacon. Whichever his intention may be, he is advised to select the breed or type of pig that is most popular in his district for the purpose for which he requires it. Whatever breed or cross is selected, it is advisable to choose the offspring of a well-bred dam of good conformation. It is also important that the sire should be pure-bred and that the sire and dam should not be too closely related.

It is advisable to start pig keeping with a newly weaned pig, about eight weeks old, care being taken to secure as good a specimen as possible. An extra shilling or two spent on a good pig will be amply repaid. At the same time, the buyer should not devote too much attention to fancy points. Above all, he must have an animal with a vigorous constitution; a greedy, lusty fellow, active on his legs, lengthy and round in shape, with a clean and pliable skin, covered with a fine coat of soft, glossy hair.

Feeding the Pig. For several weeks after weaning the pig should receive its food in a moderately sloppy condition, slightly warm if the weather is cold. The food should be easily digestible and may consist of potatoes, turnips, and other vegetables, together with table scraps and grease from the kitchen and a little middlings or sharps. The roots and vegetable matter should be boiled together and afterwards well mashed and mixed, the meal being incorporated at the

same time. Water should be added, or preferably a little skim milk, to give the whole the consistency of gruel. A newly weaned pig will usually require about 2 lb. of food per day, irrespective of added water and, in the absence of milk, half the food should consist of middlings or similar material.

The young pig should be fed regularly three times a day, the amount of food being gradually increased. Caution is necessary in the use of kitchen waste, as such material frequently contains salt and soda in such quantities as to be highly prejudicial to young pigs. Dried blood, meat meal, fish meal, and hulled cake meal, all have a high content of easily digestible flesh-forming material and are, therefore, suitable for feeding to young pigs a little at a time only being given.

As the pig is naturally a grazing animal it is important that succulent vegetable food should form part of its food at all seasons of the year. The importance of feeding green fodders to young growing animals has been emphasized by research, which has shown that substances necessary to normal rapid growth absent in the feeding stuffs generally given to stunted pigs, are present in green fodders. In the summer succulent green food is generally plentiful enough.

Young grass from the wayside weeds from the garden, and similar material will all be picked over by a young, growing pig to its advantage. Tender young clover and lucerne are excellent green foods for pigs. Lucerne especially is valuable in that it is available early and late in the year, several cuts being obtainable annually. A small patch of ground



Pig, Berkshire pig, a profitable breed, producing fine hams



POULTRY : A SELECTION OF THE MOST POPULAR AND PROFITABLE BREEDS

1. Silver-spangled Hamburg 2. Black Leghorn 3. Ancona 4 and 5. Spangled Old English Game Bantams 6. Bulldog Plymouth Rock 7. Single-comb Rhode Island Red 8. Silver Sebright Bantam 9. Silver Campine 10. Houdans 11 and 12. Black Red Modern Game Bantams 13. Black Sumatra Game 14 and 18. Brown Leghorns 15. Black Minorca 16. Australorp 17. Light Brahma 19. Croad Langshan See page 993



Girls on a Bridge, by Utamaro



Two Girls, by Shigemasa



A Girl and Her Reflection, by Utamaro



The Bridge of Boats at Sano, by Hokusai



Maple Leaves on Tatsuta River, by Hokusai



Trving on Clothes, by Komasai



Girl Painting, by Utamaro



The Cool of the Evening, by Kiyonaga

PRINTS, THE JAPANESE ARTIST AT HIS BEST

One class of prints is illustrated here. A general account of the subject with hints for the collector is given in p. 1001
 (page p. 941)



Sow of the Middle White breed, a prolific variety that matures early

could well be spared for this highly nutritious forage plant. Rape, vetches, and rye supply highly nutritious green food at times when such material is scarce. For the supply of the necessary succulent food in the dead of winter recourse must be had to potatoes, turnips, mangolds, sugar beet, artichokes, parsnips, etc. Of these, potatoes and sugar beet are the most valuable 4 lb of each being considered equivalent to 1 lb. of cereal meal.

For the first month or two the pig should be allowed a moderate amount of exercise. An occasional run outside its sty will tend to promote a healthy appetite and will also encourage growth. When the pig reaches about 100 lb in live weight this should be curtailed, and feeding should be rather more forced. Wheat offals, accompanied by a little rice meal, maize meal, or barley meal, may be given more freely, and the supply of the more bulky vegetable food should be reduced.

The pigkeeper should note that the method of feeding pigs is most important, if the best quality meat is to be obtained. In a good carcass the flesh should be solid, of uniform consistency, and fine texture, evenly streaked with fat and lean, of a bright fresh colour, and not watery. The fat should be firm and white and remain hard at ordinary temperatures, while a thin, smooth and mellow skin is desirable.

To obtain the above qualities a proper food ration is necessary: anyone situated near milk, butter and cheese factories, who can obtain waste by products and use them with has the ideal ration for producing good quality pork and bacon. An unbalanced ration consisting chiefly of oily foods, with maize and rice meal produces dark coarse flesh and soft spongy fat. A suitable carcass for the fresh pork trade has the following characteristics:

Head light and medium size. Shoulders light and fine. Back, firm and level; ribs well sprung. Belly, straight underline, nicely lined with flair. Hams, plump, deep and well let down. Flank thick and streaky. Bone, fine.

The Ministry of Agriculture give the following conformation which the Wiltshire bacon trade requires:

Back, long and level, with ribs well sprung. Sides, level and moderately deep. Hams broad and deep to hock, tall set high. Belly and flank, thick with straight underline. Shoulders, light and on a line with forelegs below and with sides laterally; free from wrinkles and coarseness. Flank, aligned with the sides. Head, neck and jaw light. Legs, short and set apart, the pig should stand well up on the tips of the toes. Bone, fine skin, free from coarseness and wrinkles. Hair, fine.

The pork section of the National Federation of Meat Traders' Associations states, in summarising points to be borne in mind by pig breeders, that "Large and middle white and Welsh breeds, or pigs produced by crossing large black or Berkshire sows with these breeds, are suitable for the pork market. The boar should not be black, as the trade strongly

objects to black porkers."

If carefully fed from the start a pig should weigh from 170 lb to 180 lb live weight when about 5 or 6 months old. It is then ready for killing. The dressed carcass should then weigh from 130 lb to 140 lb. The amount of food required at this stage will be from 5 lb. to 6 lb of meals or their equivalent each day. If kept alive beyond this stage the rate of increase gradually slackens, while the amount of food necessary to produce each additional lb of pig becomes greater. Fat bacon and fat pork, however, are more useful as food than are their lean equivalents, especially in winter, and the person who only fattens one pig for his own use will be well advised to keep this factor in mind. He may prefer to feed his pigs to a heavier weight than 180 lb.

In the absence of straw, dried bracken, grass and leaves make a thoroughly satisfactory bedding for pigs. Every effort should be made to provide an abundant supply, especially in cold weather, when the pig prefers to curl up in bed and is content with the minimum of exercise. When it is remembered that food is more expensive in winter than in summer, and that it takes more food in winter to produce a lb of pork, the supreme importance of comfort during the coldest season of the year is apparent.

Building a Piggery. The main essentials of a piggery are comfortable and clean conditions. A dry bed, combined with suitable ventilation and the absence of draughts

promotes the general health of the animals, prevents chills and rheumatism, and minimizes the risk of disease.

The foundation must be dry and, if conditions permit, it should face south. Access to a small paddock is a distinct advantage. Openings in the wall and roof, through which the passage of air can be easily regulated, should be provided in order that the temperature may be kept as even as possible throughout the year. A close, stuffy atmosphere destroys the appetite and is as harmful as a cold sty. Provision for suitable lighting may be made either in the walls or in the roof.

A simple type of sty is illustrated in Fig. 1, which indicates the general arrangement of the structure. The total area occupied by the double structure is 15 ft. by 18 ft. The covered portion is 6 ft. from front to back leaving an open space of 9 sq. ft. for each enclosure. Details of the outer walls and door as well as the brick floor to the pen are shown in Fig. 2. Such an erection provides accommodation for two sows and their litter. In this case the sty is located in the angle of a wall and the roof plate rests on the wall of the adjoining building. The same lines of treatment may be followed if the pigkeeper prefers to build an independent structure, when, of course, four walls will be needed.

The first step in construction is to mark out the ground with pegs and lines and excavate the top soil, digging a shallow trench, which is filled in with concrete and the top surface levelled off. The whole surface should be covered with concrete at least 9 in. thick. A fall is preferably arranged to the front of the pen and an outlet provided to any convenient drain.

In its absence a sump should be built and drain pipes taken to a cesspool, or some other sanitary arrangements made for dealing with the liquid manure. When the concrete has set sufficiently, the walls may be put up, preferably in 9 in. work, but in the case of small pens it may be possible to utilize 4 in. brick thickness, that is, walls only 4 in. thick,



Fig. 2. Pigsty shown below, giving details of door, brick floor, surrounding wall, etc.



Piggery, Fig. 1. An easily constructed piggery in brickwork with a felt-covered timber roof. It is situated in the angle formed by two walls, and will provide accommodation for two sows and their litters.

using strong cement mortar made of 1 part Portland cement and 2 parts sand. The brickwork should be continued to plate height and the roof furnished with stout rafters or other roofing material.

The floor should be floated off with at least 1 in. thickness of strong cement mortar, unless it is finished with regulation stable tiles. The surface should be brushed over with a stiff-bristled broom as soon as the cement is steady or partly set, to roughen it, so that the pigs can maintain a sure footing on it. A stout wooden rail raised on posts 9 in. high and 9 in. from the wall will prevent the sow crushing the young ones when she lies down. The walls are rendered with cement and finished with limewash as desired. A strong door of substantial pattern must be provided for at some part of the pen, and is needed for the covered part or house as well. Provision should be made for light and air in the way of small windows, which can be merely openings, or else they may be partially closed with wood shutters or with perforated metal. Pigs must not be kept in such a manner that they constitute a nuisance, and in most places there are by laws which must be complied with by those who keep them.

Cooking Hints. When pickled, dried and cured, pig's cheek is known as bath chap, but it is also sold simply pickled. Bath chap needs to be soaked before being cooked, but pickled cheek usually requires a thorough washing. Both are cooked in the same way.

Pig's Feet. There are various ways of cooking pig's feet, but broiling and frying are perhaps the best. To do this, wash two feet thoroughly, scraping the skin with a knife, then cut them in two and let them soak for about an hour in salted water. Wash them again in fresh water, tie them together and put them into a pan containing 1 pint water and 1 gill vinegar which have been previously heated over the fire.

Boil up the whole, and after removing the scum from the top put in a small onion, a bunch of herbs, and salt to taste. Cover the pan and cook its contents very slowly until they are tender, then take out the feet, bone them and season them to taste. They can be eaten hot or cold. If they are to be fried, spread a little pork sausage meat over the cut sides of the flesh, and fit the pieces together again to form their original shape. Roll them lightly in flour, coat them with egg and bread crumbs, and fry them in a pan of hot fat.

To broil, cook and bone them, brush them over with melted butter, coat with bread crumbs, and cook over a clear fire. Apple sauce (q.v.) makes a good accompaniment.

Pig's Head. The most usual method of cooking this is to steep it in a salt pickle comprising 1 lb salt and 14 oz saltpetre and then to boil it, and serve it hot with cabbage or beans; or to boil it in a cloth, press it between two weights, and serve cold.

For pickling, scald the head in boiling water for a few minutes, scraping off the hairs with a knife, then cut it open and remove the brains, eyes, and snout. Wash it thoroughly, leave it overnight in a pan of strongly salted water, and then rinse it in fresh water. Rub it all over with the salt mixture and leave it thus for about 6 days, turning and basting it daily. Before boiling, wash the head again to remove the surplus brine, then put it into a pan containing just enough water to cover it. Boil this up, removing any scum from the top, and then cook the head slowly until it is tender. Serve it garnished with the cooked tongue, skinned and neatly sliced.

To prepare the cold dish boil up a salted pig's head in a pan containing sufficient warm water to cover it, take the scum from the top, and then let the whole simmer for about 2 hours. When tender, take it out of the pan to cool, skin and slice the tongue, and split the

head in two, removing the bones. Season it to taste, and on one half of the head place the slices of tongue, putting the other half on top to form a sandwich. Tie the whole in a pudding cloth, cook it again for the same length of time as before, and then press it between two weights, leaving it to get cold. It should then be served thinly sliced.

PIGEON. Anyone wishing to keep pigeons should think carefully before securing stock. The climate and the available accommodation must be considered. If one is living in a town many of the most beautiful and picturesque pigeons cannot be kept. Birds such as Fan-tails, Jacobins, Trumpeters, Fairy Swallows, Muffed-legged Tumblers are sorry looking objects when they are forced to live in the atmosphere of an industrial district like Manchester or Leeds, but in the open country they will do well.

Birds of delicate coloured plumage and markings are also unsuitable for town life. Dragons, Antwerps, Snow Homers, Carriers, Sandaracorns, and English Owls thrive best in the country. Of those which thrive in almost any climate may be mentioned Arch-angels, Tinklers, Flying Homers, Magpies, Nuns, Short and Long-faced Tumblers, Barbets, Turbits, African Owls, Pouters, Pouter Pouters, Norwich and Holle Croppers, Brummers, Swifts and Moderns. The best breeds for a beginner to choose from are the short, hard-feathered bird, such as Archangels, Long-faced Tumblers, Exhibition Flying Homers, Magpies, Nuns and Moderns.

Before deciding upon any particular breed the novice should visit one of the shows which are held in all parts of the country from September till February and select one which is the best adapted to the environment in which the birds will have to be kept.

Feeding the Birds. As to food, maple peas, rarer, darr and wheat in equal proportions make good feeding for the smaller breeds. The larger ones may be given beans, and small maize in addition. Green food in the form of lettuce, cabbage, or some of the succulent

weeds found in the garden, chopped up fine and given in a bowl twice or thrice a week will be much appreciated. A handful of mixed small seeds and rice may be given as a tit-bit once a week.

The breeding season extends from February till July. It is unwise to prolong it, as it interferes with the proper casting of the feathers in the moulting season. Unless a bird moults freely its health will be impaired.

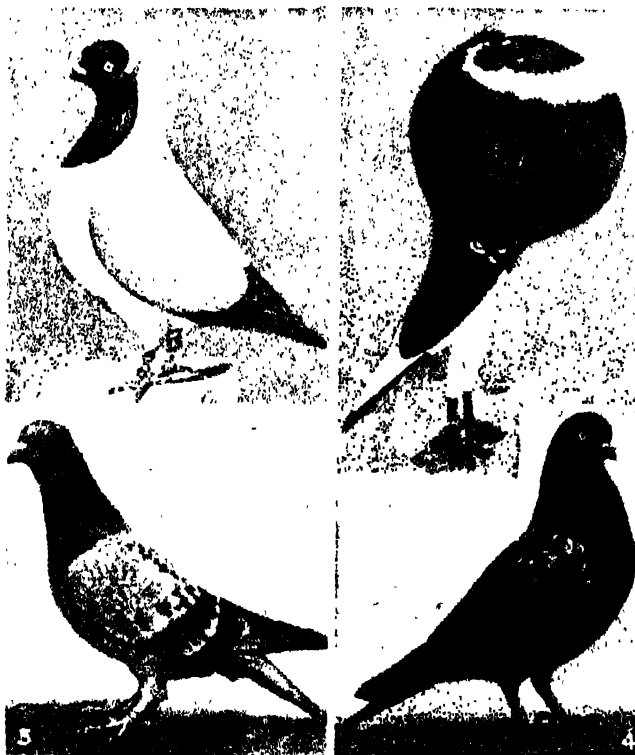
Young pigeons are cared for by their parents for the first month. After that the old birds leave them to themselves, and set about raising another family. A hen pigeon when she goes to nest lays her first egg at night, and the second about noon on the second day after. The period of incubation is 18 days.

The Pigeon House. Before purchasing any birds a house in which to keep them is needed. The papers devoted to pigeons contain advertisements of many such. The majority of pigeon keepers use home-made erections, chiefly because they can adapt the house to its surroundings. The best form of building for the purpose is a strongly made wooden shed built of 1 in. tongued and grooved boards. The roof should be covered, on top of the boards, with either galvanized iron sheets or asphalt felt. The outside walls may be covered with either tar or paint. The former is more lasting, the latter more pleasing to the eye. Dark-green paint with the window and door frames in white is attractive. The inside should be painted light blue or whitewashed.

Each house should possess a wired aviary or flight, extending the whole width of the front, and about 10 ft. or 12 ft. long. Stout 3 in. wire netting should be used, which it tared every summer will last many years.

If success is to be attained and a race of strong, healthy birds built up they must never be overcrowded. A shed 8 ft. by 6 ft. with a span roof 6 ft. 6 in. at the eaves will give accommodation for eight pairs of the smaller breeds or six of the larger. The floor of the house should be covered to the depth of 3 in. with coarse sawdust, which should be renewed frequently. It will last much longer if the droppings are removed from the top every week. The floor of the aviary should be dug out to a depth of 2 ft., and filled with broken bricks or blinkers, to within 4 in. of the top. This should be covered with coarse sand, which should be rolled hard, the top swept or scraped every week, and the whole of the sand renewed every six months.

Ordinary bracket perches fixed to the wall will suit any of the breeds recommended to the beginner. Good nest boxes may be made from the ordinary sugar boxes which are sold by grocers. These should be laid on the floor. Glazed earthenware nest pans should be used. The box should contain sawdust to the depth of 1 in., and the nest pan also; short pieces of soft straw 4 to 6 in. long may be given to the birds for nesting material. Large open pans of earthenware or zinc are best for



Pigeons. Four breeds that are general favourites. 1. The nun, an attractive toy pigeon. 2. Norwich cropper, a pouter pigeon. 3. Homer or homing pigeon. 4. Mottled tumbler.

By courtesy of Pigeons and The Pigeon World

baths, and fountains for drinking water. Never let the birds drink the bathing water if it can be avoided. Drinking water should be given fresh daily. The bath water should be renewed twice a week. *See Dove*.

How to Cook. Wild or wood pigeons should always be roasted, but the house pigeon may be served in a variety of ways. When buying these birds, select those with comparatively small eyes, soft red and tender feet, and necks covered with bright, neat looking feathers of much the same colour as those on the rest of the body. The spurs of the male bird should be short and round.

To roast pigeons, pluck, draw and singe them, then wash and truss them. Leave the feet on, but scald and scrape them. Lay a shallot inside each bird, dust with pepper and salt, then tie over the breast aasher of fat bacon. Roast for 20 to 25 min., and baste frequently using clear beef dripping or butter. Just before dishng, dredge the birds with flour, then baste and return to the fire or oven to finish cooking. Bread sauce and a good brown gravy should be served with them, and the stock with which the gravy is made should be flavoured with the giblets. If liked, roast pigeon may be stuffed with pigeon forcemeat.

To broil pigeons, split the birds down the back, spread them open, rub them with butter, season and broil them over a clear fire or under a gas grill. Before dishng, rub them once more with butter, sprinkle over them some chopped parsley and a few grains of cayenne pepper.

Pigeon Forcemeat. A good stuffing for pigeons can be made from the livers of these birds. Parboil 2 of these, chop and mix them with $\frac{1}{2}$ dessertspoonful chopped shallot, 6 dessertspoonfuls breadcrumbs and 2 oz. chopped fat bacon. Season the mixture with pepper and salt and a little grated nutmeg, and bind it with the yolk of an egg and if needed, a little milk.

Pigeon Pie. Take 4 young pigeons and $\frac{1}{2}$ lb. rump steak, 4 oz. prepared and chopped mushrooms, 4 shallots, also peeled and chopped, 1 dessertspoonful chopped parsley, 2 hard-boiled eggs and seasoning. Cut each bird in halves and fry the pieces sharply for 2 or 3 min. to colour them. Cut the steak into slices, roll them and dip them in pepper, salt, and flour. Lay them at the bottom of a pie dish, then sprinkle over half the mushrooms, parsley, and shallot. Arrange the pieces of pigeon over the steak, sprinkle on them the remainder of the mushroom, etc., and season.

The eggs must be cut in quarters and littered in among the portions of pigeon; moisten with $\frac{1}{2}$ pint good stock. Cover with rough puff pastry (*see Pastry*) in the usual way, decorate the centre with pastry leaves, egg the top of the pie, and bake about $\frac{1}{2}$ hours. Before serving, fill up the pie with gravy and replace the pastry ornament with the feet in the opening on the top of the lid. The feet of the birds should be scalded, scraped, blanched and glazed with meat glaze.

Pigeon Ragout. To make this ragout, bone and stuff 4 pigeons with veal stuffing (*see Forcemeat*), but add to this 2 oz. chopped fat bacon and the chopped livers of the birds. Flour the pigeons and fry them a good brown in bacon fat. Then put them into a casserole, cover them with stock, adding 4 oz. prepared mushrooms cut in strips, 1 carrot cut in dice, and a sliced onion. Pour in a wineglassful port and a tablespoonful orange juice. Season to taste, boil up and stew gently about 1 hour. Garnish with croûtes of fried bread or of puff pastry.

Pigeon Soup. Make 2 quarts stock well flavoured with vegetable, and add the giblets of the birds to be used. Truss 4 old pigeons, brown them in a frying-pan, using butter to fry them, and turning them in order to brown

them all over. Drain them from the fat and add them to the stock, which must be ready boiling on the fire. Cook all gently for one hour, then remove them from the soup, skim it free from fat after straining it, and thicken it with brown roux. Serve with diet of fried bread. Fillets cut from the birds may be served in this soup, or the pigeons may be laid aside whole and used up for some made dish. If the soup is too pale, colour it with a little browning.

PIGEON BREAST. The serious deformity of the human chest, in which the ribs are flattened so as to throw forward the breast bone, is known as pigeon breast. It occurs in rickety children who suffer from some bronchial affection, which prevents the free entrance of air into the chest, and is then due to the effect of atmospheric pressure on the softened ribs. *See Rickets*.

PIKE: The Fish. This large fresh-water fish requires careful cleaning and it is apt to retain its muddy flavour.

When the pike does not exceed 4 or 5 lb. in weight it is known as a lace or jack. Large pike are considered better than small ones. The flesh when cooked should look white and firm, but it will improve by keeping for about two days in a cool larder before it is dressed. The roe of the pike should be thrown away. When scaling the fish lay it on a dish in the sink and pour boiling water over it.

To bake a pike whole, choose a fish weighing about 8 lb. Wash, scale, and draw out the gills, trim off the fins, and then wash the fish again before wiping it dry. Fill it with a well seasoned veal stuffing (*see Forcemeat*), and sew it up, then truss it in the shape of an S, score the fish each side in several places, and lay it in a rather deep baking tin. Add not less than 6 oz. margarine or clear beef dripping, 3 peeled and chopped shallots, 2 oz. prepared and chopped mushrooms, 1 small onion stuffed with 4 cloves, a bouquet garni, and $\frac{1}{2}$ pint good stock. Cover the fish with a well greased paper, and bake it for an hour in a good oven, basting frequently.

As soon as it is ready, dish it, removing the trussing strings. Pour off the fat in the pan, all surplus fat, and stir in $\frac{1}{2}$ pint stock. Have ready $\frac{1}{2}$ pint well-flavoured brown sauce, add it to the stock, mix all together, and turn the whole into a stewpan, boiling it till it is reduced to the right consistency. Skim it free from fat or scum, add 1 oz. butter or margarine, a little anchovy essence, the juice of $\frac{1}{2}$ a lemon, 2 wineglasses sherry, and seasoning of cayenne pepper. Strain this sauce over and around the pike.

Cold Pike. Prepare the fish and truss it as in the preceding recipe, and then make the following broth. Fry for 10 min. in $\frac{1}{2}$ gill salad oil 2 onions and a carrot, both prepared and sliced, 2 rashers bacon cut in strips, a bouquet garni, 3 allspice, and 4 cloves, and when the vegetables are ready pour into the pan 2 quarts white stock, add some white wine if liked and 1 dessertspoonful salt. Simmer for an hour, and strain. Boil the fish in this until tender—about $\frac{1}{2}$ hour for an average sized fish. Let it lay in the broth overnight. Then drain it, remove the trussing strings, and dish it. Coat it with mayonnaise sauce. A pike of 9 lb. is sufficient for from 10 to 12 persons. The fish may be reheated in the broth and served hot with tartare sauce. Like all fresh-water fish, pike is better boiled in prepared liquor than in water. The liquor need not be thrown away, as it can be used up for making fish soup or sauces. If kept more than three days boil it up again. *See Fish*.

PIKELET. These are sometimes known as Lancashire girdle cakes. The ingredients are $\frac{1}{2}$ lb. flour, $\frac{1}{2}$ teaspoonful salt, $\frac{1}{2}$ teaspoonful

bicarbonate of soda, 1 teaspoonful cream of tartar, 2 teaspoonfuls castor sugar, one egg, $\frac{1}{2}$ pint water and $\frac{1}{2}$ pint milk. Mix flour and all dry ingredients, beat in yolk of egg, milk and water. Beat well, then fold in the stiffly beaten white of egg. Pour in tablespoonfuls on a hot greased griddle. Cook until brown underneath, then turn with a knife and brown on reverse side. Butter and serve very hot. If left to go cold before using toast them on both sides before a clear fire. *See Girdle*.

PILASTER. This term is used in architecture to describe a form of pillar partly embedded in a wall. It is a feature of many buildings, and examples are also found in shop fronts and as decorative features of chimney pieces and furniture. In panelled rooms symmetry is often attained by the use of a pilaster to balance some other feature, the face is panelled or moulded and carved to harmonize with the other decoration. *See Paneling*.

PILCHARD. The small salt water fish known as pilchard somewhat resembles the herring in appearance and taste, but it is more oily and it has a fin in the centre of the back and not near the tail. Pilchards are caught in large quantities off the coast of Cornwall, and are in season from the middle of July till the end of November. They deteriorate rapidly after being caught, and usually are at once salted and kept in barrels or tinned in oil.

Pilchards may be cooked according to most of the methods employed for herrings, and in some parts of Britain they are made into pies. They must be soaked overnight and then placed in a pie dish with alternate layers of leeks and covered with short pastry. Bake about 30-40 min. *See Herring, Pastry*.

PILE: In Textile Fabrics. Velvet and velveteen are cloths with comparatively short pile, whereas plush has a longer pile. Other pile fabrics are in common use, one of them being Turkish toweling, in which the pile consists of loops. The imitation fur fabrics, such as astrakhan, are piled, and so are many carpets. In Genoa velvet, as used in furnishings, there are two heights, and often colours, of pile forming a decorative pattern. Pile fabrics are generally warmer than cloths made without pile. The wear comes not on the sides but on the ends of the fibres, and for this reason properly made pile goods are durable. A beauty, depth, and richness are obtained for carpets, furniture and hangings in velvet piles which cannot be obtained in non-piled materials. Pile surfaces have their disadvantages, for sometimes their surface is a clinging one, and they harbour dust. The pile can be pulled out of new carpets by careless use of carpet-sweepers. The longer the pile in fabrics of any kind the greater is its tendency to become laid. *See Carpet, Velvet*.

PILES. Congested and varicose conditions of the veins at the lower ends of the bowel are the cause of piles. There are two varieties, external and internal, but both may be present.

Anything which produces an obstruction in the circulation of the blood in the abdomen is a predisposing factor. Constipation is one of the most frequent causes. Congestion of the liver acts in the same way, and piles are common in beer and spirit drinkers, and also in those who eat largely, or live a sedentary life. Sitting on the grass, a stone or a cold seat may bring on an attack by chilling.

External piles form dark brown folds of skin running out from the anus. They are soft, but when filled with blood large and hard. Friction and want of cleanliness may cause them to inflame. With internal piles the first symptoms may be a little bleeding. As a rule, they give no pain, but cause

a sensation of fullness in the bowel, and they may cause straining at stool.

Constipation must be prevented. Eat wholesome bread, stewed prunes, apples, and other fruits, and plenty of vegetables. Astringent purgatives of any kind are bad, while aloe is particularly to be avoided. Regular moderate exercise should be taken, the best form being a brisk walk of two miles a day. The sufferer should take great pains to avoid much standing about and cold feet. He should never sit on the ground or on a cold seat. He should take little or no alcohol, strong tea or coffee. Another important rule is to keep the affected parts perfectly clean by washing and sponging. When piles become inflamed the patient should keep his bed and send for the doctor.

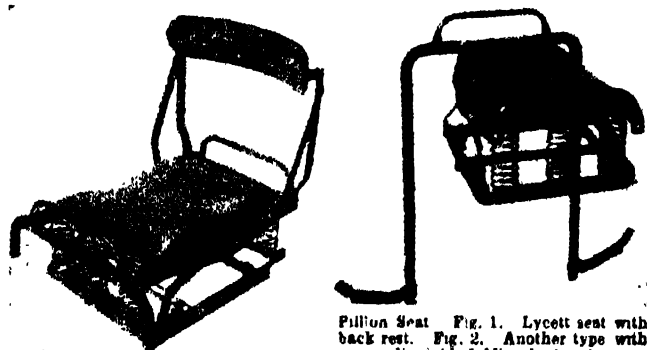
When the acute stage of the inflammation has passed off, the official ointment of gall and opium may be used applied on lint, or witch hazel ointment. When internal piles come down or prolapse at stool, they should be gently pushed back with the fingers. Should bleeding occur thoroughly smear a small plug of cotton wool with witch hazel ointment and gently push it into the bowel.

PILLAR. In architecture a pillar is a rigid upright support capable of standing alone and supporting an object or part of a building. Pillars may be employed for a portico or entrance porch, for a pergola, or as part of the structure of a house. Pillars have a definite decorative value, and the architect employs them in this way as well as to perform some useful purpose. Unlike a column, a pillar does not of necessity conform to any defined rules of proportion or period, but the characteristics of the recognized periods of architecture are generally taken as the basis in preparing a design. See Porch.

PILLAR ROSE. This term is used to distinguish varieties of climbing or rambling roses which are suitable for training on poles or pillars from 6 to 8 ft. in height. For the taller pillars some of the rambling roses are suitable. Minnehaha, Harwatha, Lady Gray, Sanders White, Lady Godiva, Blue Rambler and Dr. Van Fleet. Some of the best climbing roses for pillars 6 ft. or more high are Scarlet Climber, Mme. A. Carriere, Lemon Pillar, Climbing Ophelia, Climbing Lady Hillingdon and Lady Waterlow. See Rose.

PILLION SEAT: On Motor Cycle. This is an auxiliary seat attached to the carrier at the rear of a motor cycle or side car combination. Two types are here illustrated. It is against the law to carry more than one passenger on the pillion seat of a motor cycle, and the person carried must sit astride on a properly secured seat. This law does not apply to a motor cycle with side car. Side saddles may be used only when a motor cycle is attached to a side car.

The holder of a provisional driving license on a side motor bicycle cannot take a pillion passenger anyone who has not either held a driving license for at least two years or passed the driving test. See Motor Cycle.



Pillion Seat. Fig. 1. Lycett seat with back rest. Fig. 2. Another type with adjustable folding foot rests.

PILLOW. The ordinary pillow is made of goose feathers or of down, enclosed in a cover or tick of white fustian, which must be firmly and strongly sewn, so that no feathers can escape. A pillow requires to be unmade, staved, picked over, and remade from time to time, but this need not be done so often if it is sewn into a plain linen underslip, and kept thoroughly well shaken and beaten.

Down pillows are nearly twice as expensive as good feather pillows, but they have the disadvantage that they are very hot, and many people like them to be replaced in summer by feather pillows. The ordinary English pillow is oblong in shape, about 27 in. by 18 in. But the square pillow, which may be as large as 27 in. by 27 in., is most comfortable if it is used with what is known as a wedge bolster. This is like a tiny mattress, about 5 in. deep at the back and sloping down to about 1 in. in front.

Children must have pillows thinly filled, so that the head is only very slightly raised. Low pillows are better for adults, too, and the modern tendency to do away with the bolster is a recognition of this.

Pillow Case. Pillow cases, or, as they are sometimes called, pillow slips, are obtainable in cotton and linen. Linen is much the best, but it not only wears and washes extremely well, but is smoother and cooler, and therefore more comfortable than cotton. The cases vary in size, so that before buying a pillow case the pillow it is to cover should be measured. If a pillow case is too small the pillow will be hard and unyielding; if it is too large the pillow will be untidy.

Frequently the slip is a plain bag, fastened at one end with linen buttons or tapes. It may be decorated with a hemstitched border or a full, or with lace and row of hemstitching. Unless for every pillow for day time use or ornament, embroidery should be absent or kept to the corners of the case only. When making a pillow case, it is best not to fasten the buttons directly to the end, but to make a flap of double material, about 24 in. wide, that will fold down over the end of the other side of the pillow. The buttons are then sewn inside the flap, so that they are invisible when the case is fastened. See Linen, Quilt.

PILLOW LACE. Lace made with many threads on a cushion or pillow is popularly known as pillow lace. This term is somewhat misleading and such handmade lace is more correctly termed bobbin lace, as many needle point laces, in which a single needle and thread are used, are made on pillows. See Lace.

PILOCEREUS.

This is a genus of greenhouse cacti, without leaves, and with fleshy, spry stems. A familiar example is old man cactus. The genus properly is classed under the name cereus. See Cactus.

PILOT CLOTH.

Other colours can be had, but pilot cloths are commonly blue. They are heavy woollens intended

originally for pea-jackets, such as ship pilots wear as a protection from wind and rain.

The cheaper kinds are thick but hard, and in looking at them carefully the blue colour is seen to be cloudy and lighter on the surface of the short nap than in the body of the material.

PIMENTA. This evergreen shrub needs greenhouse treatment as far as Great Britain is concerned. Bearing white and red flowers in early summer, *Pimenta acris* is vigorous and needs a lot of space. It should be pruned in the spring, and propagation is by cuttings.

Pimento Pepper. This is an alternative name for Jamaica pepper, better known as allspice (q.v.).

PIMPERNEL. One of the prettiest of British wild flowers is the scarlet pimpernel (*Anagallis arvensis*), a common weed in gardens. Of others grown for their decorative effect in flower beds and borders the prettiest are *Anagallis linifolia*, of which the varieties Parkson, red and Philippe, blue, are the best. They grow only about 6 in. high and are useful edging plants. Seeds are sown under glass in April and the seedlings are planted out of doors in May. The bog pimpernel (*Anagallis tenella*) is a pretty pink flowered trailing plant suitable for moist places in the rock garden or bog garden.

PIMPLE. Papules, which are small, solid prominences of the skin are popularly called pimples. They vary in shape, and may be pointed, round, or flat on the top. Common examples are the eruptions of chicken pox, acne, and boils in their earliest stages. They should not be rubbed. In many cases a little bone ointment remove pimples, but more energetic treatment may be necessary.

PINCERS.

An indispensable tool in the home is a pair of pincers for pulling out nails and other purpose. The ordinary type has a pair of broad jaws and two handles, one with a knob and the other with a fork or claw end. This is inserted under the head of the nail and used

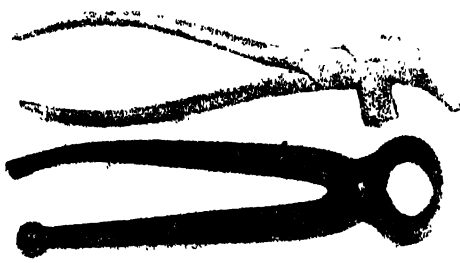
to prize it up sufficiently to enable the jaws to get a firm hold under the head, after which the pincers are closed together and pressed over sideways, thus withdrawing the nail, which may subsequently be pulled out. The cost of a good tool is so little that it is worth while to get a really serviceable and well made pair of pincers.

Shoemakers' pincers have grooved and serrated jaws with an up-standing block formed on one of them. They are employed for pulling leather into shape, and the block is used to get a good pull, being rested against some firm part to obtain a good purchase.

PINCHBECK. From its resemblance to the precious metal, pinchbeck has been popularly termed Brummagem gold. It was to the men and women of the 18th and early 19th centuries what rolled gold and gold filled articles are to those of to-day, with this difference, that the supply was much more limited. Consequently, it has a distinct value to the collector of antique jewelry.

Modern inventions, such as gold-filled products, have superseded pinchbeck in Great Britain, but a variety of it is in use in Switzerland and other continental countries, for cheap jewelry and articles made to imitate gold.

The collector should beware of the modern imitations of old pinchbeck, many of which are difficult to distinguish from the genuine



Types of pincers, the upper pair being a shoemaker's tool, the lower ordinary carpenter's pincers.

article, but, as a rule, are not so carefully made and are distinctly inferior in artistic quality. Examples of old pinchbeck that are worth acquiring include snuff-boxes and patch-boxes, with slips of onyx or agate forming the top and bottom. Vmaigettes, various kinds of buckles, bracelets, and other articles of jewelry set with tortoiseshell, mother-of-pearl, amethysts or topazes. Ring and jewel caskets can occasionally be picked up which are a valuable addition to any collection, these are beautifully ornamented with agate, onyx, caruporum or lapis lazuli. See Jewelry.

PINCHING. This is a gardening term which means cutting off or pinching off the tips of shoots or branches to force the development of others and thus ensure well branched trees or plants. See Pruning.

PINCUSHION. The simplest form is a little bag stuffed with bran and sewn up at the end. Bran is the best material to use, as it is much lighter than sawdust and has not its tendency to absorb damp. The covering material should be strong and closely woven, so that the pinheads cannot pass through and the bran cannot come out through the pinholes. For this reason it is always best to make a bag for the bran, then to cover it with another material such as silk, or velvet and edge with a narrow cord. The damiest dressing table pincushions have detachable, washable covers of embroidered muslin, the cushion being covered with pink, blue, or mauve satin.

PINCUSHION FLOWER. This is the old name for scabious, a plant much in demand for cutting purposes. There are annual, biennial and perennial kinds. The finest of all is the Caucasian scabious, which is popular not done for garden decoration, but as an exceedingly beautiful florists' flower. See Scabious.

PINE. The word is often used loosely to describe various cone-bearing trees, but correctly it is the popular name of those contained in the genus *Pinus*. Some of the pines are of great value as a windbreak for the protection of choicer trees and plants. They are particularly useful for planting in exposed sea-coast gardens. They are evergreen and rather slow growing.

It is wise to plant small trees about 2 ft. high, for they become established more quickly than larger ones. The Austrian pine (*Pinus laricio nigrescens*) is a most valuable windbreak tree. *Pinus insignis*, which is chiefly suitable for mild districts, is also a good shelter tree. The most familiar of all is the Scots pine, *Pinus sylvestris*, a tall handsome tree which reaches a height of 80 ft. or more and will thrive in very exposed places. It furnishes the timber known as deal.

Some of the pines are suitable for planting as ornamental lawn trees in large gardens. One of the most distinct is the umbrella pine (*Pinus pinea*), a flat-topped tree of distinctive growth which can be recommended for gardens in the milder counties. Others are the blue pine (*excelsa*), with grey green leaves, and the Corsican pine (*laricio*), which flourishes in poor soil. The pines are propagated by seeds sown out of doors as soon as they are mature.

Uses of the Wood. The name pine is applied to several varieties of timber, the produce of trees which grow extensively in Europe and N. America. The Scots fir, which is common all over the north of Europe, is called northern pine, or red, yellow, or white deal, according to its character. It is the wood commonly used in carpentry, in house building, for outdoor work and rough work generally. It is cheap, not heavy or difficult to work, and durable, varying in character according to locality and conditions of growth.

Other varieties of pine come from North America, an important one being yellow pine. It is a pale honey-yellow in colour, light, soft,

straight grained and uniform in texture, easy to work, has very few knots, and shrinks and warps very little. For these reasons it is the wood preferred by pattern maker. It is not employed for outdoor work, but in joinery and cabinet work it is the best kind of soft wood, and in furniture it often forms a ground for veneer. Mouldings, panels, and frames are made of it.

Another American wood is pitch pine, highly resinous, strong, and heavy, and is therefore much used for piles, struts, and the like. Reddish-yellow in colour, it has strongly marked annual rings that show as alternating light and dark streaks in the grain, sometimes with a wavy figure, and is rather difficult to work owing to its resinous character. Being clean and attractive when varnished, it is sometimes used for bedroom furniture and also for flooring purposes. In general, however, it is unsuitable for indoor work, especially when close joints are needed, as it shrinks badly. Pitch pine takes varnish much better than it does paint.

PINEAPPLE: How to Grow. Mainly owing to the great quantity of this fruit which are imported the pineapple is now rarely cultivated in Great Britain, although for delicacy of flavour the home-grown pine is unsurpassed. The best method of cultivation is to prepare a bed 3 ft. in depth of fresh leaves in a deep garden frame or pit, which is heated, cover the leaves with a 12 in. layer of leafy soil, and plant the pines in this at about 2½ ft. apart. Considerable artificial warmth is required; the winter temperature should be about 65 degrees. If only a few plants are grown they should be potted in large flower pots 10 in. or 12 in. in diameter. Propagation is easily effected by sucker or outshoots, which, if potted and kept in a moist hothouse, will form roots. The leafy top of a ripe fruit may be made to form roots in the same way.

The botanical name of the pineapple is *Ananassa sativa*. A variety named *The Queen* is best for cultivation under glass in Great Britain. (See Greenhouse.)

Serving the Fruit. To prepare the fresh fruit for the table, cut it into slices with a silver or stainless knife, and cut off the rind, taking care to remove all the woody part. When canned, pineapple retains much of its flavour, and can be served alone with the syrup poured round it, mixed with other fruits to form a compôte or fruit salad, or cut up to make pineapple flans, fritters, etc. Crystallized or glacé pineapple may also be bought in rings or chunks.

Pineapple jelly is made as other table jellies, described in page 638. For fritters, this fruit is used either fresh or tinned, and the batter is the same as that given in the recipe for Apple Fritters (q.v.). Tinned pineapple is used for a flan, which is made as described in page 459. It can also be used as a filling for turnovers and tarts, and to decorate small cakes or layer cakes, though glacé pineapple is more often used for cakes.

Pineapple Cup. Peel a small pineapple and cut it in thin slices. Sprinkle it well with caster sugar and let it stand 6 hours. Put the trimmings of the fruit into a bright stewpan, cover them with cold water, and then boil up, skim, and simmer them till the flavour is extracted. Strain this essence over the fruit, add the juice of 2 oranges, 6 oz. caster sugar, and 1½ pints white burgundy. Stir and then cover over, and keep in a cold place. When required add a syphon of soda or seltzer water.

Pineapple Mould. Mix a dessertspoonful chocolate powder to a smooth paste with a little milk taken from ½ pint; boil up the remainder of the latter and stir it into the chocolate. When it has cooled slightly, add it to a beaten egg, strain the whole into a jug

placed in a saucepan of cold water over the fire and cook it until the custard thickens. Then take it from the pan, add 3 dessertspoonfuls of sugar and leave it to get cold.

Rub the contents of a small tin of pineapple through a sieve and mix the pulp with the chocolate custard. Put ½ oz. leaf gelatine in a saucepan with 1 gill pineapple syrup, let it dissolve slowly, and then strain it into the whole. Pour the mixture into a wet buttered mould, leave it to set, and after turning it out fill up the centre with a dollop of tiffle which had cream sweetened and flavoured with it.

Pineapple Pudding. To make pineapple pudding, 3 oz. crystallized pineapple should be used, but the fresh or tinned fruit would do quite well if the juice is drained away. Put into a stewpan ½ pint milk, with 3 oz. sugar, and as soon as it comes to the boil draw it back from the fire and stir in quickly 4 oz. fine sifted flour, then return it to the heat and beat it well. As soon as the paste ceases to adhere to the saucepan it is done. Let it cool slightly and mix in the well-beaten yolks of 3 eggs, add also the pineapple, chopped, and then fold in the whipped whites of the eggs. Pour it into a buttered mould and steam for 1½ hours. Serve it with sweet sauce. If crystallized pineapple is used flavour the sauce with a few drops of pineapple essence. If fresh or tinned fruit is used, the sauce with the juice or syrup in the tin. See Fruit Salad, Marmalade, Salad.

PINEAPPLE FLOWER. Alternatively known as *Echinus*, the pineapple flower, which belongs to the order Labiales, is a half hardy bulb, suiting in sandy loam in a cool house. As a rule it is grown only in pots in the greenhouse, but in mild districts and in sheltered positions it will sometimes do well out of doors. It reaches a height of about 2 ft., and flowers in August. Propagation is by offsets in spring. The species *puncata*, green and rose, is usually grown.



Pineapple Flower, a bulb suitable for pot cultivation

PINE WEEVIL. Sometimes known as the conifer beetle, this is a pest which devours the bark of such trees as pine, fir, and spruce. Eggs hatch out into fleshy white larvae, about ½ in. long, pupating in autumn, and emerging as weevils in June. All old stumps of the trees mentioned should be cleared away and all branches of infested trees well shaken to cause the pests to fall upon sheets of paper spread beneath; they are then collected and burnt. See Insecticide.

PING PONG. This game is an indoor form of lawn tennis. Rules were drawn up and an association

formed, but after a time the game began to be called table tennis. The ping pong association was therefore dissolved and the game is now governed by rules drawn up by the Table Tennis Association. See Table Tennis.

PINGUICULA. Butterwort is the common name of this group of low-growing hardy plants. They form



Pinguicula alpina, a hardy perennial bearing yellow-tipped, white flowers, suitable for the bog garden.

rosettes of leaves, bear violet-like flowers on slender stalks in May and are suitable for planting in the bog garden or moist spots in the rock garden. One of the prettiest of these flowers is *grandiflora*, with violet blue flowers; the blooms of alpine are white marked with yellow. The leaves are hairy and secrete a fluid to trap small insects.

PINHOLE PHOTOGRAPHY. A minute hole in a light-tight box forms a substitute for a lens. The apparatus is simple, and no focusing is required. It may easily be improvised for testing purposes from any rectangular light-tight box at one end of which is fitted a very thin metal plate, such as a piece of copper foil, and at the other a photographic plate kept in place by a clip. A small hole is made in the copper foil with the point of a needle, and kept covered until exposure is made.

The late Alfred Watkins, of Hereford, prepared a table for sizes of pinholes based upon the use of sewing-needles which are standard in size; metal disks pierced with standard-size holes for pinhole cameras can be obtained from dealers which can be fitted into the ordinary camera in place of the lens. While the distance between the hole and the plate does not affect focussing, it does affect the size of the image thrown on the plate, the greater the distance between hole and plate the larger the image.

The sizes of holes to give the best definition for any particular distance between hole and plate, and a means for calculating the approximate exposure, are given in Mr. Watkins' table as follows:

Needle	Distance	Best Distance	Calculate Exposure
No.	in.	Hole to Plate	as for
1	1/2	40	1.96 x 60
4	1/4	20	1.80 x "
5	1/4	15	1.75 x "
7	1/4	10	1.60 x "
8	1/4	8	1.56 x "
10	1/4	5	1.40 x "
12	1/4	3 1/2	1.35 x "

Thus, if the pinhole is to be used in an ordinary camera with a total extension of 8 in., the hole should not be made with a needle larger than No. 8. The actual exposure is then calculated by referring to an exposure meter or table. Having calculated the exposure according to the speed of the plate and actual lighting conditions at the aperture or f/No. given in the table for the size of pinhole in use, it is multiplied by 60, the resulting exposure being in seconds.

Alternatively the figure obtained may be reckoned as minutes. Thus, for instance, on a bright summer day, using No. 8 pinhole, the meter may give 4 sec. for f/56; this is reckoned as 1 min., or 20 sec. The hole made by the needle must be perfectly clean, and any burr made in piercing the foil carefully rubbed down with emery paper or file. Only in a very bright light can the image be seen on a focussing screen. Therefore a good view finder is essen-

tial. The larger the plate used in a pinhole camera the larger the angle of view, and this property makes the pinhole very valuable in cramped places, such as buildings in narrow streets or interiors where it is impossible to get sufficiently far away with an ordinary camera to include the whole subject. For landscape purposes with an ordinary lens the angle of view may vary from 20° to 50°. With a pin hole it may be anything up to 100°.

Another useful property of the pinhole camera is that its image is mathematically correct, and may be used for calculating heights and distances. The size of the image depends upon (1) the size of the object, (2) distance from object to pinhole; and (3) distance between plate and pinhole. It is directly proportional to (1) and (3) and inversely proportional to (2), so that if two qualities are known the third is easily calculated. Thus, to find the size of an object, the distance (2) being known, multiply the size of the image on the photograph produced by the camera by (2) and



Pink: two beautiful varieties. Left, fine flowers of *Dianthus Herberthii*; right, blooms of the variety known as *Queen Mary*.

divide by (3). If the size be known and the distance required, divide (1) by the size of the image and multiply by (3). See Exposure, F-Numbers, Lens.

PINION. A small cog wheel that engages with another cog wheel usually of a greater diameter is termed a pinion, and is constructed of either steel, cast iron, brass, phosphor bronze or even vulcanized fibre.

Apart from its use in transmitting rotary motion the pinion is extensively used in conjunction with a rack, as for example in the focussing arrangement of a microscope. Very small pinions, such as are used in clock and watch making, are generally machined from pinion wire, which is manufactured in lengths, diameter, tooth sections, and numbers of teeth according to requirements. See Gear.

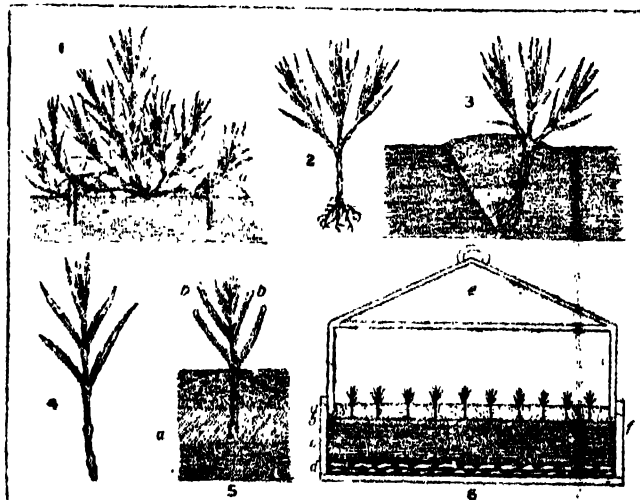
PINK. The pink is one of the most delightful of all the old-fashioned garden flowers and unsurpassed as an edging plant for beds and borders. Its grey leaves are attractive all the year round, and it yields a

profusion of fragrant flowers in spring. There are two chief classes, the border and the alpine or rock garden pinks. The border pinks flourish best in well-drained rather light soil; clayey soil can be made suitable by adding leaf-mould, sand and grit. Plants may be done in autumn or spring.

Propagation is by cuttings taken in June or July and inserted in sandy soil out of doors and covered with a bell glass or handlight. In four or five weeks the cuttings will be rooted and the covering can be removed; they may be planted out in autumn. Two kinds of cuttings are used—the piping, which is the top of a shoot pulled out, and the ordinary cutting, 3 in. or so long, made by severing the shoot just beneath a joint and removing the lowest leaves. Pinks can also be increased by layering. The double white, named Mrs. Sinkins, is still the favourite border variety, but others are listed in catalogues. There are some beautiful flowers in the *Herberts* strain of pinks. The old faced pinks are seldom grown now, but varieties may be obtained from specialists.

In recent years the perpetual flowering or Allwood pinks have been raised and have become very popular. There are many named varieties in rich and varied colours. They are increased by cuttings or by layering in summer. Border pinks are very easily raised from seeds sown in boxes of light soil in a frame in May; the seedlings will be large enough to plant out of doors in autumn.

The alpine pinks are exquisite rock garden flowers suitable for planting in gritty soil in sunny places. The most popular of all is the Cheeddar pink (*Dianthus caesioides*), which forms a wide low tuft of leaves and bears small rose coloured blooms in June. The Maiden pink (*Dianthus deltoides*), carmine rose, the alpine pink (*alpinus*), rose, fragrant, white, and the glacier pink (*neglectus*), rose red, are other beautiful sorts. *Alpinus* and *neglectus* are the most difficult to manage successfully; they need thorough drainage and gritty, loamy



How to grow Pinks. 1. Layering an old plant; 2. Rooted layer, 3. Same transplanted to shallow drill with sand at base. 4. Cutting or piping; 5. Same prepared with leaf tips removed (b) and properly planted; 6. Propagation under handlight; 7. Box

soil containing lime. These two, together with glaucous, should be tried in the moraine. See Border: Carnation.

PINKING. Pinking is a good method of finishing the edges of material that is not suitable for the usual double turning. The edge is scalloped in small triangles, or half-diamond shapes. This is done to prevent the material from raveling along the raw edge, and to soften the appearance.

To pink an edging, ordinary scissors can be used in default of special pinking scissors. A line of tacking should be run along the edge where the head of the scallops is to be, or a scalloped transfer can be ironed on to the material to act as a guide. The material should then be folded between the scallops, and a slanting cut made to the depth required or to the line of tacking. On oilcloth or leather, the points can be drawn with chalk or pencil.

PINS AND NEEDLES. The prickling sensation, popularly termed pins and needles, is one form of paraesthesia, or a disturbance of sensation, which may be experienced on parts of the body in nervous and other diseases. These may be due simply to debility, and an iron tonic may cause their disappearance.

Pint. The measure is used for milk, beer, and other liquids. It consists of 4 gills, and 2 pints make a quart.

PINTAIL: The Duck. A pintail is a type of wild duck that derives its name from its long, pointed tail, which is almost invariably roasted, and, except for the fact that the feet are usually left on, it should be prepared and trussed in the same way as an ordinary duck. About 20 min. is the time required for roasting, and because the flesh of the pintail is rather dry it should be basted frequently. Serve it with some sharp sauce and garnish it with watercress and cut lemon. See Duck.

PIP. The kernel or seed of fruit, as of an apple, pear, or cherry, is known as the pip. Although plants and trees may be raised from pips the process is not advocated for practical purposes, because most of the seedlings would be worthless, and the trees are slow in reaching the fruit-bearing stage unless budded on other stocks. For those who nevertheless desire to experiment in the propagation of fruit from pips the following information will be useful.

For apples and pears the pips may be sown when fully ripe, in pots of sandy loam, and placed in a cold frame. Watering must be very moderate until the seedlings have grown 3 or 4 in., and then they are transplanted to open ground. Further periodical transplantings will be required as the trees increase in size, and they will probably bear fruit in 6 to 10 years after the original sowing. Apricots, cherries, damsons, and plums, as well as apples, pears, peaches and nectarines, may be raised in a similar manner. Amongst other fruits likely to give results from pips are raspberries and strawberries. See Apricot, Cherry; Pear.

PIPE: For Smoking. Wood of various kinds is used in the manufacture of pipes. Briar is the favourite, but Australian myall-wood, ebony, cherry, and other kinds of wood are also employed. A good pipe is made from thoroughly seasoned wood, and the harder it is the better. It should have a nice straight grain, without knots or flaws of any kind. The colour varies from rich shades of chestnut or walnut, with a tinge of red, to the glossy black, which many smokers prefer.

For the mouthpiece vulcanite, made or finished by hand, is the material chiefly used. At one time a silver band or mount on the stem was a customary ornament.

Regular smokers usually keep one or two good briars for everyday use, reserving the

meerscham, should they possess one, for occasional enjoyment together with such varieties as the cherrywood or the corn cob. The two latter are amongst the cheapest and simplest types, consisting of the hollowed out bowl of cherrywood or cob, into which the stem is thrust. Patent varieties are on the market, the object of which is to collect or get rid of liquid accumulations of nicotine.

When first smoking a new pipe, shred some tobacco well and pack about a third of a charge smoothly and evenly in the bowl, being careful not to ram it right down to the bottom of the pipe. Light the tobacco carefully, making sure that the whole top of the surface is aglow, and smoke it indoors, very slowly. If the tobacco burns down one side, as a result of bad packing or a strong draught, the new wood is bound to suffer from the unequal distribution of the heat. It will suffer equally from excessive heat developed by too rapid drawing at the pipe. A new pipe should be cleared gently of all unconsumed tobacco each time it is smoked. Never refill and relight it, nor, indeed, any pipe while it is still hot from a previous smoke.

A pipe should not be knocked against the heel of the hob or mantelpiece, or, when out of doors, on a wall or post or railing, to get rid of the unconsumed residue of tobacco, as this very often results in cracking the pipe. All such remaining tobacco should be removed by scraping it out gently with the blade of a pocket knife. See Tobacco.

PIPE: For Gas, Water, Steam. Pipes of all kinds play an important part in the home. Water is brought into the house through a lead pipe and taken to a cistern or receptacle in the roof. When it is intended to fit a hot-water supply the pipe is generally of iron and may be plain or galvanized, the latter resisting the attack of rust. In some cases the water is supplied through a copper pipe, especially in connexion with hot water supply in districts where the water has a corroding action on iron. Gas is conducted through a rough iron pipe known as gas barrel, which is made of wrought iron and is measured by the nominal size of the pipe. Thus a $\frac{1}{2}$ in. gas pipe means that the pipe measures $\frac{1}{2}$ in. internal diameter, while the outside is about $\frac{3}{4}$ in. diameter. Hot water barrel and steam pipe or barrel, stronger varieties, are measured in the same manner.

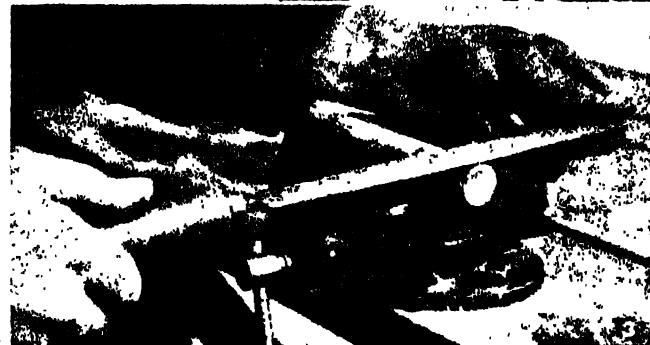
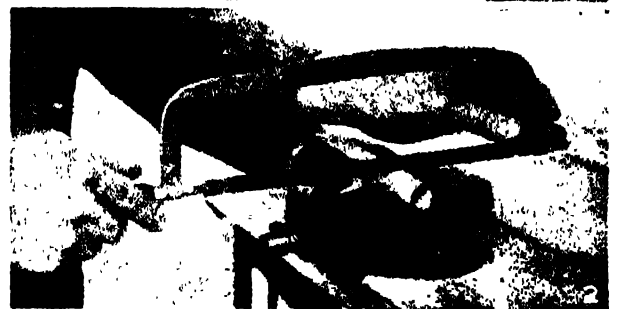
In contradistinction to gas barrel, brass and copper pipes are measured by the outside diameter and are purchasable in various thicknesses or gauge sizes. The higher the number the thinner the tube; a normal thickness for gas fittings is No. 16 g. i. e., nominally $\frac{1}{16}$ in. thick. This class of

pipe is made in two grades. The one most generally used is made with a seamed or brazed joint; a superior tube is known as seamless and is made from the solid. The latter, or triplet drawn, as it is sometimes called, is usually more accurate to size and forms a stronger tube than the seamed. Larger diameters such as 2 in. and upward are made in thin gauges.

Pipes are joined in various ways, according to their nature and purpose; for example, gas and hot water pipes are connected by means of fittings with screw threads cut on or in them, and screwing to corresponding threads cut on the pipe. Lead and copper pipes are joined by a soldering process, and the joint is known as a wiped joint. Brass and copper pipes are joined with screwed fittings, and also by brazing and soldering to suitable fittings.

Joints in Gas or Hot Water Barrel. Instructions for manipulating lead piping are given in the article on Plumbing. The amateur should be very chary of doing anything to the gas service pipes, as there are many snags for the inexperienced. Gas barrel, however, has many other uses than its most common one, and can be employed in conjunction with certain stock fittings to make stanchions, handrails, etc.

The home worker may at some time or other wish to alter his hot water supply system, or, for example, take a branch from the existing water pipe to a fresh point. This may be accomplished by unfastening one of the joints of the existing pipe, after having turned off the water, or isolated that part of the pipe so that the water cannot escape.



Pipe Joints. Fig. 1. Removing plug from T-piece. Fig. 2. Cutting pipe to correct length by means of a hack-saw. Fig. 3. The end of the pipe must be filed up before screwing is begun.

If there is a T-piece in a convenient position and the outlet from the T-piece has been plugged, the best plan is to commence the new work from it. In Fig. 1 such a pipe is shown, the plug being removed with a spanner or pipe wrench.

A piece of pipe has to be cut to length, as in Fig. 2, the ends of the pipe rounded off with a file, and the scale, or hard

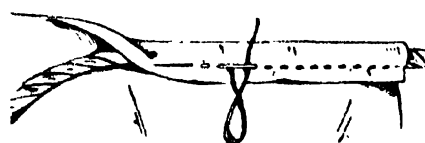
outer surface, removed by filing, as in Fig. 3. The pipe is set vertically in a strong vice, or horizontally in a proper pipe vice, and a thread cut upon it with stocks and dies, as in Fig. 4. To test the thread, a socket or other standard screwed fitting should be tried in place, to ensure that a perfect fit results; if necessary the die is adjusted and run over the pipe again, so that the fitting screws on evenly and firmly. Both ends of the pipe should be treated in the same way. The next step is to screw the pipe into the T and to make the joint water or gas tight with a mixture of red lead and gold size or a good thick paint.

This is smeared on with a brush, a few fibres of hemp twisted into the screw thread, and the pipe screwed into the T piece (Fig. 5). To prevent the pipe sagging it may be supported temporarily with a nail, pipe hook, or a strut of wood. If it is desired to terminate the branch at one end of the length of pipe, this can be effected by screwing in an elbow on the end of the pipe and screwing a plug into it, but if it is necessary to carry the pipe upward or downward, a sufficient length of it must be screwed into the elbow, and for branch fitting.

A great point is to make the screw threads a good fit, to make them tight with the aid of red lead, and to cut the lengths correctly at

they have rooted, when they may be planted out. Pippings may be taken at any time during July and August. See Curation, Garden, Layering, Pink.

PIPING : In Needlework. A length of piping cord encased in a tube of material is employed in dressmaking and in making covers, cushions, curtains, etc., to finish off



Piping in Needlework. How the cord is encased in a tube of material

the edges, in an ornamental manner. If these edges are curved, the piping is made separately, and applied afterwards.

To make it, take a crossway strip of material 1½ in. wide or more, according to the thickness of the piping cord, which may be had in many different sizes. Fold one of the longer edges over nearly down to the other, and slip the cord up into the fold, then tack along close up to the cord to keep it in position. Lay the piping over the right side of the article to be piped so that the narrower of the two strip edges faces this, and the cord lies inward; then stitch the strip down to the article close up to the cord. Roll the cord inward so that it lies along the top of the article, and hem down the wider of the two raw edges. If the edge that is to be piped is

are sometimes known as bitfins. They may be used for winter fruit salads and puddings, but require to be washed thoroughly before use and to be steeped in cold water for 24 hours. See Apple; Dried Fruit.

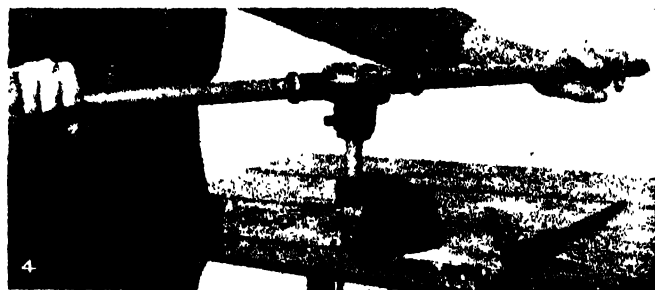
PIQUÉ A material often used for making detachable coat-slops, collars and cuffs, piqué is generally white or light coloured. The surface is ribbed into cords, and in true piqué these run crossways on the cloth, although lengthwise cords are often sold under the same name. The cloth is a strong cotton one which wears and washes well. A silk material ribbed to look like this cotton cord is known as silk piqué.

Piqué embroidery is a form of white stitching upon a strong foundation. The outlines are traced by a cord made in crochet chains or overcast, while the fillings are in different stitches to imitate a figured material, such as linen damask.

PIQUET : How to Play. Piquet is a card game for two players, and is played with a pack of cards from which all from the six to the two have been thrown out. The 32 cards rank as in whist, and the ace is high in cutting and play. There are no trumps.

The dealer deals 12 cards, 2 or 3 at a time, to his opponent and himself, face down. The remaining 8 cards are placed on the table face downward in a pack of 5 laid across a pack of 3. The object of the game is to score for certain combinations held in the hand, and afterwards by the winning of tricks. First of all each player examines his 12 cards, and begins to declare, beginning with the dealer's opponent. If the latter finds that he has no king, queen or jack in his hand, he calls out *carte blanche*, and scores 10 points. If the dealer also has *carte blanche*, he does not announce it until his opponent has discarded.

The dealer's opponent may discard any number of cards from 1 to 5, and at least one. Whatever number he discards he takes a corresponding number from the top of the pack. If he does not take 5, he may look at those he leaves. If he takes 3, for example, he may look at the next 2. The dealer then discards and draws a corresponding number of cards from the pack. He is bound to discard one card, and may take all the cards which remain, if he wishes. He may look at any of the cards he leaves behind, but if he does so his opponent has the right to look at them as well, either after playing his first card or naming the suit that he intends to play.



the start. Another point to be in mind is to work progressively from one end upward, otherwise it will be necessary to use connectors. These are long sockets and to use them one of the ends of the pipes to be joined must be screwed for a sufficient length to allow the socket to screw right on to it. The ends of the pipe are then drawn as close to one another as possible, the socket unscrewed from one and partly on to the other, both of them being secured with locknuts tightened up on the ends of the socket, as in Fig. 6. The nuts have to be fitted before the socket is screwed on. A sound joint is made with twists of hemp soaked in a mixture of red lead and gold size.

When an iron pipe is to be joined to a lead pipe it is necessary to use a brass union fitting and to solder the lead pipe to the tail of the union; otherwise the fitting work may proceed as described. See Overflow.

PIPE CLAY. White clay, resembling potter's clay is used for making tobacco pipes and other purposes. The peculiarity of this variety of clay is that it is soft and greasy to the touch and very tenacious. When used for whitening leather parts, of military accoutrements its adhesiveness is increased by adding white of egg to a thick cream made by rubbing pipe clay with water.

PIPING : In Gardening. This is the name given to a special kind of cutting used in propagating pinks; it consists of the top of a shoot pulled out instead of being severed with a knife. To take a piping, the top end of a shoot is held in the right hand, while the left hand grasps the stem. The right hand gently but firmly pulls the stem apart, showing a hollow pipe, like a quill or tube.

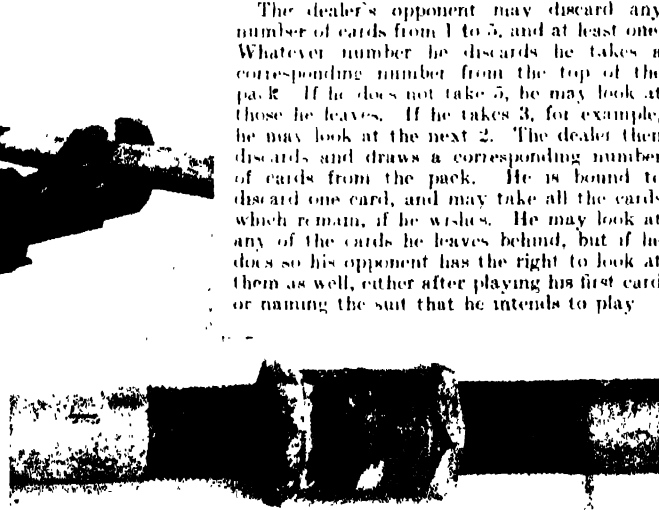
These pippings, when taken, are planted in a mixture of silver sand and finely-sifted soil, watered and covered with a handlight until

quite straight, it is just sufficient to turn the edge of the material itself in over the cord, and to run along close up to it; but this cannot be done if the piping is to be of a contrasting colour, as often happens. Piping can be used in rows

as an ornamental trimming, by taking up a tuck in the material and setting the cord at the back of the fabric, so that this may be picked up inside the tuck, which is then stitched. Sometimes the material is pushed along the piping, to give a rucked effect. This style is used in making cushions.

PIPPIN. A popular type of apple is known by this name, well known examples being Cox's Orange pippin, Allington, Kerry, King of the Pippins, King's Acre, Sturmer, Normandy and Summer Golden pippin. The first named is the finest dessert apple known.

Normandy Pippins. Dried apple rings are sold as Normandy pippins, although they



Pipe Joints. Fig. 4. The turnings are cut with a large-sized stock and dies. Fig. 5. The pipe joint shown painted and being screwed up with the wrench. Fig. 6. Joint made with a connector and two locknuts.

The hands being made up, the dealer's opponent begins to declare his hand. He first calls the point. This is the suit which has the greatest pip value. The player first of all announces how many cards of his longest suit he has. If he has more cards than the dealer, the latter says Good, and his opponent scores the point. If he has less, the dealer says Not good, and scores the point. If the number of cards is equal the pips are counted, aces counting as 11, court cards as 10, and the other cards at their face value. If the pips are equal, neither player scores the point. The point cards must be shown to a player's opponent when demanded.

Each card in a point score one. A point of six counts 6, for example.

The second call is sequence, three or more cards of a suit in order. The player with the longest sequence counts it. If the number of cards in the sequences are equal, the highest sequence scores. The player with the best sequence also counts all other sequences he may hold, his opponent counting none. If the best sequences are equal, neither side scores. A sequence of 3 cards counts 3 points; of 4 cards, 5 points; and of any greater number, 10 points plus the number of cards in the sequence.

Thus a sequence of 6 counts 16 points. As with the point, sequence must be shown when demanded. The third call is triplets or fours. These are 3 or 4 cards alike, as 3 kings or 4 aces, and the best scores. Three of a kind counts 3 points; 4 of a kind, 14 points. The player with all highest triplet or 4 counts all others in his hand, his opponent counting none. The hands must be called in the regular order: point, sequence, triplets or fours.

How to Score. Each card led counts one point, and as each point in declaring and afterwards is made, the players announce their total score. If the dealer's opponent scores 30 points by declaring his combinations and by the cards he leads before the dealer scores, he scores an additional 30 points known as pique. If either player reaches 30 before playing a card and before his opponent scores, he scores an additional 60 points for repique. The dealer's opponent leads and adds one point as he does so, and the dealer must follow suit. If the winner of a trick also led, he counts one for his next lead, but if the other player wins the trick he counts one for winning it, as well as one in the usual way for his next lead. The winner of the last trick always scores one extra point, no matter which player led.

If each player wins 6 tricks it is a tie, the player who wins more than 6 tricks scores 10 points for cards, and the player who wins every trick scores 40 points for capot. This score includes the point for the last trick. The game is 100 or 101 points up, and scoring is in the following order, since each player may actually be able to make sufficient points to score the 100 or 101, and so the order of scoring becomes important. Carte blanche is scored first, and then point, sequences, fours and triplets, points made in play, and finally the cards.

In Rubicon piquet there is no definite score. Each game consists of 6 deals, and the player making the highest aggregate wins. The winner deducts the loser's score from his own and adds 100 points. If the loser fails to reach 100 points the winner adds the loser's score and 100 points to his own. Pron. Pik-et.

PISE-DE-TERRE. This is the name given to the building of walls and structures with earth. Shuttering is erected to the thickness of the wall, and the earth is filled in and rammed thoroughly. Sometimes the base is made of several courses of brick or stone, to protect the pise-de-terre from dampness.

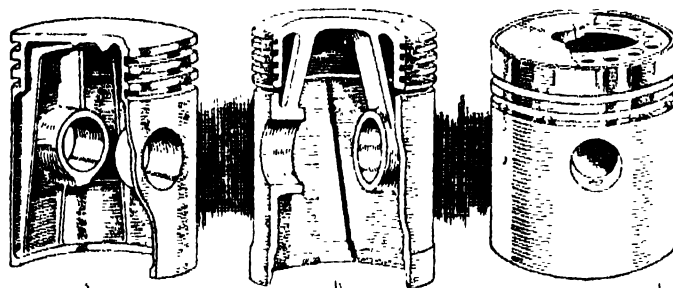
PISTACHIO. The small green kernel of the pistachio nut is used in cookery as a decoration for either meat or sweet dishes. In galantine those nuts are often introduced into the forcemeat stuffing, forming a contrast in colour to the red tint of the tongue or ham or the black of the truffle. Pistachios enter into the composition of various dinner sweets much in the same manner as almonds. Pounded or chopped pistachios may be made into sauces for puddings by employing any method adapted to almonds.

Pistachio Cream. To make this cream, blanch and peel 2 oz. pistachio kernels and pound them in a mortar with a few drops of rose water. Make a rich custard, using $\frac{1}{2}$ pint

milk, the yolks of 3 eggs, and 2½ oz. castor sugar. Cool the custard slightly, then mix in by degrees the pounded nuts and, in order to heighten the colour, add, if necessary, a little spinach green or sap-green colouring.

Dissolve 1 oz. leaf gelatine in 2 table-spoonfuls water, and after the custard and the nuts have been passed through a sieve add the gelatine. Last of all fold in lightly $\frac{1}{2}$ pint whipped double cream, and pour at once into a mould rinsed out with melted jelly and decorated suitably. Set it on ice and turn it out of the mould when the cream is to be served. The custard must not be quite cold when the gelatine is added, or it will begin to set before the cream can be mixed with it.

PISTON. In an engine the piston is a moving part that has a free reciprocating movement in the cylinder and takes the pressure of the



Piston. Fig. 1. Diagram showing types of piston used in internal combustion engine design: A, cast iron; B, aluminum; C, aluminum and bronze.

expanding gas, thus transforming it into mechanical motion, via the connecting rod and the crankshaft.

The piston of an internal combustion engine as used on motor vehicles is of the type known as trunk piston, being long as compared with that of a steam engine. It serves as a guide for the small end of the connecting rod to which it is connected by a gudgeon pin.

Pistons for petrol engines are constructed of cast iron, machined as light as possible, of aluminum alloy, and of aluminum and bronze (Fig. 1). Generally the top, or piston head, is flat, and bevelled at the edge, although sometimes a slightly domed head is employed. In the majority of 2-stroke engines the piston is provided with a specially shaped deflector on the head.

The purpose of this is to direct the path of the burnt gases, as well as to retard the moment at which the fresh gases will unavoidably come in contact with the tail end of the burnt gases.

The fitting of a piston in a cylinder is not sufficient in itself to prevent leakage of compression between the two surfaces, and for this reason what are known as piston rings are fitted in grooves machined round the piston, which by expanding against the cylinder wall prevent a leakage at this point.

Fig. 2 (above). Types of piston ring. Fig. 3 (below). Scraper rings, showing oil channel.

Piston rings are always made of close grained cast iron, machined all over, and ground to a fine limit so as to ensure a perfect fit in the groove. There are several methods by which a perfectly uniform expansion of the ring is assured, so that it exerts an equal pressure on the cylinder wall over the whole of its diameter. By the first method the inside diameter of the ring is machined slightly eccentric to the outside diameter, and slotted or cut through at the thinnest part; by this means the bending moment will be equal from any point, thus allowing the ring to keep a perfect circle when closed to the diameter of the cylinder.

By the second method the rings are turned a little larger in diameter than the cylinder, slotted to leave a gap, and sprung into the cylinder. The gap must be large enough, when the piston is in place, to allow for proper expansion of the ring.

In another method, the inside diameter of the ring is machined from the same centre as the outside diameter, and slotted. It is then permanently expanded, so as to give the necessary tension when closed to the diameter of the cylinder by means of hammer blows at close intervals round the inside diameter.

The rings are arranged so that the gaps do not fall in line. In order to obtain as perfect a compression as possible, some makers fit two thin rings in one groove, placing the slots on opposite sides; by this arrangement loss of compression via the slots is greatly reduced. This has led to the introduction of the double twist piston ring shown in Fig. 2, which presents an unbroken surface to the cylinder wall over the whole of its diameter.

Methods of shaping the slots so that as little compression as possible shall get away at this point are shown in Fig. 2. Scraper rings of various constructions are fitted to remove surplus oil from the wall of the cylinder, one being located usually at the lowest of the grooves, just above the gudgeon pin. Small holes in the piston wall carry the oil thus removed to the inside. The ring is grooved, chamfered or stepped, and has a sharp edge for scraping off the oil (Fig. 3).

The removal of the cast iron rings from the piston is a job that calls for considerable care, and is best carried out as follows:

Obtain 3 or 4 strips of sheet tin about $\frac{1}{4}$ in. wide, and insert them all side by side at one point between the ring and the piston. Next work them round to the positions shown in Fig. 4. By so doing it will be an easy matter to remove the rings without fear of breakage. Never attempt to remove more than one ring at a time. To replace the rings, it is a good plan to use the strips as a means of keeping the middle ring, where three

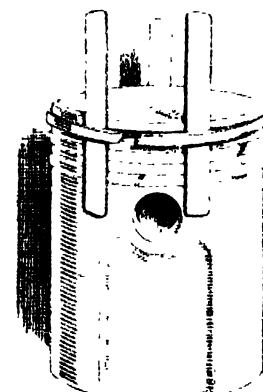


Fig. 4. Removing piston rings by means of strips of tin inserted and worked round.

are used, from entering either the top or bottom groove.

On examining the rings, one or more may be found to have extensive brown marks on the face. This will mean that the ring so marked is a bad fit to the cylinder wall. The only cure is to fit a new ring. In the case of one ring only being so marked, a varying degree of porosity of the cast iron, causing unequal heat distortion, will be the most likely reason, but where all the rings are affected, then a badly worn cylinder is responsible. After a considerable mileage the rings may be found to be slack in the grooves. The only remedy is to have the grooves turned true, and a new set of rings fitted.

It is essential to the proper functioning of piston rings that all carbon deposit is removed from the bottom of the grooves, and a blunt instrument only that will not damage the walls of the grooves should be used for the purpose. See Internal Combustion Engine; Motor Car.

PIT: A Card Game. Pit is a card game played by 3 to 7 people with a special pack of cards, and is so called from the slang name for American corn exchanges, which are known as pits. The cards number 63, and contain 7 suits of 9 cards each. The number of suits used must correspond with the number of players. The cards are named after the cereals wheat, corn, oats, barley, etc., and the object of each player is to obtain a complete set or corner in one cereal before any other player.

The cards are shuffled and dealt one at a time in the usual way. The suits are of varying values, which are indicated on the cards. Thus, wheat may be 100, corn 75, and so on. The game is won by the player who first succeeds in scoring 500 points by the corners he makes in any cereal. A minute is allowed players to sort their cards and the pit is then opened. Each player tries to exchange cards he does not want for an equal number of cards he does, but without naming the actual suits he wants. Every player shouts out the number of cards he wants, and tries to shout down the opposing players. "Trade two," shouts one player; "three," cries another; "four," yells a third, and so on. The cards traded must be all of the same suit. Immediately a suit is complete the player shouts out "Corner in wheat," or whatever cereal it may be. After each corner the player is credited with its value, and the cards are shuffled and dealt afresh.

PITCH. Pitch is the black residue in the distillation of tar. Vegetable pitch is produced in Sweden, and mineral pitch is obtained in large quantities from gas tar. Damp walls are effectively treated by painting them with melted pitch. Another method is to paper the walls with paper impregnated with soft pitch. Other uses to which pitch is applied are as a component of brickettes, for making black varnish, as a waterproof coating for roads, and as a protective paint for iron.

Yellow Burgundy pitch is used in making plasters which are applied to the chest in affections of the lungs. The pitch is melted and spread on thin leather by means of a hot iron. The plasters are also applied to the loins in lumbago and for relieving rheumatic pains.



Pitcher Plant. Curious hot-house plant known botanically as *Nepenthes*

PITCHER PLANT. The peculiarity from which the pitcher plant obtains its name is the fact that the mid ribs of the leaves extend beyond the ends, and each forms a sort of jug or pitcher, with a lid. When a fly or other insect happens to fall into the pitcher, its slippery mouth, which is also furnished with stiff hairs or bristles, prevents the escape of the insect. The leaves are green, sometimes with brown or red blotches, and the plants should be grown in a hot-house, in baskets of peat and sphagnum moss, suspended from the roof of the house. They require plenty of moisture, and should be shaded from the sun.

The botanical name of the pitcher plant is *Nepenthes*, but there is another genus with the same English name and of similar habit. This is *Sarracenia*, the side saddle plant, or American pitcher plant. It flourishes in peat and moss, and will thrive in a cool house. There are

several sorts, with flowers of various colours. The *Sarracenia* requires very little water in the winter-time. The pitchers are richly marked, and possess the same insect-trapping qualities as *Nepenthes*. One kind, *S. purpurea*, is hardy, and may be grown in the bog garden, or in a moist corner of the rock garden, in a peaty soil. The surface of the soil should be kept covered with moss. All kinds are increased by division in early spring.

PITCHFORK. The sharp-pronged instrument known as a pitchfork is chiefly used in farmwork, for forking hay or manure and for other purposes. The common type has two slightly curved steel prongs about 1 ft. in length and spaced from 6 to 9 in. apart. At the back end of the prongs two lugs are formed, and to the inside of them is attached a long handle, usually of ash or hickory. The length of the handle is about 5 ft., with a diameter of 1½ in. to 2 in. The ends of the prongs are often turned out slightly at the ends to enable the fork to retain the load it has picked up.

A common use of the pitchfork is in the construction of haystacks, the tool being used to toss the sheaves from the hay cart to the top of the rick. Another application is in the distribution of manure over a field. The pitchfork is almost exclusively used for farm and small holder's work.

Pitch Pine. See Pine.

PITTOSPORUM. This group of evergreen shrubs or small trees is hardy only in the milder parts of the country. They thrive in sandy, loamy soil to which a little peat may be added with advantage. In other districts they should be planted against a sunny wall, or in tubs, and kept under glass safe from frost in winter. *Tobira* and *undulatum*, with white sweet-scented flowers, and *eugenioides*, with pale fragrant blooms, are some of the best. Propagation is by cuttings placed in sandy soil in a frame in August.

PLACKET. The slit or opening in the side of a skirt is usually known as a placket. It should be just large enough to enable the skirt to be put on and taken off with ease, and is prepared by opening the seam from the waist downward. Two pieces of material, each about ½ in. longer than the opening and 4 in. and 2 in. wide respectively, are then required. The wider piece serves as an underlap, being doubled over and sewn to the left side of the

skirt, while the remaining piece is faced to the right side. Press studs are generally used to fasten.

PLAGUE. The acute infectious disease known as plague, bubonic plague, or black death, has spread over the world at various periods, causing a heavy mortality. It is endemic in E. Asia. It is due to infection with the *bacillus pestis*, which may gain access to the body in food, by inhalation, or by the bites of fleas or other wounds. Rats are mainly responsible for its spread. Preventive measures include isolation and disinfection, the destruction of rats and other vermin. Curative measures include various sera.

PLAICE. The freshness of plaice can be determined by the orange-coloured spots with which the fish is covered. These should be bright, any tendency to dullness being an indication that the fish is stale. To prepare stuffed plaice, wash, clean, and dry the fish, remove the fins and head, and slit the fish down the centre to the bone, making the incision on the side covered with black skin. Lift the flesh with the knife on both sides of the bone, and fill as full as possible with forcement, and then lay the plaice in a tin containing a little melted butter or margarine. Brush some of the fat over the top of the fish, sprinkle the latter with brown breadcrumbs, and bake it in a warm oven for about ½ hour, basting it occasionally with the fat. Sprigs of parsley and slices of lemon may be used as a garnish. A suitable sauce such as *maitre d'hôtel* or tomato sauce should be served in a sauce boat. Complete instructions for blleting and frying plaice are given under the heading Fish (p.v.), on page 457.

Plaice au gratin may be prepared by washing a plaice, trimming the tail, and removing the fins, eyes, and dark skin. Put it in a gratin dish, place over it 1 oz. butter cut into small pieces, and add also ½ gill milk and salt and pepper to taste. Put the fish in a moderately hot oven, cover it with a plate, and bake it for about 20 min. Pour what remains from ½ pint of milk into a saucepan, heat it up with 1 oz. butter and seasoning to taste, and when it is warm pour it over 1 oz. flour previously mixed to a smooth thick paste with a little water. Put the whole back into the saucepan, stir it well until it boils, continue boiling for 6 min., and then stir in 1 dessertspoonful grated cheese. Take the fish from the oven, pour the boiling sauce over it, and on top sprinkle another dessertspoonful grated cheese. Return to the oven or place under the grill until the cheese melts and browns.

Fillets of plaice may also be served thus. Mix together 3 tablespoonfuls white breadcrumbs, 1 dessertspoonful grated cheese, a finely chopped shallot, and a skinned and mashed tomato. Season them with pepper and salt, add sufficient egg to bind them, and spread the mixture over the fillets. Roll them up, stand them in a buttered tin or pie-dish, and put any of the mixture that remains on top. Cover the fish with a buttered paper, bake it in the oven for 15 min., and when cooked lift it on to a dish, pouring some hot tomato sauce and sprinkling a few browned crumbs over each fillet. See Fish; Food; Forcement; Frying; *Maitre d'Hôtel*.

PLAN: Of a Building. A drawing giving details of construction and arrangement of the parts of some object or piece of work is known as a plan, and refers more particularly to architectural drawings of buildings. Plans of machinery are generally termed working drawings, and similar drawings of boats are called the lines. Plans of buildings are prepared to a uniform scale of ¼ in. to 1 ft. for the general arrangement drawings, the elevation of the exterior and the disposition of the rooms. Drawings on a larger scale of ½ in. to 1 ft. are employed for the purpose of constructional details. See Architecture; House.

PLANES: VARIETIES AND THEIR USES

The Care and Manipulation of these Important Tools

The amateur woodworker may be reminded that this Encyclopedia is full of articles giving detailed directions about making various items of furniture, for many of which a knowledge of planing is essential. In addition there are articles on the various types of plane, e.g. Jack Plane; Ovolo; Plough; Rebate Plane; Router; Smoothing Plane. See further Amateur Carpentry; Tools

The carpenter's plane is used for producing a smooth flat surface on wood. In its simplest form it consists of a steel blade which is passed through a wood or metal block the cutting edge projecting slightly below the bottom. The blade, which is inclined at an angle, is secured in its place with a wedge or some other device, and in the larger varieties a handle is fitted to the tool. In some planes the blade, or plane iron, is single, in others it is composed of two separate portions, the cutting iron and the back or covering iron.

The bottom of the hole where the blade protrudes is known as the mouth, and the upper portion as the throat, and it is important that the mouth should be just wide enough to allow the shavings to come away freely and pass through it, if too wide this will not press down the fibres of the wood in front of the plane iron which consequently will have a tendency to tear the work badly. The principle on which any plane works is that the cutting iron is so ground and sharpened that the shavings are chiselled off with a regular and uniform motion, working with the grain and not against it. The function of the plane is to guide the direction or course of the plane iron and to regulate the depth of the cut. In metal-bodied planes with screw adjustments etc., the principle is the same.

The amateur should possess a jack plane, trying plane, and smoothing plane: with these

the sole, or bottom of the plane. If short, whitish lines are visible, known as medullary rays, these should be as nearly as possible at right angles to the sole of the plane, as such a tool will wear better than one in which these lines are at another angle. If the plane has been made by a reputable maker, it can reasonably be expected to be true and free from warp or twist; but this can generally be told by holding the plane horizontally on a level with the eyes, and looking along the level of the sole. The body of a new wooden plane

should be soaked in raw linseed oil before using it for the first time.

To remove the iron of a jack plane, or trying plane, grasp the plane in the left hand, the thumb pressing upon the iron and the fingers grasping the bottom or sole of the plane. With the aid of a hammer strike a sharp blow near the end of the plane, as in Fig. 1. This will loosen the wedge, which can be withdrawn and the blade lifted out. The two irons are separated by laying them on the bench, holding them firmly in the left hand, and manipulating a screwdriver, as in Fig. 2. The plane iron should rest on or be firmly held by some support such as the bench. When the screw is loose the back iron is slid along the slot cut in the plane iron until the screw is opposite a large diameter hole, when it can be lifted out of its place. The iron is sharpened in the manner described in the articles on Grinding and Oilstone. The cover iron is then replaced; the edge should be about $\frac{1}{8}$ in. or less from the cutting edge of the plane iron. The cover rests upon the front of the plane iron, that is, the side that is not ground.

The blade is replaced and held as if taking the plane apart, while the wedge is tapped lightly in position with a hammer sufficiently to hold the iron. The plane is tilted at an angle, and the edge of the iron will be seen to protrude slightly. If it does not, it may be tapped out gently by tapping the opposite end with the hammer, or be adjusted by the screw device on an iron plane. The iron should project slightly less than $\frac{1}{8}$ in. from the sole of the plane, and should project evenly over the whole breadth of the blade, except the corners, which will be slightly rounded off in the grinding process. The wedge should be secured tightly, and the plane is ready for use.

A smoothing plane is adjusted in the same way, except that to loosen the plane iron, the back of the plane is struck with the hammer

(Fig. 3). In the case of metal planes the various adjusting devices are operated. Fig. 4 shows a metal trying plane with the location and purpose of the various adjustments indicated.

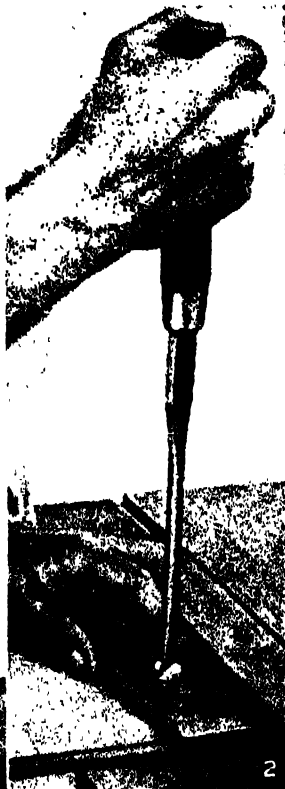
Manipulation of the Tool. Most planes are held and used with both hands; in general, the right hand grasps the handle of the plane, such as a jack plane or the back part of a smaller plane, such as a smoothing plane. Some very small planes may be held in the right hand only; they are used for chamfering the edge or cleaning up any little roughness on the end of a piece of wood, or for work on curved surfaces, but are seldom of use in making a really flat surface. The correct method of using a smoothing plane is illustrated in Fig. 5, which shows the disposition of the hands and the style of shaving that should be produced. Rebate planes and similar planes used for making mouldings are held in the manner indicated in Fig. 6 which shows a filister plane employed making a rebate.

Figs. 7 and 8 show the beginning and ending of a planing movement with a jack plane. The top front of the plane is grasped between the fingers and thumb of the left hand, and the handle held in the right. The object should be to thrust the plane forward in a straight line keeping it level. A tendency to roll the plane may be detected by the tool inclining to lift at one corner, and this may be checked by control with the hands and arms.

If the edge of a board is to be planed, the tool is grasped in a different manner. It may be held as in Fig. 9, the first finger of the right hand being extended as shown, and the left hand resting on the top of the plane. With this grip it is possible to judge whether the plane is being held level or not.

Planing to thicknesses and widths is simply a question of gauging. The principle is to establish a flat surface, or face side, then one edge. These are marked off and gauged to the desired thickness, for which purpose special hardwood gauges can be prepared, or, as in gauging the thickness of a panel, grooves can be ploughed into a small piece of wood, and this is applied to the edge of the panel to correct the planing.

When planing curved surfaces, always work downhill; never attempt to plane uphill against the grain of the wood. When planing



Planes. Fig. 1. How to remove the iron of a jack plane. Fig. 2. Unscrewing the back iron.

three practically any ordinary flat work can be tackled. Other planes that may be added as occasion requires are the rebate, compass, plough, filister, bead, round, and hollow planes, and a variety of various shapes generally used for making different kinds of mouldings; also a small metal block plane and router. When the expense is not too great one of the Stanley universal planes will carry out a wide variety of jobs, including all kinds of moulds, ploughing, tonguing, and grooving. The wooden plane is generally made of beech, which has a close grain and is fairly hard. The purchaser should see that the grain on the end of the plane is as nearly horizontal as possible, or level with



Fig. 3. Loosening the wedge of a smoothing plane.

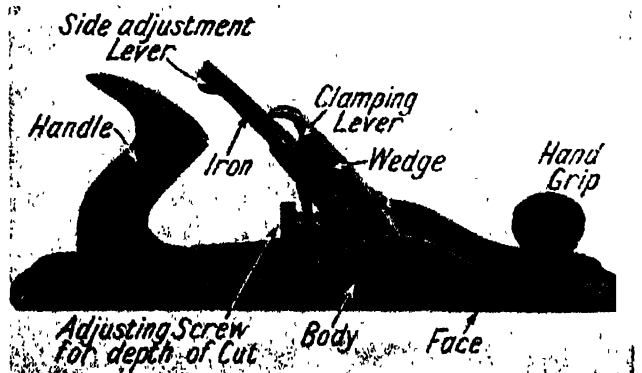


Fig. 4. Typical iron plane with principal parts named.



Plane. Fig. 5. Using a smoothing plane



Fig. 6. Using a filister plane to form a rebate

end grain do not plane straight across the grain, but work from each side across the end grain to the middle, or slightly level one corner of the board, and plane across the end grain to this level, or chop it to an odd piece of wood on the far side of the board, and plane right across. If these precautions are not observed, the wood will split. Another

desirable before using the stuff for anything important. Care should be taken in selecting a plank for conversion, and an end grain showing the heart should be avoided unless several thin boards of narrow width are required. In planning the number of boards the allowance must be made for the thickness of the saw cuts. For example, a 6 in. plank can be sawn into four 1 in. and two 4 in. boards, each being full in thickness.

PLANT. Some authorities define a plant as a living organism, diversified in structure and possessing organs of nutrition and reproduction. The former comprise root, stem, and leaves, functioning for purposes of respiration, circulation and growth. The latter include the flower, with its calyx and corolla, and stamens and anthers, the male organs; pistil, stigma, and ovary, the female organs. Male and female organs may be contained in one flower, or they may be borne on different



and is to hold the plane diagonally, or slanting across the board, but to push the plane bodily in a straight line.

Before attempting to plane wood it is essential that the plane iron is very sharp, and it must be rubbed up on an oilstone when this becomes necessary. For rough work the plane iron should project considerably, for an ordinary cross amount, and for a fine finish the least amount it is possible to set it at. When the plane is cutting properly, the shaving should come away with a clear decided sound.

PLANE: The Tree. The hardy summer-leaving plane tree, ranging in height from 60 ft. to 80 ft., will thrive in the gardens of smoke-laden towns and cities when all other trees fail as the bark is shed annually. Many fine examples are to be seen in London and other English cities. *Platanus acerifolia* (London plane) and orientalis are the chief kinds; they flourish in ordinary soil and may, if it is necessary to keep them within bounds, be pruned hard every few years. They are not, however, suitable for small gardens. The planes can be increased by cuttings set out of doors in late autumn.

PLANK. This is the name given to sawn timber 11 in. or more wide, and from 2½ in. to 6 in. thick, but the word is commonly applied to all sorts of boards. Examples are seen in planks of a platform, in planks used in scaffolding and general building purposes, and in boat building.

For cabinet making it is very often cheaper to purchase a plank and have it sawn into boards, the charge for the saw cuts being a few pence. An objection, however, is that the boards may warp or twist after sawing from the plank, so that a period of seasoning is



Plane. Fig. 7. Start of the stroke with a jack plane
Fig. 8. How the plane is held at the finish of the stroke.
Fig. 9. Shooting the edge of a board with a jack plane

plants—some examples carry male and female flowers separately on the same plant.

PLANTAIN: The Fruit. The plantain is a fruit belonging to the banana family, of which the scientific name is *Musa*. The very large outsize fruits, often attaining a curved length of 8 or 9 in., which are sold in Great Britain as bananas, are really plantains. They may also be distinguished by their thick, tough skins. Real bananas are much smaller, softer, and have thinner, velvety skins. The culture of plantains is as for bananas.

PLANTAIN: A Garden Weed. Two plantains (*Plantago major* and *P. lanceolata*) compel the attention of the gardener because

they are common weeds of the lawn. They spread rapidly by means of self-sown seeds and should be uprooted with a bent-pronged weeding fork while small. A little sulphate of ammonia or lawn sand, if placed on the plantains in settled dry weather, will destroy them. Or they can be killed by means of a special weed eradicator which liberates a supply of weed killer when thrust into the plantains.

PLANTAIN LILY. This group of hardy herbaceous perennials, 2 ft. or so high, is valued for its large ornamental leaves and spikes of small white or lavender coloured lily-like flowers in summer. They flourish either in sunny or partially shaded places in well drained loamy soil and are increased by division in spring. Snails are very fond of the leaves, and if not destroyed often spoil the beauty of the plants. The plantain lilies are first-rate for cultivation in tubs and develop into large handsome plants in a few years, the varieties with coloured leaves are particularly well suited to this purpose. The chief kinds are *Fortunei*, *glauca*, which has grey blue leaves, *Sieboldiana*, and *subcordata*. Two low growing kinds suitable for edging or for cultivation in pots are *lanceifolia* and *tardiflora*.

PLANT HOUSE. A glasshouse built for the cultivation of plants and fruits which are not sufficiently hardy to be grown out of doors or are improved by the shelter thus afforded. The stove or hothouse is for tropical plants; its minimum winter temperature is about 65 degrees. The greenhouse or conservatory artificially warmed to maintain a minimum temperature of about 50 degrees is for the cultivation of half-hardy and sub-tropical plants. In the cold or unheated greenhouse many hardy rock and border plants can be grown in pots, as well as grapes, peaches and tomatoes, either in pots or planted in a border of soil. During the spring and summer months half-hardy flowering plants, e.g. fuchsia, tuberous begonia, zonal geranium and gloxinia, may be grown.

There are two chief types of glasshouses, the span roof and the lean-to, the latter being built against a wall. A garden frame is indispensable to the possessor of a glasshouse; there the plants are propagated and kept until well developed. A pit is a frame or small glasshouse the floor of which is below the ground level; it is often used for the cultivation of melons and cucumbers. Special glasshouses are constructed for the various classes of stove, intermediate and coolhouse orchids. See Greenhouse.

PLANTING. The best times to plant are autumn and spring, the former period being preferable for hardy perennials and leaf losing trees and shrubs. Evergreens may be planted in September, October, or in April and May. Early planting, either in spring or autumn, is sound practice, when preceded by thorough preparation of soil.

The method of making holes just sufficiently large to accommodate cramped roots should be avoided; they must be opened enough to provide ample space, with a little to spare, when roots are spread out horizontally. The value of trenching land before planting is great. See Digging, Mulching, Trenching.

PLANT LICE. The name is applied to the various types of aphids, such as the green fly, which do great harm to all kinds of plants by sucking sap. Infested plants out of doors should be syringed, during a dry evening, with an insecticide, or with a homely remedy made of soft soap and quassia chips in solution. In the greenhouse fumigation with a suitable fumigating compound, such as a nicotine preparation, may be found to be necessary.

The best treatment for apple, plum, and other trees infested with lice is to spray the lower leaf

surface frequently with an insecticide. Certain garden insects, including the ladybird, ichneumon fly, etc., are voracious devourers of plant lice. See Insecticide.

PLAQUE. Ornamental tablets of metal, porcelain, majolica ware, ivory, plaster, marble, etc., usually carved or decorated in some manner, are known as plaques.

With the exception of polychrome enamels, such as the 16th century masterpieces of Limoges, metal plaques are usually wrought in low relief. They may be hammered out in repoussé or cast and chased, as in the case of ormolu or gilt bronze, being sometimes oval portraits in the manner of large medallions, sometimes round or oblong scenes of classical or local interest. If they are of actual value,

as examples of antique work, they should be protected by appropriate glazing.

Ceramic plaques of value usually take the form of old delft, either Dutch or English, of majolica, or the Jasper Ware plaques introduced by Josiah Wedgwood.

PLASHING. This is a method of repairing or confining a hedge by bending shoots towards the roots and cutting the stems half through. In this way the sap is still allowed to circulate, the stems remain alive, and untidy ones become pliable enough to twist among others. Care must be taken that the plashed stems, or branches, are not cut more than half through, otherwise they will die. Proper trimming and attention to hedges in season will generally obviate any necessity for plashing. See Hedge.

PLASTER AND PLASTERING METHODS

The Effective Treatment of Walls and Ceilings

For further details about work of this kind the reader should turn to the article, House See also Ceiling; Cornice; Float; Frieze; Hawk; Lath; Mortar; Partition, etc.

Plaster is the name given to calcareous compounds with a base of calcium sulphate. In the general use of the word, as applied to building operations, it refers to a mixture of lime, sand, and water, generally with the addition of plaster of Paris, or some other material to accelerate its setting. The general use for plaster, as far as the amateur is concerned, will be in the plastering and repair of wall surfaces.

The plaster for a wall is applied in 2 or 3 separate coats. The first, or picking out coat, is applied with coarse stuff composed of a good chalk lime, coarse clean, sharp sand, and clean ox hair. For the mix up the sand is arranged in the form of a hollow basin, preferably rested on boards (Fig. 1), but if the ground is impervious, such as a concrete floor, it can be set direct upon it. The lime should previously have been thoroughly slaked, and is used in the form of a putty with a consistency not unlike that of thick cream.

This is sifted through a sieve, which may be rested upon a couple of poles or boards upon the surface, and water is run through it, if necessary, to ensure that no lumps of the lime are prevented from being mixed with the sand, which should previously have been sifted for a similar reason. The hair, when purchased, is in a clotted state and all lumpy. It is separated by placing some of it on a board and beating it with two sticks, one held in each hand, so as to separate the hairs without breaking them. The hair when beaten is disposed over the slaked lime, and the whole of the sand and lime turned over and thoroughly well mixed with larry and shovel. The mixture should be just wet enough to mix evenly. The larry is a broad bladed tool resembling a hoe. In the blade is a large hole, which aids the mixing of the plaster.

The mass that is thus prepared should be heaped up and left to temper for as long as possible before using. Coarse stuff made in this way can be used at once, but the longer it is left to temper, the more satisfactory the plaster. The usual proportions are 1 of lime, 3 of sand, and 1 lb. of hair for every cubic foot of coarse stuff. The object of mixing the hair is to bind the plaster together and make it more tenacious.

The plasterer's putty or lime-putty referred to

here is prepared from pure chalk lime broken up and placed in a tub with water, and left to slake. The slaked lime is sifted through a very fine sieve into another tub, covered with water, and usually left to mellow for some weeks. The longer it is left, the better it becomes. Fine stuff is composed of lime putty and lime, washed sand, in the proportion of 1 of putty to 2 of sand. The expression gauged stuff is applied to compounds composed of either coarse or fine grain, tuff, mixed with plaster of Paris or some similar material which hastens the setting.

The plaster may be applied to rough brick walls or to a stud partition, built up in timber and lathed over with wooden laths or metal lathing, or even on a backing of coarse canvas strips, cut and nailed to a framework of wood for temporary structures.

Tools for the Amateur. The chief tools used in plastering are illustrated in Fig. 2. The hawk consists of a square piece of board

measuring about 14 in. across, with a small round handle underneath. Stuff that is being applied to the wall or ceiling is conveyed from the mortar board to the hawk and laid on with a trowel. The latter is an oblong tool made of steel, having a handle attached, and is used for applying the first coat of material, known as the coarse stuff. The hand float, similar in shape, but made of wood, is employed for applying the final or setting coat. The scratch consists of 3 or 4 laths nailed together in the form of a fan, the ends being pointed. It is used for scratching over the surface of the second coat, so as to form a key for the succeeding coat.

The gauging trowel resembles the ordinary trowel used by bricklayers, except that it is tapered and does not terminate with a sharp point, but is slightly rounded off. Its use is for mixing small quantities of material, such as putty and plaster. The margin trowel is for work where it would not be possible to use a float. In shape it resembles a small shovel with the sides turned up about $\frac{1}{2}$ in., and is made of steel. The stock brush is for sprinkling small quantities of water on to the work to keep it to working consistency.

There are other tools used by the plasterer which require professional skill and much practice to handle; they are used principally in the formation of mouldings and cornices. For example, the running horse is a tool cut to a particular shape to form a certain section moulding. These tools are generally specially made for the particular job, in conjunction with small moulding tools of different shapes. Another tool is the joint rule (Fig. 3) for working in the angles on cornice work. All these implements may be obtained from any good tool store.

Plastering a Brick Wall. Supposing that a rough brick wall is to be plastered, then the work will be carried out in the following manner: First, with a garden syringe or a bucket and brush, thoroughly wet the bricks. Having placed several buckets full of the coarse stuff on a mortar board in a convenient position, as, for example, on a box adjacent to the wall to be plastered, take a hawk in the left hand and the laying-on trowel in the right hand, and, with a swinging, circular movement apply the plaster to the brickwork, pressing it firmly into contact and making it about $\frac{1}{2}$ in. thick. Fig. 4 illustrates the method of application. Only sufficient of the wall should be covered at a time to permit of convenient working.

The next stage is to take a derby float, and work over the whole surface to flatten and even it. If, however, the wall surface is to be got up in any style, a screed will be necessary. This, in the case of a room having a picture rail and skirting board may be wooden strips about 2 in. wide and $\frac{1}{2}$ in. thick, securely nailed to the wall, and backed up when necessary with rough grounds, so that their surfaces are in line and represent a level surface. A traversing rule or long batten is worked up and down, levelling off the plaster and making its surface uniform with the level of the grounds.

When the plaster begins to set, a wide flat, rough wood float, having a nail driven through it the point of which projects through the face, is applied to the surface of the plaster, producing a series of scratches; this provides a key or hold for the second coat. For all ordinary partitions a second coat may be applied the next day; it may be composed of fine stuff, gauged with a proportion of Keene's cement, or some similar hard, quick-setting material. It is applied with a wooden float, this coat not being so thick as the former.

Fig. 5 shows the mortar board in position in the centre of the room and the second coat course of application. It is brought to a



Plaster. Fig. 1. Preparing the lime plaster in the centre of a crater of sand

true and flat surface by the aid of a traversing rule, with a metal float and a liberal application of water. The great point is to prevent the plaster from setting too quickly, and this can generally be accomplished by moistening the work, and keeping it damp as the job proceeds, both with the first and second coats. All small blemishes are carefully worked out with a laying-on trowel, or hand float, as illustrated in Fig. 6, and the corners finished off. They may

which take the form in general of cast plaster enrichments, the plaster of which they are composed being reinforced with fibrous material, such as hair, coconut fibre, and the like. In many cases canvas is used as a backing, and



Plaster. Fig. 2. Tools which are necessary to the plasterer. Left to right, top: traversing rule, hawk, derby float. Bottom: hand floats, lath hammer, angle float, laying-on trowel, gauging trowel, corner tool. Fig. 3. Jointing rule, used for floating or levelling the surface of plaster in the angle of a room.

ling it flat, true and level with the surface. To ensure a good joint the edges of the old work must be kept saturated with water. On all angles or corners liable to sustain extra wear, the first coating of plaster should be composed of Portland cement and sand in equal proportions. Sometimes in a lath and plaster partition or ceiling the laths are broken, or they fail through age or some defect, in which case all the affected laths should be cut out and replaced by new. The process is described and illustrated under the heading Ceilings.

PLASTER: In Medicine. The value of plasters applied to the skin may depend on the support and protection they give, or on the drugs they contain.

A plaster should not be used indiscriminately for closing skin cuts and slight wounds, as there is always a risk of microbes thus being enclosed in the wound. The wound should first be protected by a thin layer or pad of antiseptic gauze. Strips of plaster should be used with spaces between to allow of the escape of discharges. Plasters are usually so made that the heat of the body melts them sufficiently to allow of them clinging to the skin. See Adhesive Plaster; Corn; Mustard.

PLASTER OF PARIS. Calcium sulphate, known as plaster of Paris, is used for the production of casts of many varieties of small statues and ornaments, for mouldings and interior decorations. It is employed in making casts of parts of the human body, and has

be finished square with the aid of a special trowel virtually having two faces, which work simultaneously at the juncture. A different treatment, and one that is very effective and hygienic, is to cove the corners, that is, round them off, using a wooden float more or less triangular in section, with one of the angles rounded off to the desired curvature. The appearance of such a corner, in course of completion, is illustrated in Fig. 7.

Great care must be taken in reducing the finishing coats to a smooth and level surface in every part. It is important in this connexion to work the first layer as evenly as possible. Equal care should be taken in finishing the arrises, or edges, of projecting corners, particularly the edges of chimney breasts.

Ceilings. Similar methods are employed in the case of ceilings. These are often decorated with applied fibrous plaster ornaments,

thin strips of wood are employed as a reinforcement. These are simply cemented in place with plaster of Paris.

If the cornice is large and consequently too heavy to be made solid, it is usually cast in pieces and then fixed into position. An alternative method is to fix blocks of wood, either triangular in form or of a shape approaching more nearly to the outline of the cornice, so that strips of wood or laths may be nailed on and thus provide a strong foundation for the first layer of coarse work. Full instructions for repairing a damaged ceiling are given in the article on Ceilings (q.v.). Plaster work on walls is liable to sustain damage, in which case any dents or bruises can be filled in with neat plaster or a mixture of lime-putty and plaster of Paris. The general procedure is to hack out the plaster over the damaged area, thoroughly wet it and work in the new plaster with a small trowel.



Fig. 4. Using the laying-on trowel to apply first coat of plaster. Fig. 5. Hand float finishing the coat. Fig. 6. Applying the finishing coat. Fig. 7. Rounding off a corner with a wooden float which is triangular in section with one of its angles suitably curved.

numerous applications in surgery. It is finely ground and is obtainable in several grades, and should invariably be kept in a dry place.

Plaster of Paris has the property of setting into a hard white substance when it is mixed with water. The best proportion to use is water 1 pint to plaster 2 lb. When the plaster sets, it expands slightly.

Plaster figures are made by pouring mixed plaster into moulds. The figures are generally hollow, the residue of plaster from the centre being poured out before it has had time to set. If a small proportion of Portland cement is added to the plaster the time of setting is delayed. The hardness of the plaster is increased by using alum solution instead of water in the mixing process. Plaster of Paris is useful in the household for mending broken tiles and for filling up crevices in walls.

If only a small quantity is wanted, a good plan is to fill a bowl about $\frac{2}{3}$ with cold water and pour in the plaster with a circular motion, distributing it evenly over the water and at the same time stirring with a circular motion, using a wooden spoon or smooth stick. The surface of the water will exhibit air bubbles, and the plaster should be stirred until these bubbles no longer appear. The stirring should be steady, and the water should on no account be violently disturbed, as the air bubbles will be imprisoned and the work will be imperfect. The mixture speedily gets thicker, and if required to be poured into a mould to make a cast, this should be done just as the plaster is in the thickening stage, approaching the consistency of thick cream. If required for moulded work, pour the plaster in steadily so that the air in the mould can escape. See Casting. Modelling.

PLASTIC WOOD. Preparation of sawdust and glue supplied in paste form in a collapsible tube. It is used for filling small holes, crevices, and seams in woodwork, and for covering the heads of countersunk nails and screws. It can be moulded by hand, and modelled with tools, and it dries and hardens in a short time, when it can be planed, chiselled, or sand-papered, and it will take stain or polish. Plastic wood should be allowed to dry at normal room temperature, as the application of heat for quick drying causes it to crack and shrink. It is inadvisable to use it for stopping large holes, because of its liability to shrink, even when drying at normal temperature, and to counteract this as far as possible a surplus should be left above the surface level of the hole, and the surplus sandpapered off when dry.

For stopping large holes, filler should be used. This is a fine sawdust in a cement base, and is supplied as a paste or a powder. The latter is mixed to a paste with water before use. When dried naturally, filler does not shrink or crack, and can be worked like wood.

PLASTICS. General name for synthetic materials used in place of wood, metal, pottery, and fabrics. One of the commonest type belongs to the phenol-formaldehyde group, and in its original form is a dry powder. It is placed in a mould of the article to be made and a pressure of 2,000 lb. per sq. in. applied at a temperature of 300° F. When the pressure is released, the article is removed and polished.

Plastics are marketed under a number of proprietary names, and are of wide application in the mechanical, electrical, radio, gramophone, aeroplane, automobile, building, paint and varnish industries, and have manifold domestic uses. Plain or coloured plastic plates, cups, and saucers are obtainable. A form of pliable plastic fabric is used in the making of handbags, upholstery, curtains, waterproofs, etc. Plastic materials, except celluloid, are non-inflammable, and so are used for ashtrays, and fireproof cooking dishes.

Other familiar plastics are vulcanite (rubber hardened with sulphur), and crinoid, made from casein and used for making knitting needles. Plastic articles are easily cleaned, only requiring rubbing with a damp cloth; they should not be soaked in boiling water, as this tends to distort them. Plastic plates, cups, and saucers are acid-resistant and do not stain if thoroughly washed after use.

PLATE WARMER. Any apparatus for heating plates or dishes. A type used mainly in large establishments somewhat resembles a miniature oven, with separate shelves for plates, vegetable, and meat dishes.

The iron rack above the domestic stove serves as an efficient plate warmer, the dishes being left there while the meal is being prepared. A small metal standard plate rack is useful for this purpose, and it accommodates a number of plates. Electric warming plates can be obtained in various sizes, fitted with flexible cable and wall plug.

PLATE: In Photography. A plate is a piece of thin glass of standard size coated with light-sensitive emulsion for exposure to light in a camera. After exposure and development plates are called negatives. When the sensitive emulsion is coated on a celluloid support the combination is known as a film.

There is a somewhat greater variety of glass plates than of films, both in the matter of speed or degree of sensitivity to light, and of the kinds of emulsion used. For this reason many amateur and professional photographers prefer glass plates to films, in spite of their greater weight and bulk. Nevertheless the use of flat films in addition to roll films has so increased that one company, the Kodak Co., has abandoned the manufacture of glass plates.

Varieties of Plates. The varieties of plates which are of use to the amateur are stated in the following paragraphs.

Ordinary plates made under this title by most plate manufacturers are coated with plain emulsion and moderate in speed, and are very suitable for all-round amateur work if sufficient exposure can be given. They have a finer grain than faster plates, and therefore give good contrast and make excellent enlargements and lantern slides. They are not fast enough for snapshot work. Orthochromatic or panchromatic emulsions include dyes that give more accurate response to colour values than the plain emulsions.

The plate sold as ordinary has generally a speed of about 70 H. and D. (Hunter and Driffield system). Other ordinary plates, i.e. with plain emulsion, but of higher speeds, are sold under such names as Special Rapid, Rapid Chromatic, Self-screen and Super-speed Ortho.; Soft, Special Rapid and Hyper. Panchromatic, etc., and have H. and D. speeds of 270-300, 400-550, 700, 1200, up to 2500. Unfortunately there are different systems of calculating plate speeds, and great difficulty in obtaining results which are scientifically consistent. Thus a batch of plates marked 200 H. and D. by one maker is not necessarily of the same speed as another maker's plates also marked 200 H. and D. This is the principal reason why the amateur is always advised to keep to the brand of plate whose qualities in working he knows by experience.

A speed number is not a reliable indication of the quality of a plate. As a general rule medium speed plates are more likely to be of high quality than very fast ones, although some of the most rapid plates give very good results. Experience can be the only guide in the choice of a plate, but for general use an extremely fast plate should be avoided. The slower plates have thicker emulsions than the faster, and are therefore freer from liability to fog, give better contrasts, and a wider range of tones. The faster plates have much thinner emulsions, and there is consequently greater

difficulty in manufacture to ensure freedom from fog, and to avoid halation owing to the surface of the glass support being nearer the surface of the film. Fog is due to scattering of light over the sensitive surface of the plate with the result that a general greyness is observed in the negative which consequently gives a somewhat flat, grey print.

Many plates are now available designed to overcome halation troubles. One method is to coat the back of a plate with a black non-reflecting substance, such as caramel. These plates are sold as backed plates. Another is to coat the plate with a matt emulsion. When developed, the negative has the appearance of being coated upon finely ground glass. For interiors with window lighting, light coming through tree foliage, polished metal articles, and similar subjects which cannot be satisfactorily reproduced on ordinary plates on account of halation, these plates are very useful. Other anti-halation plates are available in which a special light-absorbing coating is placed between the emulsion and the glass plate.

For amateur purposes the sizes of plates best suited are the $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in., the $\frac{1}{2}$ plate, and the $\frac{1}{4}$ plate, the favourite being the $\frac{1}{4}$ plate. A better-shaped plate for general use, particularly for landscape work, is the standard continental plate, 9 cm. by 12 cm., or about $3\frac{1}{2}$ in. by $4\frac{1}{2}$ in. The following are standard British and continental sizes.

STANDARD SIZES OF PLATES

Name	Size	Diagonal
—	$2\frac{1}{2}$ in. \times $1\frac{1}{2}$ in.	3 in.
—	$3\frac{1}{2}$ in. \times $2\frac{1}{2}$ in.	4 in.
Lantern plate	$3\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.	4 in.
$\frac{1}{4}$ -plate	$4\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.	5 in.
Continental equivalent of $\frac{1}{4}$ -plate	9 cm. \times 12 cm.	—
—	$3\frac{1}{2}$ in. \times $4\frac{1}{2}$ in.	5 in.
Postcard	5 in. \times 4 in.	6 in.
—	$5\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.	6 in.
—	6 in. \times $4\frac{1}{2}$ in.	7 in.
$\frac{1}{2}$ -plate	6 in. \times $4\frac{1}{2}$ in.	8 in.
Stereoscopic	6 in. \times $4\frac{1}{2}$ in.	7 in.
Whole plate	8 in. \times 6 in.	10 in.
—	10 in. \times 8 in.	—
—	12 in. \times 10 in.	—
—	15 in. \times 12 in.	—
—	18 in. \times 12 in.	—

The diagonals given in the above table serve as a guide to the size of condenser required if the plates are to be used in an enlarging lantern. All the sizes given are also standard sizes for bromide and gaslight papers and the sizes up to whole plate for P.O.P. See Developing; Film; Negative; Panchromatic.

PLATE GLASS. In the processes of its manufacture plate glass is finished with a flat and true surface, and, being transparent and free from irregularities or surface markings, it is used for good-class windows. In the home plate glass is also used as a protective covering for washstands and the tops of tables. The surface is easily kept clean, and decorative material can be placed beneath the glass to add colour to the room. In the same way a well-polished piece of furniture or tray can be protected, and the grain and colour of the wood revealed.

Another application of plate glass in the home is as shelves in the bathroom, or for pastry making in the kitchen. Shelves should have rounded and polished edges, and they are generally supported by electro-plated wall brackets.

Plate glass can be purchased from builders' merchants or first-class ironmongers, and has to be cut to size by the manufacturers. In ordering it is well to give the exact dimensions, or a full-size pattern of the piece required. The thinnest plate glass measures $\frac{1}{8}$ in. thick. A useful thickness is $\frac{1}{4}$ in., and this will generally be supplied if no thickness is mentioned at the time of ordering. See Glass.

PLATE MARK. Articles of gold and silver plate are marked with a set of symbols by certain recognized guilds or assay offices in the

United Kingdom, as a guarantee that the metal is of standard purity, and also to indicate the date. These hall-marks on plate are a greater safeguard than potters' marks on china, and are always taken into account by collectors. They have no relation to the artistic merits of the plate.

From 1784 to 1890 in Great Britain, and from 1807 to 1890 in Ireland, the sovereign's head was punched on all plate to denote that duty had been paid. The duty marks of the three kings faced to the right, Queen Victoria's to the left. Duty-free pieces, intended for export, were identified by a figure of Britannia to prevent their being sent out of the country duty free and then immediately brought back again. In 1876 all imported plate marked at an English office was required to bear the letter F, to indicate its foreign origin. In 1906 distinctive symbols for imported plate were prescribed, such as the constellation Leo for London, of Libra for Sheffield, and a triangle for Birmingham. No Silver.

PLATINUM: The Metal. Of whitish-grey colour, platinum is generally to be found in the native state, although it may be alloyed with other platinum minerals. It is used extensively for the manufacture of jewelry and objects of art, for various dental and medical appliances, and for several forms of chemical crucibles. Owing to the fact that platinum has nearly the same expansion rate as glass, it is employed in making many forms of electrical contact points and connexions for lamps and other fittings, especially where the conductor has to pass through the glass.

Platinum is used in jewelry chiefly as a setting for diamonds. On account of the high cost of this metal, such a setting is usually backed with gold. Platinum needles, or points, as they are called, form a part of every pokerwork outfit, and their uses in this connexion are described under the heading Pokerwork.

PLATYCERUM. This plant, which is commonly known as the elk's-horn fern, is epiphytic in form and prettily provides its own nourishment. Its horn-shaped fronds are fertile, but in addition to these it throws up flat, broad, barren fronds, which spread upon the surface of these decay, and provide a substance upon which the plant survives.

Plants are best arranged upon blocks of wood, covering their roots with peat and moss, and binding the whole firmly with copper wire. Thus prepared they may be suspended from the roof or other parts of a warm-shaded greenhouse, keeping them moist at all times, and top-dressing every year with peat and fresh moss. Propagation is by offsets, with rootlets, thrown off at the base of the plant, and planted during March.

PLATYSTEMON. The common name of Californian poppy (*q.v.*) is applied to the hardy annual, *Platystemon californicus*, and to various other flowers. The *platystemon*, which is raised from seeds sown out of doors in April where the plants are to bloom in summer, grows from 10 to 12 in. high, has grey-green leaves and bears pale yellow poppy-like flowers.

PLAY and GAMES. Play is as important to a child as school-work, for it is an essential part of his physical and mental growth. The child becomes what he is as a result of what he does. No child can refuse to play and still develop a well-balanced character. Playing games is an instinct, having been handed down through unnumbered ages. The play instinct is fostered by the establishment of school playgrounds and recreation centres, under the supervision of trained instructors, who teach what games to play and how to play them. But all alert children quickly invent games of their own on far more individualistic and realistic lines, and these games are most valuable of all to the young mind, since they are so highly imaginative. The intensity of the child imagination is often

not fully realized. The child who imagines that his scooter is a high-powered express locomotive, and "plays trains" accordingly, is actually living temporarily in the world of his imagination. Many parents make the mistake of thinking that a child is "lying," when he is merely acting a part in some imaginative game of his own devising.

Nevertheless, organized games have a more disciplinary value for both mind and body. No brain can work properly without the nourishment of strong blood. No virile thoughts can come from a brain fed by organs neglected throughout life. It is a child's right to have ambition to be a leader, and we do not accord him his privilege if we withhold the opportunity to build a body that will make his brain active. The following games are of value in bringing out that desirable idea of leadership and self-reliance in the child, and in developing the qualities of fair play, mental alertness and physical strength. Other such games will be found throughout this Encyclopedia.



Platycerium, or elk's-horn fern, a greenhouse fern with curiously shaped leaves

For Younger Children. Follow my leader" is for any number of players. One player, who is specially resourceful or skilful, is chosen as leader. The others all form in a single file behind him, and imitate anything that he does. The leader aims at making these tasks as difficult and unexpected as possible. Anyone failing to perform the required feat drops out of the game, or goes to the foot of the line, or pays a forfeit (*q.v.*).

"Cat and Rat" is a game for 10 to 30 or more players. One player is chosen for the cat and another for the rat. The others form a circle by clasping hands. The cat is outside the circle, the rat inside. The cat says, "I am the cat." The rat says, "I am the rat." The cat says, "I will catch you!" The rat says, "You can't!" This remark of defiance starts the chase. The rat is assisted by the players, who raise their hands to let him through, but the cat is prevented by the player who try to keep him on the opposite side of the circle. When the rat is caught, he joins the circle. The cat becomes the rat, and a new cat is chosen.

For Older Children. "Twos and Threes" is simply an elaboration of the old-fashioned Touch (*q.v.*). The players, grouped in couples (one player behind another), form a large circle, facing in. One player is selected as a runner, and another as "he," or the chaser. The chaser attempts to touch the runner, who tries to escape by dodging round out of the circle. The runner being chased eventually stands in front of any couple,

making "three deep." This crowds off the rear player of the original couple. He immediately becomes the runner and is chased until caught, or until he saves himself by standing in front of another couple, making it "three-deep" and crowding off another player. When the chaser catches a runner, the positions are reversed. This is a game that gives every player a chance, whether fleet of foot or not. The uncertainty and rapid changes keep everyone alert.

"Pass in the Corner," "Turn the Trencher" (*q.v.*), and "Frog in the Middle," are other well-known games of this class. They will also be found useful as indoor games for rainy days or for children's parties. Most of the oldest and most popular games did not originate as mere games, but have come down to us as survivals of tragic or comic or exciting events in history and folklore. They spread from country to country, with changes of name. Politics, religion, mythology, folk tales, folk customs, common occupations, have all given rise to games which have spread abroad.

PLAYER PIANO. The terms player piano and piano player are often used as if they were synonymous, which is not the case. When the idea of playing the piano by means of a mechanical adjunct first became practicable, it took the form of a cabinet containing the mechanism, which was moved to and from the piano as required. This was the piano player. It had drawbacks in the way of adjustment, which inventors overcame by finding room for the mechanism in the body of the piano, thus making the adjustment invariable. This is the player piano. Apart from certain differences connected with the altered positions, the principles of construction and management are the same.

The Mechanism. The principle of the player is pneumatic. The motive power is supplied by a pair of treadles like those of the harmonium, which tilt the bellows, the action being made to operate on the keys of the pianoforte. The notation for the player piano consists of a roll of paper having perforations in it. This roll is attached to the spool, and when the treadles are worked it unwinds and passes over a tracker bar pierced with 85 or 88 holes, corresponding to the notes of the ordinary or the extra compass pianoforte. When a hole in the roll coincides with a hole in the tracker bar, the note on the piano corresponding to it is made to sound.

Below the keys are 6 or more levers, or sometimes buttons, for various purposes: rolling and re-rolling the music; controlling the tempo; lessening the tone on either or both halves of the compass; and working the pedals of the piano; to which may be added one for controlling the melody.

The player piano is an ingenious device for rendering pianoforte music without the aid of fingers (*m. a. pianistic sense*), but there is, however, not only ample scope, but an absolute necessity, for individuality on the part of the operator if the effect is to be musically satisfactory. The player piano has to be studied just the same as any other instrument, and the first thing to be learned is how to use the treadles, for on this depends the various degrees of tone from pianissimo to fortissimo.

The possessor of a player piano should always buy good rolls, not only as to the music cut on them, but also as to the quality of paper, for if this be poor and soft it will take up moisture from the air, swelling to such an extent that exact tracking and accurate playing will be out of the question. The roll can be dried, but it is better to buy the best only. It is cheapest in the long run, as with careful use a roll should last a long time. In buying a second-hand instrument it is best to get someone who understands players to test it thoroughly before clinching the bargain. See Piano.

PLAY PEN: How to Construct. Suitable either for in or out of doors, a play pen is useful for assisting a baby to walk. For convenience in carrying it about, the pen should fold up in a small space, and, although it should be strong and rigid, the method of construction must allow of the use of comparatively thin material.

The play pen illustrated in Fig. 1 has 2 long and 2 shorter sides, the latter being hinged together in the centre and also hinged at each end to the long sides, so that they fold inwards and allow the sides to close up. First prepare four 48 in. lengths of birch or white-wood to $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in., and, if the material is purchased especially for the purpose from a lumber yard, order some 2 in. by $1\frac{1}{2}$ in. material to be machine planed on all sides which will bring it to the approximate size. In addition, about 53 lengths of $\frac{3}{8}$ in. birch dowels, 24 in. long, and another 12 ft. of the $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. wood will be sufficient.

Place 2 of the 48 in. lengths together, and, beginning at the centre, set off $1\frac{1}{2}$ in. each side, and follow with 3 in. marks across the edges, making 16 marks in all and leaving a $1\frac{1}{2}$ in. space at each end. Draw a line along the centre of the whole length and bore centre or twist bit holes to a depth of $\frac{3}{4}$ in., but first make sure, by testing, that the hole is a tight fit for the dowels. The total height of the pen is to be 24 in. over all, so that the depth of holes and length of rods must be carefully gauged throughout the job. On the remaining 2 lengths, draw a line along the centre. Place them together, and this time commence marking 3 in. spaces $7\frac{1}{2}$ in. from the centre, which will give 12 centre marks for the holes. In one length, which will be the bottom one, set out 2 marks 4 in. from the centre; the corresponding space in the top piece is left plain. Bore holes as before. Then plane off the corners of top lengths and at top of bottom lengths, round the ends and finish quite smooth. The 2 lengths with the 16 holes are now glued up, the dowels being cut off to 21 $\frac{1}{2}$ inches.

The section at Fig. 2 shows the shape of the top pieces with the dowels in position. When the round rods of the other long side are in position, there will be a space of 15 in. between the 2 inner ones; this is to allow for the bead frame. The method of making this part is to trim the ends of a 15 $\frac{1}{2}$ in. length of dowel for the horizontal piece, A, as in the section at Fig. 3, and three 11 $\frac{1}{2}$ in. lengths for the vertical rods at B. Holes of $\frac{1}{4}$ in. diameter and $\frac{3}{4}$ in. deep are bored in the 2 up rights 11 $\frac{1}{2}$ in. up, and others corresponding to those at the bottom in the horizontal length, and the trimmed ends of rods fitted in.

Three 15 $\frac{1}{2}$ in. lengths of $\frac{3}{8}$ in. brass rod are next fitted in the upper part of the inner uprights as at C, Fig. 3, and 18 coloured glass or wooden beads threaded on, 8 on the top 6 on the centre and 4 on the lower rod. The side can now be glued up, provided all corners have been rounded and smoothed with glass paper.

An alternative method of securing the short lengths of dowel is to file a hollow on the ends and screw them together as in Fig. 4. Instead of using round wood for the uprights and centre bar $1\frac{1}{2}$ in. square wood can be mortised and tenoned together.

For the ends, cut off 8 lengths of 16 $\frac{1}{2}$ in. by $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. wood,

place them together, and set off 3 in. marks from one end; these will fit next the side. Draw centre lines and bore the holes for the dowels as before, each length having five holes. Round the top lengths to match those of the sides as shown in the section at Fig. 2, and take the corners off the underside and on top of the bottom lengths. Dowels can then be fitted and glued to give a total height of 24 in., as with the sides.

Before the corners are hinged together, as at Fig. 5, with $1\frac{1}{2}$ in. by 1 in. back flap hinges, the 2 halves of the ends are hinged with similar hinges on the outside as shown in Fig. 6. In addition to the hinges, it is necessary to fit locking plates on the top bars; these are made from sheet iron or brass 5 in. by 1 in. by $\frac{1}{4}$ or $\frac{3}{8}$ in.

The screw holes are drilled at one end, and a $\frac{1}{4}$ in. bolt soldered to the other through a hole drilled $\frac{1}{2}$ in. from the end, the end of the plate being rounded as in Fig. 7. The plate is screwed to one half of the rail, and the bolt fits in a hole in the opposite half, being held by a wing nut as in Fig. 8. The centre of the hole should be accurately marked from the plate and bored right through the top rail, but to allow the bolt to enter, the wood is cut away with a chisel at a slant on the inner edge of the hole, as shown in Fig. 9.

In order to prevent the loss of the wing bolts a groove should be filed round each, and a length of brass wire with an attached loop fitted on, the ends being soldered so that it will move but not slip off. A length of chain is attached to the loop, as in Fig. 10.

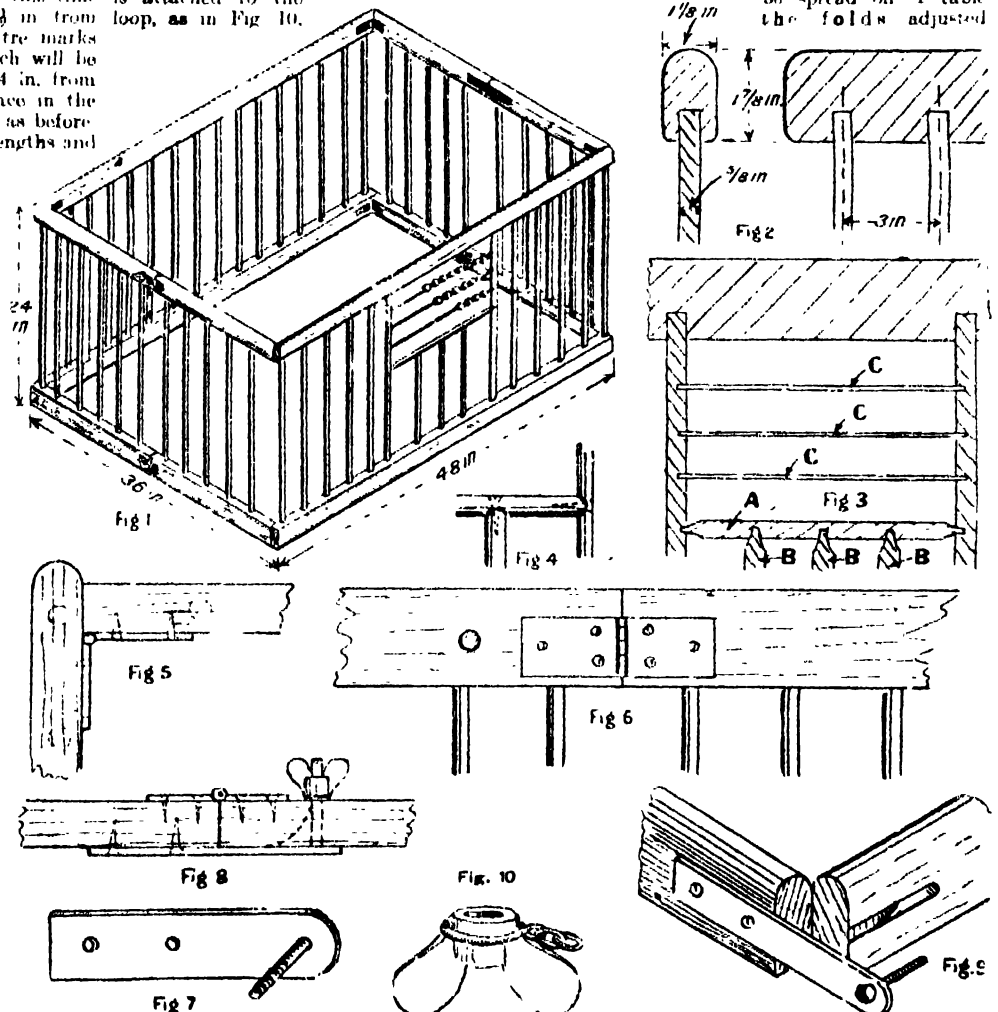
and fastened to the top rail. The woodwork if quite smooth should be sized and varnished, or it may be enamelled white. The metal fittings, with the exception of the rods in the bead frame, should be coated with black enamel, but care must be taken that the rough edges of the hinges and locking plates are taken off with a file and smoothed up with emery cloth. See Baby Nursery.

PLEATING. One or more folds of material pressed flat and held in usually at the upper end only, allowing the lower one to open and give extra fullness when required, is called pleating. The arrangement of folds to form pleating is used extensively in dress-making.

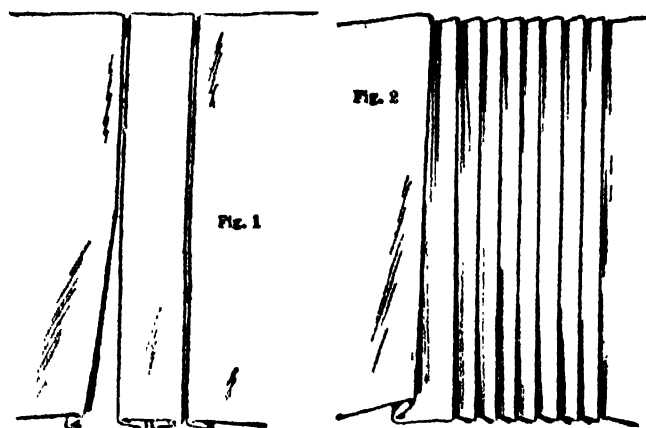
Different kinds of pleating are suited to heavy or light materials. Kilted and box pleating are generally employed for the former, while a finely woven material should be chosen for accordion pleating, as otherwise it is difficult to keep the pleats in place.

Inverted pleats or box pleats are made as shown in Fig. 1, quite close together. In the case of pleating for a skirt a piece of binding or tape is usually placed at intervals of about 6 in. across the inner side of the pleats and tacked to each one to prevent them opening and coming out of shape. Crêpe-de-Chine, georgette, or any light woollen fabric can be accordion or knife pleated with success. Accordion pleats are rather difficult to keep in place. Knife pleats (Fig. 2) may be tacked into position and pressed flat.

Pressing the Pleats. When pleats become creased or lose their shape, the garment should be spread on a table the folds adjusted



Play Pen. Fig. 1. Folding play pen with two long and two short sides. Fig. 2. Shape of top with uprights in position. Fig. 3. Section showing bead rods and method of securing uprights and rail. Fig. 4. Alternative method of fastening uprights and rail. Fig. 5. Top view of hinge at corner. Fig. 6. Front view of hinge at end. Figs. 7, 8 and 9. Method of making and fitting locking plate. Fig. 10. Wing nut with wire chain fastening.



Pleating. Fig. 1. Inverted and box pleating. Fig. 2. Knife pleating.

tacked into place, and the whole covered with a clean, damp cloth. Press this heavily and evenly with a hot iron until it is dry and the steam ceases to rise, and the pleats will then be found neatly pressed. If the pleats are many, the process should be done in stages, two or three pleats being pressed at a time. The iron should not be too hot, otherwise the covering cloth may be dried before the pressing is finished, or the garment beneath may be badly singed. If the result is not satisfactory, the cloth may be dampened again and the process repeated. Box pleats are the easiest to press, but the liner kinds and sunray pleating, in which the pleating widens towards the base of the garment, need to be arranged skilfully, and in a great number of cases are best sent away for professional treatment.

Planted trifling in net union, and voile becomes limp and shapeless when washed, and requires special skill in ironing to restore the original pleats. Some of the laundries specialize in dealing with pleated and trifled garments and return them in an almost new condition. See Box Pleat.

PLEIONE. To day classified as *Coelogyne* by botanists, this genus of orchids includes some very pretty species. One of the best for cultivation in a cool greenhouse is *maculata*; its flowers are fairly large, with attractive markings of yellow and crimson upon white, and these are borne in autumn, appearing while the plants are leafless. See Orchid.

PLEURISY. Pleurisy, or inflammation of the pleurae, the membranes which line the chest cavity and cover the lungs, often follows a chill, but this is only a predisposing cause. The active agent is the germ of such diseases as diphtheria, typhoid fever, pneumonia, and especially tuberculosis. The attack may be of the dry type, or fluid may accumulate in the pleural cavity.

In dry pleurisy a severe cutting, stabbing stitch is felt under the armpit or around the nipple, but it may be above the collar bone or on the abdomen. Any movement of the chest greatly increases the pain. Vibration may be felt when the hand is laid on the chest. The patient lies on his back, or very often on the healthy side, because pressure on the affected side causes pain; when the pleura becomes filled with fluid he usually lies on the affected side so as to have full use of the healthy side.

Pleurisy with effusion, being commonly caused by the tubercle bacillus, is often followed by tuberculosis of the lungs. If much fluid fills the pleural sac it may cause bulging of the spaces between the ribs, and the heart and the abdominal organs may be displaced.

In the dry stage, the chief aim of treatment is to relieve pain. For this purpose, apply linseed meal poultices, hot fomentations, turpentine stupes, or a mustard poultice. In the effusion stage the affected side is often

at a mountain resort is very beneficial in most cases. See Lung.

PLIERS. Of the several patterns of this tool there are three that should be in every amateur's tool kit. These are: side cutting, gas, and round-nosed pliers. The first, generally made with flat jaws and with cutting edges at the sides, are used for snipping off wire. Gas pliers, made with serrated, circular, internal jaws, are for gripping pipes and rods. Round-nosed pliers with tapered jaws are indispensable for forming eyes at the end of wire and for other purposes, such as bending wire and thin sheet metal.

Electricians' pliers are made with heavily insulated handles. Small flat-nosed pliers are handy for bending thin metal. Cone pliers, which resemble gas pliers, are used for tightening cones on a bicycle.

PLIMSOLL. This is a shoe consisting of a canvas upper and a rubber sole. The rubber sole, which is flexible and fairly thin, is carried over the lower edge of the upper, to which it is secured by rubber adhesive. Plimsolls have no heels, and are specially suitable for beach and gymnastic wear.

If the edge of the rubber sole comes away from the canvas upper, it can be secured again by application of the solution used for repairing the inner tubes of tyres. A disadvantage of the plimsoll is that when the sole wears out the whole shoe must be discarded, because a new rubber sole cannot be attached to an old upper.

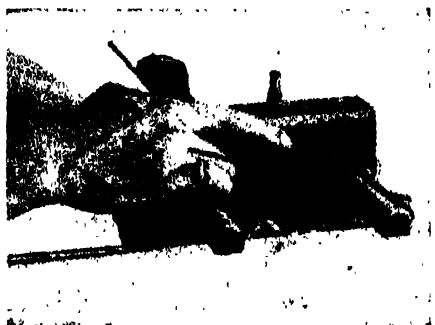
There are plastic plimsolls which have neither seams nor joints, the sole and upper being formed in a single piece.

PLOUGH: The Plane. A plough is a woodworking plane designed to make a groove on the face of a board parallel to an edge. The hardwood body of the plane is furnished with a steel sheet, or blade, projecting down-

ward, which is divided so that the cutter, or iron, can pass through; the blade is thinner than the width of the narrowest iron to be used. Two bars pass transversely through the body of the plane, and carry a hardwood block, or fence adapted to bear against the edge of the board.

In use the bars are pushed through the plane body and locked by wedges, so that the distance from the centre of the iron to the face of the fence is equal to the required distance from the centre of the groove to the edge of the board. The width of groove depends on the size of the iron chosen. The amount cut at each stroke is regulated by the amount that the edge of the cutter projects below the bottom of the blade; the iron is locked by a wedge after being adjusted as required. The total depth to which the groove is ploughed out is regulated by an adjustable stop below the plane body.

The tool is pushed along the work repeatedly till it reaches the required depth, when it



Plough Plane. Regular type in use on a board, showing how the tool cuts a groove.

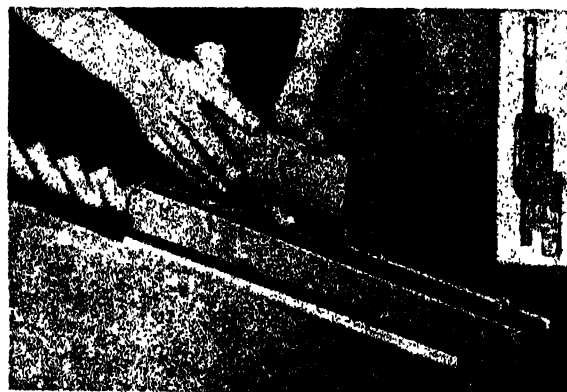
ceases to cut owing to the operation of the stop. While cutting is in progress the fence is kept up against the edge of the work so that the groove comes in the right place. The tool must be so held during the cutting process that it is kept level laterally. Two useful types are illustrated. See Plane.

PLOVER. Plovers are almost invariably roasted, the directions being the same as those given for roasting game. While cooking, they must be kept well basted, otherwise they will be found too dry. They may be drawn or left undrawn, but whatever the method adopted, the livers must be left inside. The time required for cooking is about 20 min., and the bird should be served on small rounds of fried bread. Garnish with watercress and cut lemon.

Plovers' Eggs. The eggs are of a rich flavour, and are regarded as a delicacy. Though sometimes eaten hot, they are better cold, and, after being hard boiled, should be left in cold water until they are to be served.

They may be served on small rounds of bread and butter, and garnished with cress or salad and maître d'hôtel butter. If the eggs are preferred hot, they should be re-heated in some suitable sauce and served in it. See Game.

PLUG: In the Wall. Before any fitting can be attached to a brick, breeze block, or plaster wall, holes must be made to take plugs in which the nails or screws can be driven home. For many of the jobs about the home the patent fibrous plugs offer the most convenient means of doing this. The plug consists of a short piece of specially prepared fibrous material, through the centre of which is a



Plough Plane. Simple type used for making a groove to take a 1/2 in. plywood. Inset, right, sectional view of the plane. Courtesy of Handicrafts, Ltd.

small hole. In the material in which the screw is to be inserted a suitably sized hole is made with a drill or jumper, the plug pushed into it, and the screw driven into the plug. The effect is to cause the fibre to open and expand, thereby firmly gripping the walls of the hole in the walls, etc. The plug can be applied to brickwork, stone, or plaster, and is a practical means of fixing a great number of articles in the home.

Some care is needed in making the hole. A jumper of the proper size for the plug should be employed, and the latter must be the one intended to be used for the particular gauge of screw employed. Do not attempt to drive the tool straight into the wall, or the outside edges of the wall will probably be cracked and break off, leaving an unsightly mark. Hold the jumper lightly in the left hand and strike the tool a series of sharp, light taps, slightly turning the tool in the hole after each tap. In this way a perfectly round hole can be formed in the wall without damage. The tool should not be forced, and it should be held straight out from the wall, or perpendicular to it, as in Fig. 1.

Having prepared the hole to a depth suited to the screw, a plug of the required length is inserted in the hole, so that the end is flush with the wall surface. The length of the hole, and consequently the plug, will vary with the article to be fixed. Suppose, for instance, the fitting is $\frac{1}{2}$ in. thick. If the article were not very heavy, a $\frac{1}{4}$ in. screw would probably be sufficient, leaving 1 in. of the screw to fit into the hole in the wall. In this case a plug 1 in. long, fitted into a hole about the same depth, or slightly more, would be needed. The next step is to insert the screw through a suitable hole drilled through the article, and into the hollow centre of the plug fitted into the hole in the wall. The screw should then be screwed up tightly with the aid of a suitable screwdriver.

The holes for a nail or other like article should be bored in the wood and the positions of the holes carefully marked on the wall. The plug holes must coincide exactly with these, and the screws must enter the plugs accurately, centre to centre, or the plug may split. The screw must be of such a length that it can be driven home, and thus hold the



Plug. Fig. 1. Making hole for fibre plug with borer. Fig. 2. Inserting fibre plug into hole made in plastered wall. Fig. 3. Showing how screw enters the hollow centre of the plug.

intruent tightly to the wall, without the unthreaded portion reaching the plug. If the screw is too long for the plug, so that the unthreaded portion reaches the latter, further attempts to screw it home will result in the plug being loosened.

For such hard materials as marble, concrete, slate, and the like, it is better to use a plug slightly

bricks are visible it is generally possible to cut out the mortar. Prepare a hardwood plug equal in width to that of the hole and about 3 in. long, and drive it into the joint along the way of the grain, so that the end grain is facing out of the hole. The wood should be tapered, and is driven in tightly with a hammer. The joint may then be made with neat cement.

If it is necessary to place the plug in the brick itself, or in a plastered brick wall when the joints of the bricks are not visible, the hole must first be chipped out with a cold chisel, or brick borer, as illustrated in Fig. 4. The rough hole thus formed is drilled out smooth, and a softwood plug driven into the brickwork, as in Fig. 5. If the plug is made to proper length, which is slightly less than the depth of the hole, it will only have to be driven in flush with the wall otherwise the protruding end may be sawn off with a hand saw, interposing a piece of zinc between the side of the saw and the wall to prevent scratching the latter.

In plugging a concrete wall it is necessary to chip out a hole in the concrete, making the hole wider at the bottom than at the mouth. The plug should be split at the top and provided with a wooden wedge, which is first

shorter in length than the screw, and to drive the plug in so that it is below the surface of the wall. This prevents the unthreaded portion of the screw from entering the hollow of the plug, and thus facilitates the screwing-up operation. An alternative is to use screws which are threaded right up to the head, when the plug can be fitted flush to the surface of the wall as usual. This type of screw is required in fixing thin metal fittings, such as brackets, mirror plates, and hangers.

It is often necessary to plug a brick wall to provide a fixing for rough grounds, heavy shelves, etc. Where the joints between the

placed in the hole, the plug is then introduced so that the wedge goes into the slot, and the whole is driven into place. The wedge will expand the wood plug at the back and cause it to grip the concrete. As an extra precaution, the hole may be loaded with plaster or, preferably, cement, before driving the plug in, so that every crevice is filled with cement.

When making holes in walls for plugs, care must be taken to avoid gas and water pipes, or the casings of electric light cables that may be embedded in the plaster work. When plugging into brickwork, especially near the fireplace, the hole must not go too near a flue, or the plug may take fire. See Gas.

PLUMS: THE GARDEN VARIETIES

The Growing and Cooking of a Delicious and Serviceable Fruit

This article deals firstly with the growing of plums and with keeping the trees free from insect pests. This is followed by entries that describe the making of various plum dishes. See further Fruit; Grafting; Pruning; the articles on other popular fruits, e.g. Apple; Cherry; Pear; also Bottling; Bullace; Cordon; Espaller; Greengage; Jam; Silver Leaf; Spraying, etc.

The plum is one of the most useful of late summer and early autumn fruits, and if correctly managed will yield satisfactory crops unless climatic conditions are very unfavourable when the trees are in blossom in spring. Many of the dessert plums are self sterile, and unless other varieties are planted near them they will not bear fruits freely. A mixed plantation is indispensable to success.

Plum trees may be grown in the open garden in the form of bushes or standards, or as trained trees on walls; they are also grown as cordons, but are not so suitable for this method of training as apples and pears.

During the first few years after planting plum trees usually grow very vigorously but bear little fruit. Orchard standards, which eventually form large trees, must be allowed to grow freely and much fruit cannot be expected from them for several years. But by correct management bush and trained trees can be made to yield in their early years.

Plum trees thrive best in well-drained loamy soil, especially that which overlies chalk. In preparing sites on clayey land the sub soil should be broken up to provide drainage, mortar rubble should be added very freely, and lime should be applied. Manure

ought not to be mixed in and the trees must be planted with their uppermost roots 2 or 3 in. below the surface. Every autumn for the first three or four years it is a good plan to lift young plum trees, shorten the thick roots, and replant at once. On light land, loamy (turfy) soil should be placed about the roots at planting time.

The following are some of the best cooking plums. Although all are self-fertile varieties it is, nevertheless, safer to have a mixed plantation than to rely on one or two varieties only. Czar, blue-black, August. Gisborne's, greenish yellow, August; Monarch, large, dark purple, Sept. Oct.; Pershore (yellow egg plum), yellow, August. Victoria, rose-red, September. Other cooking plums to be recommended for a mixed plantation are Pond's Seedling, a large reddish fruit ripe in September, and River's Early Prolific, small purple, late July.

There are some delicious fruits among the dessert plums, but as a rule they do not bear so freely as the cooking varieties and ought always to be interplanted with the latter. Some of the most reliable are Coe's Golden Drop, yellow, September, which does best on a wall facing west; Comte d'Althaus's Gage,



Fig. 4. Rough hole chipped out with cold chisel. Fig. 5. Driving wooden plug into hole.



Plum. The variety Victoria, as a trained tree, bearing large pink fruit

reddish, September, Denniston's Superb Gage, greenish, August, Early Transparent Gage, yellow and crimson, August; Jefferson, yellow and red, September; Oulh's Golden Gage, yellow, August, and Stint, small, yellow and red, August

Pruning the Trees. Plum trees need very little pruning; indeed, they are usually worse for much cutting. One reason is that they are addicted to gumming, and nothing is more likely to bring a bad attack of this, particularly in a mature trained tree, than severe pruning. The pruning necessary for the training of the tree should therefore be done at a very early stage, and after they have become established they should be pruned as little as possible. Repeated hard shortening should never be practised with open-headed trees, whether dwarf or standards, as such pruning is apt to result in the production of a large number of soft, whippy shoots, none of which will be found suitable for an extension branch.

Summer pruning may be applied to the new lateral shoots of plums. Matured trees

need little pruning, save the occasional removal of a branch here and there if the head threatens to become too thick. Trained trees, whether cordons, fans, or horizontals, will produce a certain amount of breastwood from the main branches, and the course of pruning in this case is the same as with similar trees of apples and pears, namely, summer pruning and winter spurring.

Pests and Diseases. The plum, in common with other fruits, has numerous enemies. It escapes the canker which is often so deadly in apples, but falls a victim to the equally destructive silver leaf, which attacks trees at all ages, but is most dangerous in old trees. There is no reliable remedy. The trees should be grown in well-drained, substantial soil containing lime, pruned little, and maintained in as healthy a state as possible, according to the circumstances and the means at disposal. Beyond that, prompt removal of badly affected branches is desirable. In July, every bit of dead wood should be burned, as it carries the spores which spread the disease.

Caterpillars are sometimes injurious, and in the presence of an attack the trees should be promptly sprayed—but not while the trees are in bloom in case of injury to the trees—with a solution of arsenate of lead, 1 lb. in 25 gallons of water.

Gumming is liable to cause trouble in plums as in other stone fruits, especially if the soil is undrained and very loose and rich, or if much winter pruning is done. But trees grown in well-drained, fertile soil, and pruned by summer pruning or branch thinning in summer, instead of winter pruning when there is very little sap moving, seldom gum. Green and blue flies (aphides) sometimes check plums severely, especially in dry spells, and curl the leaves. One of the general winter sprays, such as lime, lime-salt, and lime-sulphur tends to keep down aphides; but if an attack has to be fought directly, a paraffin and soft soap emulsion is excellent, and the best remedy of all is 1½ oz. of commercial nicotine and 1 lb. of soft soap in 20 gallons of water. To be efficacious this mixture must be used very hot.

How to Cook. To stew plums, remove the stalks and wipe the fruit; then put them in a stewpan with 6-8 oz. sugar and ½ pint water to 1 lb. plums. The amount of sugar varies with the kind of plum employed and the degree of ripeness. Let them simmer until soft.

Another way of preparing plums is to bake them in a jar. First skin the plums. If they are ripe, the skin will peel off; if not, they will first require scalding. A fruit knife should be used to draw off the skin. Put them in a stone jam jar or crock, with the sugar on the top and just a little water, and bake until tender.

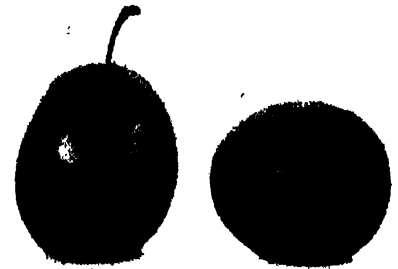
Except that plums are used instead of apples, the method of making plum charlotte is exactly the same as for apple charlotte (q.v.). For pie, flan or tart plums should be ripe or partly stewed first with sugar and allowed to get cold. Otherwise the procedure is the same as for other fruits when making these dishes.

Plum Jam. To every lb. of plums used in jam-making, ½ lb. sugar is required. Wipe and

stalk the fruit, put it into a preserving pan with the sugar, and cook slowly until the latter has dissolved. Keep the jam well stirred so that it will not burn, and when the sugar has melted bring it to the boil, boiling it for ½ hour or more. In the course of cooking most of the stones will leave the plums; these should be taken out as soon as they appear and if they are cracked the kernels blanched and then put back, the jam will be improved.

To make plum and apple jam, peel and core 4 lb. apples, cut them into rough pieces, add 7½ lb. sugar, and bring them to the boil in a preserving pan. Put in 6 lb. plums. Boil fast, removing the scum, until the syrup jellies when cooled on a plate. This should take about an hour. Pour the jam into jars and tie down the jars when the contents are cold.

Plum Solid. This sweet can be made with any kind of ripe plum. For 4 take 4 oz. granulated sugar, a lemon 1 oz. gelatine, and ½ pint water



Plum. Two specimens of Orpington Pionne a purple dessert plum of delicious flavour

to each lb. plums. A glass of claret and a stick of cinnamon an inch long may be added, or instead of the claret almond essence may be used for flavouring.

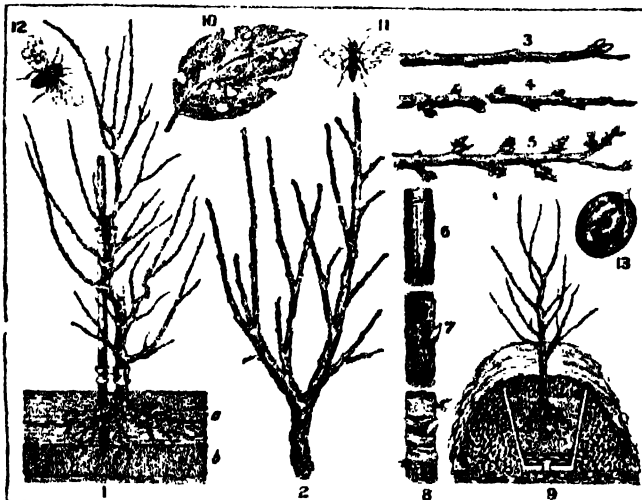
Having washed and stalked the plums, put them into a pan with the water, the sugar, the cinnamon, and the rind of the lemon thinly peeled. Simmer them until tender, strain off the liquid and rub them through a sieve. Melt the gelatine in the plum liquor, strain this into the purée, add the claret or essence, and re-heat the mixture. It should then be poured into a basin and stirred frequently until cool.

When cold turn the mixture into a mould that has been rinsed out in cold water, and leave it until it is set. Then turn it out into a dish and decorate it with chopped almonds or pistachio nuts and some Devonshire cream.

PLUMBAGO. This group of climbing half-hardy shrubs is suitable for cultivation under glass and of herbaceous perennials for the garden. For the former purpose the chief favourite is the Cape leadwort, *Plumbago capensis*, a leaf-bearing climbing shrub for the



Plumbago capensis, a charming blue-flowered plant for a sunny place in the rock garden



Plums. 1. Planting. a, very firm soil; b, heavy loam and grit. 2. Pruning a young tree. 3. Type of shoot to be discarded. 4. Pruning a fruiting shoot to form spurs. 5. Type of shoot to encourage. 6, 7 and 8. How to bud plums. 9. Potted plant during winter, showing layers of cinders, fine ashes, and straw. 10. Leaf sawfly grub at work. 11. Plum leaf sawfly. 12. Plum fruit sawfly. 13. Fruit sawfly maggot at work

By special arrangement with Amateur Gardening

PLUMBING: FOR THE AMATEUR

Practical Hints that will Save Time and Money

Other articles that bear upon the subject of Plumbing are those dealing with Bath; Gas; Gutter; Hot Water Supply; Lead; Pipe; Roof; Soldering; Tap; Water Supply, etc.

slightly heated greenhouse; it bears bunches of lovely pale blue flowers in summer. It is usually planted in a border of loamy soil, but may be grown in a tub or large flower pot, it should be pruned in February. Cuttings can be made from the fresh shoots in spring. Plumbago rosea, which bears rose coloured flowers in winter, needs the temperature of a hothouse.

Of the herbaceous perennials the best is Plumbago larpenae, a beautiful plant 12 in. or more high, suitable for a sunny spot in the rock garden or at the foot of a low wall; it needs sandy, loamy soil. The rich blue flowers open in August-September, and the leaves colour well. It is increased by division in spring.

PLUMBAGO: The Mineral. This is another name for graphite, a form of carbon. It has many applications as a lubricant. Plumbago is a conductor of electricity and in electroplating work it is used as a preliminary coating on non-conducting materials, such as india-rubber, which have subsequently to be electroplated. Crucibles are made of plumbago as they stand the heat of the furnace, and are extensively used for the melting of metals.

PLUMB BOB AND LINE.

The plumb line is simply a smooth piece of string or cord, fairly thin and of even texture, to the lower end of which is attached a plumb bob. It is used by suspending it and allowing it to hang down freely. It will then naturally assume a perfectly vertical position as soon as it has come to rest.

It is used for comparing upright parts of a structure, adjusting them to the line so that they themselves will be upright or plumb. All such operations as setting up doorposts, corner posts of buildings, and so forth, should be checked by the plumb line to make sure the vertical members are perfectly upright. When not in use, the line should be coiled up on a reel, wound on to a spool, or wound around a stick, and preserved in the tool chest or other convenient place.

There are various patterns of the bob, ranging from simple ones which are merely plain lead castings to instruments made of brass and filled with lead, accurately machined and finished. The illustration shows a typical pattern in use and indicates the method of handling it.

A plumb line is easily extemporised from a piece of smooth string to the lower end of which is attached any weighty object of symmetrical form. A heavy lead sinker, as used by anglers, could be employed, or a large hexagonal nut with the string passed through the hole in its centre.

A plumb level comprises a combined plumb rule and spirit level. It has a vertical bubble tube for plumbing upright work, in addition to the usual tube in horizontal position. Another type can be used with a plumb bob for vertical work. See Brick: Plumb Rule.

So far as the amateur is concerned, plumbing consists chiefly in making joints in lead pipes and sheets, generally in connexion with the water supply to the house, or the guttering and roof coverings. There are many difficulties that must be overcome for successful plumbing, which is a craft that is neither easily nor quickly acquired, but some of the repair work of a house, however, can be carried out by the skilful and careful amateur with no small degree of success.

A collection of the principal tools required is illustrated in Fig. 1. The hammer, saw, screwdriver, snips, pliers, and blow lamp are the ordinary tools to be found in any amateur's kit, but there are also some others used especially by plumbers.

The boxing stick and dresser, made from boxwood or other hardwood, are used for working the sheet lead into various forms. A drift and chase wedge are employed for working the lead into corners and angles. The boxing mallet is for driving the other tools, and the tan pin is for opening the end of the lead pipes. A rough chipping knife is used in conjunction with a hammer for cutting the lead, and a draw knife, not unlike a mole-knife, for cutting the thin sheets of lead by hand. A small hand saw is employed for sawing the pipes asunder. The snips or shears are for cutting the metal. A soldering iron of good size is necessary, as is also some flux, such as "killed" spirits of salts, or soldering paste. A ladle and solder pot are required, as well as a plumber's stove or other means of heating the solder. The shave hook and other hooks are intended for shaving the edges to a level surface before soldering.

Rasps are used for preparing the ends of the pipes before they are jointed. Fixing points or blunt ended punches are driven into the joints of brickwork or into other surfaces to obtain a temporary fixing by wiring or tying the pipes to them while the joints are being made. A rule, compasses, bevel, and chalk line are used for measuring and setting out the work. A wrench, hammer, and gas pliers are required for dealing with nuts and collars, especially those found on brass or iron pipes.

Typical Jobs. Before attempting any work the amateur should obtain a few lengths of lead pipe about 1 in. in diameter, and should then practise on them. Probably the repairs most commonly needed are those to water pipes and gutters. First of all, a suitable length of pipe is cut off with a saw or by means of a rasp, and the end of the pipe is opened out with the aid of a tan pin, as in Fig. 2. An assistant holds the pipe while the plumber takes the tan pin in his left hand and drives it home with the mallet in the right, thus billing out the mouth of the pipe. The pipe is then held on the bench by a hook-headed nail or lightly grasped in the vice.

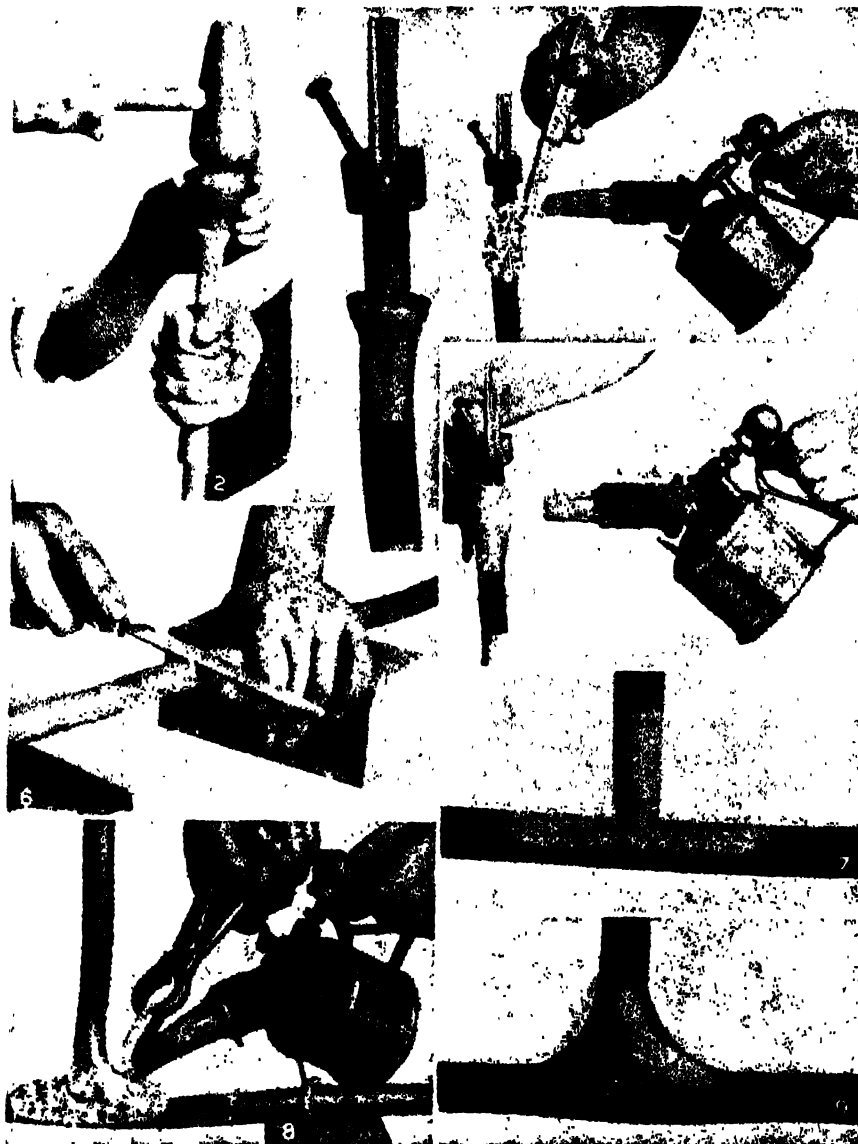
Should it be desired to fit a union to the end of the lead pipe, this can be accomplished by the following method, which also applies to effecting the joint with another piece of pipe. In Fig. 3, the union end, previously bent, is shown in position for soldering. Note particularly the wood screw rammed in between the union and nut to prevent the latter falling, and the wood chips inside to ensure alignment of pipe and union. The scraped pipe end may also be seen, as well as the size and lamp black deposit to prevent the solder adhering where not wanted. This mixture is applied to the pipe while in a moist state.

Fig. 4 shows the first step in building up the joint, the lead solder being applied to the pipe and union. The rough ultimate shape of the joint may be seen, and nearly sufficient solder has been applied to form the joint. The solder is built up in this way by melting it with the blow lamp, after which the joint has to be wiped. In Fig. 5 the joint is seen nearly finished and being wiped. The wiper is made of moleskin from which all the hair has been removed, and is boiled in tallow. The metal blobs running down to the blackened portion of the pipe have not actually adhered to it, and they will be found quite easy to remove with the fingers after the metal has cooled.

Fitting a Branch Pipe. To make a T or saddle joint, as in fitting a branch to a running pipe, the first step is to make a hole in the main pipe, as in Fig. 6. A half-round rasp is used, and the result of filing at right angles to the



Plumbing. Fig. 1. Plumber's tools. A, dresser. B, gas tongs. C, wood blocks. D, snips. E, wrench. F, gas pliers. G, screwdriver. H, tan pin. I, shave hook. K, back saw. L, chisels. M, blow lamp. N, paste. O, stake. P, lead. Q, wiping cloths. R, combination wrench. S, compasses. T, pliers. U, shears. V, rasps. W, cold chisel. X, fixing points. Y, knife. Z, hammer. aa, opening rasp. bb, mallet.



Plumbing. Fig. 2. Opening out end of pipe with iron pin. Fig. 3. How the union is fitted. Fig. 4. Melting solder to joint. Fig. 5. Wiping joint. Fig. 6. Use of rasp for cutting hole in main pipe. Fig. 7. Fitting branch pipe to main pipe. Fig. 8. Building up solder around joint. Fig. 9. Finished wiped joint.

pipe is to form a round hole in the pipe wall. After filing, the hole is scraped into a funnel shape. Fig. 7 shows the branch pipe fitted into the main pipe. The meeting and joint faces of the pipes are scraped clean with the shave hook, and subsequently the solder is melted around them as in Fig. 8, and allowed to run on the joint. About 1 lb. of solder is required, and when it is being applied the final shape of the joint is borne in mind.

The main pipe is secured by a nail and a piece of string to a temporary block of wood, so as to raise the pipe from the wall or other backing. The main pipe should be bent or closed up so as to grip the branch pipe. Fig. 9 illustrates the saddle joint complete. The main pipe has been straightened, but at least 20 min. must be allowed before straightening to permit of the joint cooling sufficiently. The pipe is straightened by careful bending with the hands and lightly striking it with a wooden mallet.

This class of joint is employed when it is required to run an additional branch, as for example for the supply of water to a tap over a copper, or some other position. Where it is necessary to make several bends in the branch pipe these should be worked before it is attached to the main pipe. Fig. 10 shows the pipe being bent at right angles over the

plumber's dresser, which is resting on top of a trestle to allow free movement and space in any direction. Care must be exercised not to distort the section of the pipe to any extent. This is avoided by careful manipulation of the pipe, gently hammering the sides wherever it exhibits any tendency to flatten. The hammering is done in order to drive the pipe back from an oval section to the proper circular shape.

When a sharp bend is to be made, the amateur may get good results by the method illustrated in Fig. 11, where a sharp bend in a pipe is made for a square corner of a rough piece of wood, in which a groove has been cut to the width of the pipe. The walls of the groove should be upright and exactly the diameter of the pipe, so that the latter is gripped firmly in the groove, and this tends to

prevent the pipe closing up at the bend. The same idea of providing a groove or chase for the pipe to be laid in should be followed in the corners of walls, or in places where the pipe has to be bent round, so as to reduce the sharpness of the bend and provide a secure fixing for the pipe.

Fixing on the Tap. Having worked the pipe to the desired location, the next step is to fix a tap on to the end of it. This is accomplished in substantially the same way as that in which the union end was fitted to the end of the pipe. In this case, however, there are short brass sockets or fittings usually supplied with the tap and fitted at right angles to the pipe as if the brass socket were the branch to be fitted to the main pipe. The solder is built around it and the joint subsequently wiped. Brass fittings have first to be tinned on the joint surface. This process consists in cleaning the brass, coating it with the soldering flux, heating it, and then working the solder all over the surface with the soldering iron.

When the brass fitting has been soldered into the pipe, the tap is screwed into it with a washer interposed between the joint surfaces to ensure a watertight connexion. The end of the lead pipe beyond the tap is closed by melting in some solder and then smoothing off the end with a soldering iron, or wiping as previously described. The same principles are applied to the repair of all kinds of lead pipe joints. In the case of iron pipes, the joints are almost always effected by means of screwed fittings, the end of the pipe simply having to be cut with the requisite length of screw thread on the outside of the pipe, to suit the sockets or other fittings used. When connecting pipes the threads are coated with red lead and gold size, or any good thick paint, a few strands of hemp being twisted into the groove before screwing home the pipe.

Repairing Gutters. Figs. 12 to 15 show various stages in the repair of gutters. In Fig. 12 the crack is shown in the gutter, but before attempting to close it, it must be made larger, as in Fig. 13, where the crack has been extended by cutting with shears. The gutter board underneath has a rough groove cut in it, about $1\frac{1}{2}$ in. wide and $\frac{1}{2}$ in. deep in its deepest part. In Figs. 14 and 15 the gutter side is shown cut through and bent back to enable the process to be seen clearly. The lead on each side of the crack, which was cut and turned up to allow the groove to be made in the gutter board, is now hammered down into that groove. All surfaces to which solder is to be applied are cleaned, and their immediate surroundings coated with the lamp black and size mixture. Fig. 14 shows the solder being melted and run into the groove. Rather more solder is required than would be sufficient to bring the surface flush with the existing gutter bottom. Fig. 15 shows the repair nearly completed. The solder is wiped flush with the



Plumbing. Fig. 10. Bending a pipe over the dresser. Fig. 11. Showing how a sharp bend is made in a pipe.

lead as the work proceeds, rendering a further heating of the joint unnecessary.

There are one or two points that the amateur plumber should bear in mind. The water supply companies have stringent regulations governing piping and fittings connected to their mains, and only materials and fittings of an approved specification may be employed. Local authorities also have regulations which must be complied with, especially as regard any work connected with the sanitation system. Some require that the work shall be done by a registered plumber. The advice or assistance of a competent person should be obtained before undertaking any task other than that dictated by conditions of emergency.

Plumb Level. See Plumb Bob.

PLUMB RULE. The plumb rule is employed for testing the uprightness of a structure. It comprises a piece of board with a pear-shaped hole at the bottom of it. A line is scribed down the centre of the board, and near the top a nail or peg is fixed, to which is attached a strong, smooth, and fine string. The lower end of which is weighted with a pear-shaped piece of lead, which swings clear in the pear-shaped hole cut in the board. To prevent the string of the plumb from dangling about a strap of leather or some other material is fixed across the board just above the opening, and is so arranged that the string can swing clear, but not to too great an extent.

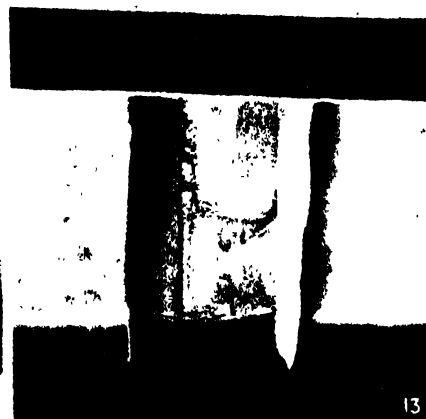
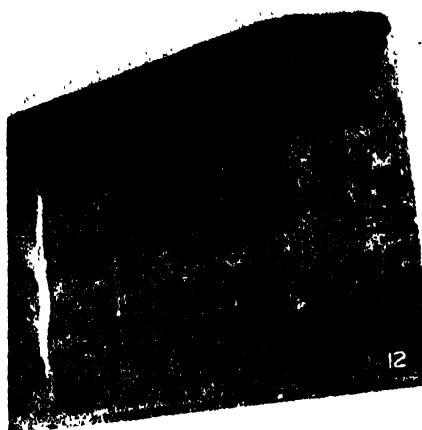
The illustration shows the method of use, which is to hold the board against the object to be tested, and to judge its uprightness, or otherwise, by the line of the string in relation to the line scribed on the board. If the structure is out of plumb, that is, not vertical, the upper end of the board will lean outward, or inward, and the bob will tend to swing over, and the string will not coincide with the scribed line.



Plumb Rule in use to test uprightness of door lining

In testing a corner of brickwork, or when erecting a corner post, a timber structure, or a door post, it is necessary to test in two directions, applying the plumb rule to both faces of the work, as it may be upright in one direction but not in another. Adjustments are made to the work until the string hangs exactly in register with the scribed line on the board.

A plumb rule can be made up by any amateur from a piece of board about 4 ft. long, 6 in. wide, and $\frac{1}{2}$ in. thick. The line should be scribed in the centre of the board, exactly parallel to both



Plumbing: repairing a gutter. FIG. 12. Cracked gutter before repair. FIG. 13. Gutter cut across and raised, and groove cut in gutter board. FIG. 14. Melting lead solder into groove and joint. FIG. 15. Surface of molten metal being levelled flush with the lead.

the outside edges. The hole is cut out with a pad saw or keyhole saw, and the edges smoothed off with a gouge or sandpaper. The line is twisted into three saw cuts made in the top end of the rule, one central and the others at convergent angles, as shown. See Plumb Bob.

Plum Cake. Cakes containing raisins are often spoken of as Plum Cakes. See Cake.

PLUM DUFF. To make this plain boiled pudding, which is also known as spotted dog, chop up very finely $\frac{1}{2}$ lb. suet and mix it thoroughly with $\frac{1}{2}$ lb. flour to which $\frac{1}{2}$ tea-spoonful baking-powder has been added. Add also 4-6 oz. well-cleaned currants, 1 oz. sugar, and a pinch of salt. Mix together with a well-beaten egg, adding a little milk if necessary. Scald and flour a pudding cloth, put the mixture into the centre of it, and either roll it and tie it at either end, or tie it on top. In either case leave plenty of room for the pudding to swell. Drop the pudding into boiling water and boil for 2-3 hours.

PLUME POPPY. This is the popular name of *helenium*, a group of vigorous hardy herbaceous perennials, 6 ft. or more high, with decorative grey-green leaves and plumes of small pale flowers in late

summer. They thrive in ordinary soil in a sunny place and are increased by division in autumn. The favourite kind is *Helenium cordata*.

Plum Pudding. See Christmas Pudding.

PLUSH. A longer pile distinguishes plush from velvet. Mohair plush is cheaper than silk plush and is sometimes used for covering large pieces of furniture. Teddy-bear plush is obtainable about 50 in. wide.

Linen plushes can be had for making curtains, but their pile is more easily flattened down than that of silk or hair plushes. Hatter's plush, made with a laid pile instead of an erect pile, and intended for covering silk hats, is a distinct variety. See Upholstery.

PLYMOUTH CHINA. The interest of Plymouth china for the collector lies in the fact that it was the earliest true or hard-paste porcelain to be produced in England of English materials. As it was being made for a few years only before 1770, when its inventor, W. Cookworthy, transferred his activities to Bristol it is not easy to come by, and is also sometimes difficult to distinguish from Bristol ware. The sides of the vessels from both factories frequently show a spiral ridge, due to a defect in the throwing. But Plymouth ware can often be identified



Plymouth China coffee pot, dating from 1768-70. British Museum.

by a characteristic smoky stain in the glaze, as well as by its high polish, and also by the cold, grey tint of the underglaze blue.

The pieces to look for are cups with foliage reliefs, statuettes, shell-shaped salt-cellars, and oyster and pickle stands. These are either plain white or with blue decoration, which was also done on mugs, saucers, sauce-boats, and full services. Enamelled designs were painted on plates, teapots, vases, and figures—those comprising birds and flowers having been done sometimes by a French artist from Sévres.

The usual mark, in underglaze blue or enamel colours, resembles a combination of 2 and 4, being the alchemists' symbol for tin. This appears in gold on some of the finest pieces, which perhaps belong to the Bristol period of Cookworthy's work. See China.

PLYMOUTH ROCK. One of the most popular breeds of poultry is the Plymouth Rock, which is generally spoken of as the farmer's fowl. This bird has a large frame which carries plenty of meat. It is a good, especially a good winter, layer. The hens are most excellent mothers, and the chicks are hardy and quick in maturing.

The Plymouth Rock is bred in 6 colours—barred, white, black, blue, buff, and golden barred, the latter being the latest to appear. The barred has a greyish, bluish white ground colour with glossy steel-blue bars running across. These bars must be distinct, even, and narrow. The chicks are greenish grey with pale cream under parts, or very dark, almost black, top colour, with a small spot of a light colour on the head.

Whites are pure white right through the chicks creamy white. Blacks are a rich, lustrous beetle green black, the chicks black and white. Buffs are a sound even shade of soft lemon buff, the chicks buff. Blues are of an even slaty blue throughout, the chicks blue and blue and white. The golden barred are as the barred, except that the ground colour is two shades of golden buff, the chicks buff. See Poultry.

PLYWOOD. Made of thin layers of wood glued together at right angles or diagonally against the grain under considerable pressure, plywood can be obtained in large sheets or panels, and in thicknesses from $\frac{1}{8}$ in. increasing by $\frac{1}{16}$ in. to $\frac{1}{2}$ in. These thicknesses are generally of 3-ply, but additional layers of wood are commonly used up to 5 ply to a thickness of $\frac{1}{2}$ in.

Various kinds of wood are used. Birch, white wood, satin walnut, and pine are softwoods, and suitable for backing or steaming. Of the commonly used hardwoods, oak, mahogany, teak, black walnut, and bird's-eye maple are obtainable in plywood. The more expensive plywoods have a core of cheaper wood.

The main feature of plywood is the strength it affords in a thin board. It is estimated that a piece of plywood is four times stronger than other wood of similar thickness. The method of manufacture, which places the grain of the layers at right angles to one another, prevents splitting, and renders the material

comparatively free from risk of warping and shrinkage. The amateur will find various uses for plywood, especially for the backs of cabinets, and for linings and bottoms of drawers and small boxes. It can be used for panelling, and because of the large size of the sheets it is useful for either temporary or permanent partitions in rooms. A simple plough plane for grooving rails, legs, etc., to take in plywood can be purchased (see Plough), and such furniture parts are generally obtainable also with the grooves ready worked on.

For all kinds of small articles plywood is very handy. Owing to its stiffness it is convenient in making small cabinet doors. The stiles and rails can be of thin wood, glued and screwed to the plywood back.

The best way of obtaining a good top surface on plywood is to size it first, rub it down with fine glass paper, give it another coat of size on top, and lightly rub over to remove grit. The material will now take a good polish, or it can be previously stained. If the edges of the plywood are in a prominent position, it is advisable to use a wood filler, and whiting mixed to a paste with glue answers very well. This should be rubbed well into the grain and cleaned off with glass paper before the wood is polished or painted. See Door. Angle Nook.

PNEUMONIA. Any inflammation of the substance of the lung constitutes pneumonia. It is one of the most fatal of the acute diseases to elderly persons, habitual drinkers, people who are underfed, and weakly children. There are three varieties of the disease. Acute croupous or lobar pneumonia attacks one or more lobes of the lung. Acute catarrhal or lobular pneumonia, also called broncho-pneumonia, is distributed over numerous small areas throughout the lung, and is a frequent consequence of bronchitis. In chronic or interstitial pneumonia the tissue forming the framework of the lung is inflamed.

The essential cause of pneumonia is a germ, usually the pneumococcus. Numbers of these organisms are very commonly present in the mouth and nose cavities of healthy persons, doing no harm until a chill or some other

cause lowers the vitality and enables the germs to multiply. One of the most powerful predisposing causes is intemperance. No other factor assists recovery so much as plenty of fresh air. The patient should have a large well ventilated room.

High temperature is one of the greatest dangers as it may lead to failure of the heart. If necessary, sponge the patient with cold or tepid water, uncovering only a small part of the body at one time, and drying it before sponging another part.

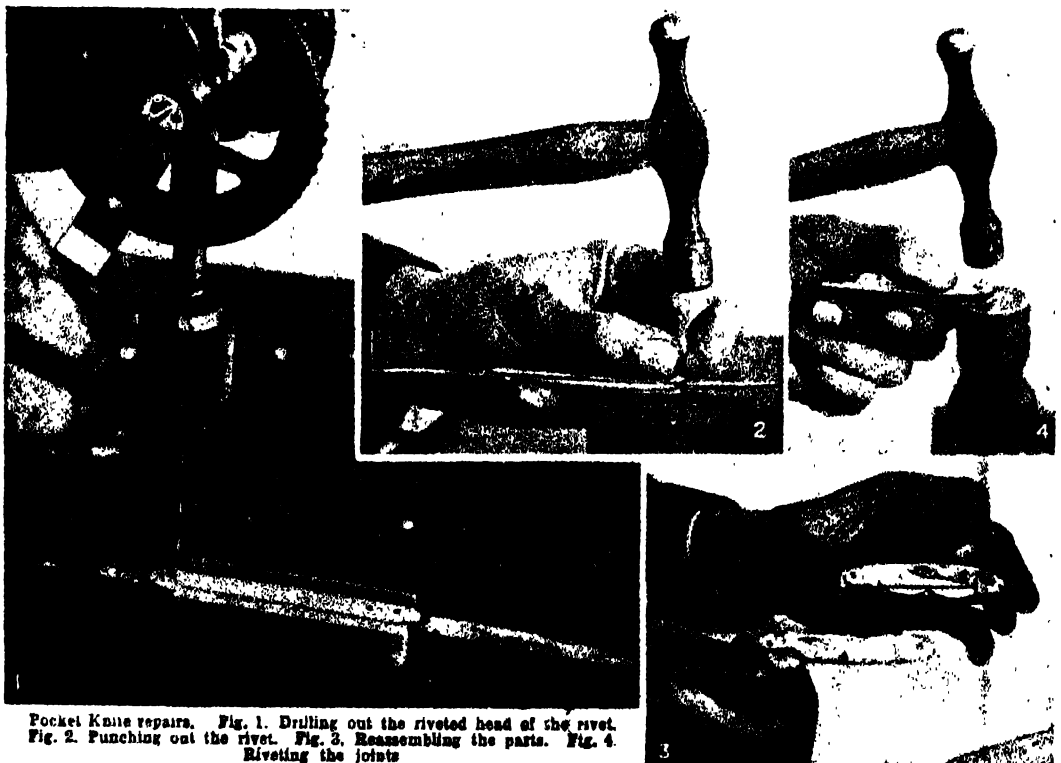
Pneumonia in Dogs. Pneumonia is a common sequel to distemper, or it may follow bronchitis or a severe chill. There is a high temperature, breathing is quick and difficult, and a characteristic symptom is blowing at the lips. The patient should be kept in a temperature of about 60°, with plenty of fresh air.

Envelop the chest in gamgee wool with a flannel coat over it. Apply compresses to the side as hot as can be tolerated. Place a piece of flannel in a length of linen and insert it in boiling water containing a little methylated spirit. It can then be wrung dry without hurting the hands. Place it well at the sides, at the back of the elbows, and under the chest. Cover with flannel, and then the gamgee wool. Do this several times a day. Feed little and often with strengthening foods. See Dog.

POCKET BOOK. A pocket book, in one meaning of the term, is not, strictly speaking, a book at all, but a wallet, usually of leather, provided with compartments for holding letters, papers, notes, stamps, etc. It usually folds down the middle and is of a convenient size to carry in a man's pocket. In another sense a pocket book is an ordinary printed book made in a small size. Pocket editions are obtainable of most of the classics and a great number of other well known works.

A third meaning of the term is almost synonymous with note book, except that the latter has a wider significance, embracing books of almost any size, while the size of a pocket book usually varies between about that of a post-card and that of a playing card.

POCKET KNIFE. Strictly speaking, the blades of a pocket knife are placed side by side at one end of the case, while those of a pen



Pocket Knife repairs. Fig. 1. Drilling out the riveted head of the rivet. Fig. 2. Punching out the rivet. Fig. 3. Reassembling the parts. Fig. 4. Riveting the joints.

knife are at opposite ends, but for practical purposes the distinction is no longer made, and the term pocket knife is applied to both.

The ordinary pocket knife is usually about 3 in. to 4 in. long. Blades are mounted between two plates, usually of brass, a brass rivet fitting a hole in the shank of the blade holding them in place. The rivets embrace the covering of horn, bone or other material, as well as the brass plates. A steel spring riveted in the centre presses against the shank ends of the blades, causing them to open and shut with a snap. A shoulder on the back of the knife blade fits the top of the spring and takes the strain of the blade when in use. Each blade is provided with a thumb-nail groove in order to facilitate its extraction from the case.

A well-made pocket knife is a long wearing tool, and it is only rarely that it needs attention. The most easily worn parts are the brass rivets. Constant opening and shutting the blades in time wears away these parts until the rivet either snaps or wears so thin that the spring loses its effect. While the parts are separated to put in new rivets the knife can be thoroughly cleaned and reconditioned.

The method is as follows. The blades, or blade if the knife has only one, are opened and clamped between two pieces of wood held in a vice. Using a very small drill about the size of a rivet head and a hand brace the burrs of the rivets on one side only are drilled away. This process is shown in Fig. 1. The knife is then removed from the vice, into which is tightly clamped a small hexagon nut. A small rivet punch is improvised from a piece of steel knitting needle of rather smaller diameter than the rivet itself. The knife is placed on the nut so that the rivet comes over the hole in the nut, and the rivet is then punched out (Fig. 2).

The parts should be cleaned by dipping them in petrol and rubbing them with a rag. A short length of stout brass wire is obtained of a diameter to fit the rivet holes, and the blades and spring are reassembled as shown in Fig. 3. The coverings are also fitted and the brass wire cut off to within $\frac{1}{8}$ in. of the covering plates. A flat hammer head is fastened in the vice to form an anvil for riveting. The rivet is held against the hammer head while a series of gentle taps are given to the other end in order to spread it.

Fig. 4 shows the burring over of the new rivet, which should be struck on its edge in order to create as large a burr as possible. When a substantial burr has been obtained on one side, the knife is turned over and a rounded burr knocked on the other side. All the rivets are treated in this way. The next step is to file off the rivet ends flush with the covering plates, taking care not to remove too much of the rivet head in the process or the rivet will not hold.

It occasionally happens that one side of the scale or covering of a knife cracks across. A suitable material is chosen, and a new scale cut and filed to shape to replace the broken one. Rivet holes are drilled to correspond, and reassembly is proceeded with as above. The life of the rivets is considerably lengthened by a drop of oil on the moving parts from time to time.

POD. The botanical definition of a pod is a dry fruit (possessing several seeds) which is dehiscent, i.e. which when ripe opens to let the seeds fall. It is popularly used in reference

chiefly to peas, beans and other members of the Leguminosae family.

PODOPHYLLUM. This hardy herbaceous perennial possesses large, deeply lobed leaves and bears chiefly white flowers in summer. They should be planted in damp leafy soil. Propagation is by division in spring. Two of the chief kinds are *peltatum*, 12 in. high, with pale flowers and small green fruits (hence its popular name May apple), and *emodi*, 12 in. high, with bronze-green leaves and white flowers followed by red fruits.

The dried root of the May apple is used in medicine as a purgative and stimulant for the liver, preparations in common use being podophyllin, dose $\frac{1}{4}$ to 1 gr.; tincture of podophyllin, 5 to 15 minims. It is usually taken in the form of a pill, which may be made up from 3 gr. of podophyllin resin and 21 gr. of extract of hyoseyanus. This is divided into 12 pills.

POET'S NARCISSUS. This is the common name of *Narcissus poeticus*, of which there are many beautiful varieties. The perianth is white and the crown or centre is of various rich colours. See *Narcissus*.



Poinsettia (*Euphorbia pulcherrima*) an evergreen house plant with brilliant scarlet flower bracts

leaf-mould and decayed matter one third, with a free addition of sand. During the summer months a cool, airy greenhouse or frame suits them, but in September they must again be placed in warmth.

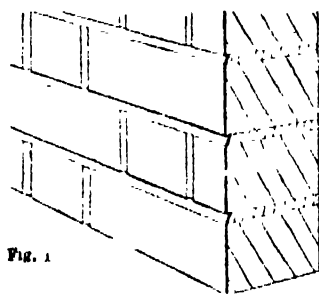


Fig. 1

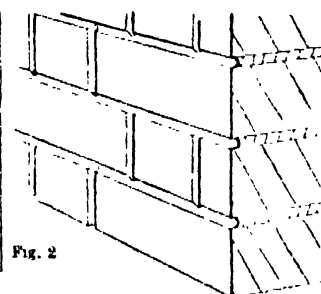


Fig. 2

POINTER: The Dog. Besides having a good nose to find the game, a pointer must have endurance and pace, and he should be built on lines which indicate the two latter. His forelegs should be straight and strong, the thighs long and muscular, the shoulders long and sloping, chest deep and not too wide, body well developed



Pointer. The sporting dog at work, trained to point out game.

and powerful, loin slightly arched, broad and muscular. In fact, he should be symmetrical all through, giving the impression of being able to gallop and stay. White usually predominates in the colour, and the markings may be lemon, orange, or liver. Whole-coloured black or liver are occasionally seen. See *Dog*.

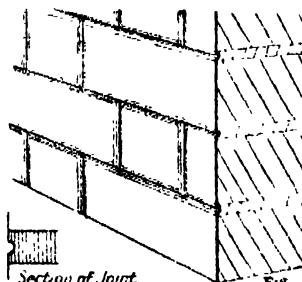
POINTING: In Building. Pointing is the process of finishing the face of joints in brickwork or stonework, giving it a better appearance and offering resistance to rain at the joints. It may be done as the building work proceeds, which is the strongest form of pointing, or it may be done at the completion, working from the top downward and striking the scaffold as the work is finished. The latter method gives the better and cleaner appearance, but it is not as strong as the other and it is more costly, because the joints have to be raked out to at least $\frac{1}{4}$ in. deep so as to receive the material that is used for pointing.

The struck joint is the best and strongest kind of pointing. It consists in pressing the mortar tightly into the joint with the trowel, forming a smooth face splayed back at the top edge so as to weather the joint, or in other words so as not to hold the rain that might drive on to the wall.

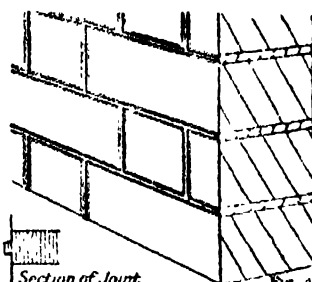
Flat pointing or flush pointing is carried out on the interior of walls that are not to be finished in any way other than limewashed. It consists in flushing the wet mortar off with the trowel, so as not to encourage the lodgment of dust. Flat pointing is sometimes used on external work, but it is then what is termed

jointed, that is, while the pointing material is still wet a grooving tool is pressed into it and, when set, there is a recess to receive more pointing material, usually of a contrasting colour.

In repointing an old building the joints have to be raked out to about 1 in. in depth and in the process the



Section of Joint



Section of Joint

Pointing: four types. Fig. 1. Struck joint, the top edge being splayed back to weather the joint. Fig. 2. Keyed pointing, in which the mortar is grooved. Fig. 3. Flat or flush pointing. Fig. 4. Tuck pointing, a more ornamental form, but less easy for the amateur.

edges of the bricks often become very damaged. They are first flush pointed so as to make sound the damaged edges, then a grooving iron or pointer is drawn along the wet pointing, forming a recess, into which is put usually a white pointing. The flush pointing is first coloured, however, to match the brickwork.

In keyed pointing the pointing material is pressed into the joints with the trowel in the usual way, then a grooving iron is placed into the joint and drawn along, thus forming a semicircular recess. The grooving tool is made generally from a piece of $\frac{3}{4}$ in. round iron, set up so as to form the handle at one end. There are other forms of keyed pointing, but these need professional skill and are used principally where rendering of the walls is to follow.

The tools required for pointing consist of a pointing trowel—a one having blade about 4 in. long and a straight-edged piece of wood about 3 ft. long, 2½ in. wide, and $\frac{1}{4}$ in. thick. An old table-knife ground, if a point is used for trimming the edge of the joint that has been pointed, so as to cut off any surplus material there may be.

The material used is, as a rule, cement mortar, made up of equal proportions of Port land cement and clean, sharp pit sand. The materials are mixed together dry, then sufficient clean water is added to make them plastic. Only as much of the material is mixed as can be used. The mortar is pressed into the joints, and brought to a smooth face by drawing the trowel along it, cutting the edges straight with the knife and straight-edge.

If old brickwork is being pointed, or new work at the completion of the ordinary brick laying, then, in addition to taking and cleaning out the joints, water must be copiously employed. On no account should pointing be done during very frosty weather, because the material will ultimately fall out of the joints.

POISON. Certain substances are statutory poisons. They are enumerated in a list prepared by the Poisons Board. Any preparation which contains a statutory poison must be plainly labelled as 'poison'. A medicine prescribed for internal use may be thus labelled. This fact need not cause alarm, but the instructions must be strictly followed.

The sale of poisons in the U.K. is governed by the Pharmacy and Poisons Act of 1933, which divides poisons into two classes. The first can be sold only by authorised sellers, e.g. registered pharmacists; the second may also be sold by persons registered by local authorities. The container must be labelled with the name of the poison, the word 'poison' or other prescribed wording, and the name and address of the seller. Poisons in the second class are mostly used for purposes other than the treatment of human ailments.

POISONING. In few emergencies can sagacious first aid be of such service as in that of poisoning. The need may arise in a variety of circumstances. It may be definitely known that poison has been swallowed or otherwise may have got into the body, and the nature of the poison may even be known. Without this knowledge, however, the probability of poisoning would be recognized when a person becomes ill shortly after taking food, drink or a dose of medicine.

Some poisons destroy tissues with which they come into contact, and are known as corrosives. There is evidence of destruction of the lining of the mouth, and possibly marking on the face and clothing. Such poisons cause an immediate burning pain in the mouth, throat and stomach, also vomiting, and perhaps purging. There may be difficulty in breathing. The patient is collapsed.

Amongst the corrosive poisons are the strong mineral acids, such as oil of vitriol; the caustic alkalis, such as strong ammonia,

corrosive sublimate, formalin, oxalic acid, certain metallic salts, etc. Carbolic acid and creosote also cause a burning pain, but vomiting is uncommon, and there is a sense of giddiness and intoxication, followed by unconsciousness.

Irritant poisons may or may not occasion a hot feeling during swallowing, but they cause nausea, vomiting, abdominal pain, purging and more or less collapse. Some cause difficulty in breathing, and some cramps in the legs. They include antimony, arsenic, copper, lead, mercury, zinc, croton oil and other strong purgatives, arum, cantharides, etc.

Narcotic poisons may like opium, cause immediate somnolence, deepening into sleep and coma; or, like belladonna, there may be pronounced delirium and then coma; or like alcohol and nitro benzene, they may cause signs of intoxication, followed by coma.

Some poisons, including aconite, diluted oxalic acid, prussic acid, etc., cause great depression of the heart, while others such as

hemlock, calabar bean and curare, cause muscular paralysis. Nux vomica and its alkaloids, strychnine and brucine, cause convulsions without impairing consciousness or producing signs of irritation of the alimentary tract.

In the event of poisoning a doctor should be sent for at once, and should be told what poison has been taken, if this fact be known. In the meantime, first aid should be rendered promptly. If the nature of the poison is known, instructions as to its treatment will be found under the appropriate heading in this book, but, if not, treatment should be along the lines to be now laid down.

If the poison be a corrosive, on no account should a patient be given any remedy which causes perforation of the stomach, but in all other cases, if the patient can swallow, an effort should be made to empty the stomach.

To this end a tablespoonful of mustard or two tablespoonfuls of common salt may be given in a tumbler of warm water. Vomiting

may be hastened by tickling the back of the throat with a feather or a paper spill, and when it begins the patient should drink large draughts of tepid water in order to wash out the stomach.

In the next place, or in the first, when dealing with a corrosive poison, something should be given to neutralise the activities of any drug remaining in the stomach; a list of the appropriate antidotes to use for each poison is given here. A strong infusion, or decoction, of tea is usually a good thing to give, as not only does it stimulate, but the tannic acid which it contains is an antidote for alkaloids the active principle of most vegetable poisons, and for some metals.

The irritation caused by a corrosive or irritant poison may be lessened by giving demulcent drinks such as milk, thin gruel, thin cornflour or arrowroot, olive oil, or white of egg in water. Oil should not be given, however, in poisoning by cantharides or phosphorus and as little water as possible in poisoning by oxalic acid or lysol. When poison has been in the stomach for some time, some of it may have passed into the bowel, in which case one or two tablespoonfuls of castor oil, or a tablespoonful of Epsom salts in a

TABLE OF COMMON POISONS GROUPED ACCORDING TO THEIR ANTIDOTES

POISON	ANTIDOTES
Oxalic acid (sap of sorrel or lemon)	Line water or tablespoonful doses of chalk, whiting, magnesia, or plaster taken from the walls and powdered mixed with water
Sulphuric acid (oil of vitriol)	Castor oil
Hydrochloric acid (spirit of salt)	Line plaster, magnesia, chalk, whiting
Nitric acid (aqua fortis)	Washing soda, or bicarbonate of soda, in water. Weak solution of ammonia
Strong acetic acid	Sal volatile in water
Washing soda, caustic soda	Olive oil
Caustic potash	Two or three tablespoonfuls of lemon or lime juice, or vinegar in water
Strong ammonia (spirit of hartshorn)	Weak solution of citric or tartaric acid
Carbolic acid	Crystal
Creosote	Olive oil
Corrosive sublimate (perchloride of mercury)	Epsom salts, $\frac{1}{2}$ oz. in warm water
Arsenic (white arsenic, rat poison, weed killer)	White of an egg in water
Antimony (tartar emetic, antimonial wine)	Tablespoonful doses of diluted iron, magnesia freely, in water
Phosphorus (match heads, rat poison)	Strong warm tea freely
Iodine (tincture of iodine)	Weak solution of permanganate of potash. Old oil of turpentine, tablespoonful, if doctor advises
Sugar of lead (lead lotion, white lead)	Weak solution of washing soda
Copper (bluestone, verdigris)	Starch in water
Silver nitrate (lunar caustic)	Epsom salts, $\frac{1}{2}$ oz. in water
Cantharides (Spanish fly, blistering fluid)	White of egg. No fat
Poisonous fungi	Weak solution of permanganate of potash, brandy, sal volatile
Zinc salts (zinc sulphate, zinc lotion)	Atropine, to be administered by doctor.
Oil of turpentine	White of egg, milk, olive oil
Digitalis (foxglove)	Epsom salts, $\frac{1}{2}$ oz. in water
Opium (laudanum, morphia, morphine, paregoric, chlorodyne, Battley's solution, Dover's powder, soothing syrups)	Strong warm tea
Belladonna (deadly nightshade, atropine, tincture of belladonna, A.B.C. tincture, eye drops to dilate the pupil)	Weak solution of permanganate of potash, strong warm tea, strong coffee; if patient unconscious, a pint of warm strong coffee by the bowl
Hyoscyanus (henbane)	Strong warm tea
Black nightshade	Strong warm coffee, sal volatile
Woody nightshade (bittersweet)	Ammonium chloride, large doses, given by a doctor.
Alcohol (spirits, liqueurs, wines, beer, rectified spirit, methylated spirits)	Alcoholic stimulants, strong warm tea.
Cocaine	Warm strong coffee, sal volatile.
Chloroform	For chloroform, large doses of bicarbonate of soda also.
Ether	Strong warm coffee, sal volatile.
Chloral	Strong warm coffee, sal volatile.
Chloralhydrate	Strong warm coffee, sal volatile.
Nitrobenzene (nitro-benzol, oil of mirbane)	Strong warm coffee, sal volatile.
Prussic acid (hydrocyanic acid, cherry-laurel-leaves and water-bitter almonds, cyanides)	Strong warm coffee, sal volatile.
Strychnine (nux vomica, Easton's syrup, tonic tablets)	Strong warm coffee, sal volatile.
Aconite (monk's hood)	Strong warm coffee, sal volatile.
Wolfbane	Strong warm coffee, sal volatile.
Tobacco (alcofine, fruit-tree spray)	Strong warm coffee, sal volatile.
Antipyrine (phenazone)	Strong warm coffee, sal volatile.
Phenacetin	Strong warm coffee, sal volatile.
Exalgin	Strong warm coffee, sal volatile.
Antifebrin (acetanilide)	Strong warm coffee, sal volatile.
Camphor (camphorated oil)	Strong warm coffee, sal volatile.
Sulphorus	Strong warm coffee, sal volatile.
Veronal (Barbitonum)	Strong warm coffee, sal volatile.
Trional	Strong warm coffee, sal volatile.
Laborinum	Strong warm coffee, sal volatile.

tumbler of warm water, should be given. For difficulty of breathing caused by corrosive poisons, hot cloths should be put on the neck, and the air may be moistened with steam by means of a bronchitis kettle (q.v.) which can be unimproved, if necessary. Pieces of ice should be given to the patient to suck.

Faintness and collapse are treated by keeping the patient lying down in bed and promoting warmth by blankets and by putting hot-water bottles, covered with flannel, at the feet and by the sides. Stimulants should be given in the shape of sal volatile, a teaspoonful in a wineglass of water, whisky or brandy, a teaspoonful or more, according to age, etc., well diluted, or strong tea or coffee. No alcohol should be given in poisoning by aniline, nitro-benzene, or related poisons. Pain or cramps are treated by placing large hot fomentations over the affected parts.

Any bottles found near the patient, or any vomited matter, should always be kept for the doctor's inspection. See Artificial Respiration; Emetic; Fainting; Food; Poisoning by; Promaine; Poisoning; Shock; and under the headings of all the principal poisons.

POKER. Pokers are made of iron, steel, brass, copper, oxidized silver, and other metals. The cheapest are little more than iron bars, but more expensive ones are made with a certain amount of ornament, and are usually part of a set of fire tools. Ornamentation is confined to the handle and upper part.

Gas Poker. One of the problems is a gas flame to ignite a coal or coke fire. It is connected to a gas point (of the bayonet type) near the fireplace, the gas is lighted, and the poker is thrust into the fire amongst the coke or coal. When the fire is well alight, the poker is disconnected and withdrawn.

POKER: The Card Game. Poker is a card game for any number of players less than seven. There are several varieties of the game, the commonest being draw poker, and the rules differ greatly in minor details. This game is played with an ordinary pack of 52 cards, and the cards rank as at whist; the ace can count high or low as required, but not both at once.

One player usually acts as banker, and sells counters to the others, redeeming them as required. A limit usually is set to the amount that any player may raise a bet. In one general variation each player begins with the same number of counters, and when he loses all or is frozen out, he drops out of the game. Any player may quit the game when he wishes, receiving from the banker then value for any counters he may still hold. No round may be shown until betting has ceased. The players enter for deal, the lowest dealing, and ace count low. In some forms of deciding the opening, player cards are dealt round, and the first to receive a jack deals.

The Hands. Five cards are dealt to each player, one at a time, and these five cards constitute a hand. There are 10 varieties of hands as follows. The hands are given in the order of their importance, beginning with the highest possible hand that can be held. A flush is 5 cards of a suit. Royal flush consists of the ace to the 10 of any suit. Straight flush is any 5 cards of a suit in sequence, excluding royal flushes. Four of a kind consists of 4 aces, 4 kings, etc., and one ordinary card. A full house consists of 3 cards of a kind, as 3 tens, and a pair. Three of a kind is 3 cards of the same denomination, as 3 tens, 3 fours, etc., and 2 ordinary cards. Two pairs are self-explanatory. One pair and 3 ordinary cards is the lowest hand but one. The lowest hand contains none of the above, and consists of all ordinary cards.

The royal flushes tie, since the suits do not rank at poker. Some players, however, rank the suits as at bridge, so that a royal flush in

hearts beats one in diamonds, etc. If 2 players hold hands of the same rank the highest denomination wins, e.g. 3 kings beat 3 fours. If 2 hands tie, except royal flushes, the highest card wins. In a sequence a top card, for example, decides, as does the top card in a flush, though in some forms of poker flushes are always equal. If each player has equal pairs the highest ordinary card settles the winner. If a hand has no scoring cards the highest card wins. If the highest cards tie, the second highest wins and so on. If hands tie throughout, the pot is divided. The player to the dealer's left is known as the age, and before the deal he places a counter or counters in the pool. This stake is known as the blind or ante, but must not exceed one-half the limit. Since this stake is a compulsory one on an unknown hand, it is invariably made as low as possible, usually a single counter.

How to Play. Each player is dealt 5 cards each in turn, and after looking at his hand he may do one of three things. He may pass, in which case he throws his cards face downward on the table, and takes no further part in that particular hand. He may go in, that is, decide to play, in which case he puts in the pool double the amount of the ante. He may put in the pool double the ante and then raise the stake to the limit, or any less he chooses.

Any player who wishes to go on then must put in the amount of the raise. One player may raise the contributions one counter, the next by 2 or 3 counters, and so on, but every player who decides to play must contribute the full amount of the highest raise plus double the ante. Any player who has already contributed before a player who raises, may decide to throw in his hand and lose the counters he already has in the pool rather than risk losing more on a bad opening hand.

When all players have decided to go in or pass, each player may discard any number of cards from his hand up to 5, and receive an equal number from the dealer. The discarded cards are thrown face downward on the table, and must not be looked at by any player. This drawing of cards is known as filling the hands, and the object of each player is to improve any hand he may have. A player may have a pair, for example, and he discards 3 cards and draws a fresh 3 in the hope he may get another card to pair, or otherwise increase the value of his hand. A player who draws no cards is said to stand pat.

The drawing is all important, for by it each player tries to deceive the others as to the cards in his hand. A player may hold 4 fours and an ordinary card, for example, when the pot is opened. If he stands pat the other players may suspect the cards he holds, or assume he has in any case a flush or full hand. If he discards one card, however, and draws another,

though the latter in any case cannot help him, his opponents are not sure whether he is drawing to 2 pairs, trying to complete a flush or a sequence, or even trying to make a full house when holding 3 of a kind and 2 odd cards. In the same way a player may hold 3 of a kind and throw out only one card.

A player on the other hand may hold 4 cards of a suit and draw one card to try and get the fifth for a flush. If he fails, it does not necessarily follow that he throws his hand down at once. For all his opponents know he may have obtained his flush, or he may have been drawing to 2 pairs to try to get a full house, and so on. He may decide to bluff and boldly raise the stakes, frightening other players into the belief that he has a good hand, and inducing them to throw their hands in. If players throw in their hands the winner is not bound to show his cards, and it is therefore not known whether he was bluffing or not. It is this fact which is important in the game, for if a player is a good one, it is never a certainty whether he is bluffing or not.

The players having filled their hands bet in turn or pass out. Any player may raise the bet of the last player or decide to see him, and all cards are exposed in the last case, unless a player still to bet decides to raise. But when the players decide to see the highest bet, the cards are exposed, and the best hand takes the pool.

Other Games of Poker. In straight poker the hands are not filled as in draw poker already described, each player retaining the 5 cards originally dealt him. Each puts in the pool the same amount as ante or blind, and players pass or come in as at draw poker. If all pass the pool is added to afresh, as for a new deal, the deal passing to the left. In stud poker one card only of each hand is dealt face downward, the remaining four being dealt face upward. The betting is as in draw poker.

Jack pots is a well-known variation of poker. In this form of the game each player puts an agreed stake into the pool, which cannot be opened, that is, played for, unless some player holds either a pair of jacks in his original 5 cards, or some combination which is better than a pair of jacks. Such a player may or may not open the jack pot as he pleases. If he does so he may open it for any stake he pleases up to the limit, and each player must stake a similar amount or throw in his cards. The stake may be raised up to the limit by any players. If no player comes in except the opener of the pot, the latter takes the pool, and shows the necessary cards which are equivalent to or will beat the pair of jacks required for opening. If no player opens there is a fresh deal, each player once more contributing to the pot, and so on until the pot is opened.

POKERWORK IN VARIOUS FORMS

Appliances, Tools, and Methods for this Decorative Handicraft

This contribution explains the methods for decorating suitable materials by means of pokerwork. Other artistic crafts treated on similar lines include Enamelling; Gesso; Lacquer; Leather; Mosaic; Papier Mâché; Stenciling; Woodcarving.

The ornamentation of wood, leather, and velvet by tracing the pattern with a hot platinum point or needle is known as pokerwork or pyrography. There are various appliances for this purpose. One of these, an electrical apparatus contained in a box, is illustrated in Figs 1 (left) and 3. A small plate screwed on to the front panel merely needs reversing to change the voltage. The machine can be fitted with either an adaptor or plug piece and used on any ordinary fitting.

A simple appliance is shown in Figs 1 (right) and 2. Instead of an ordinary union, a pyrotop is fitted into the neck of a bottle which is charged to two-thirds of its capacity with benzoline. It is advisable to leave the ben-

zoline in the bottle for half an hour, if possible, before putting in the top. There is a small tap on the pyrotop. When first heating the point, this should be vertical. Press the bellows slightly and light the little jet at the top of the union. Hold the platinum point in this until red hot. Then turn the tap horizontally and continue pumping to force the gas generated from the benzoline through the tube on to the point. Care must be taken never to touch any metal with the point when hot, as this will greatly damage it.

When burning wood, the point should be kept hot, so that as it burns along the outline it produces a tiny flame which will consume the smoke. There is a small attachment sold

which can be fitted to the cork handle. This is called a smoke diffuser. When working on leather or velvet, the point must only be a dull red, as the method is to scorch a line and not actually to burn it. In velvet the pile only should be touched, and it is advisable to use a small, light point. For general use where only one point is available, an ordinary flat point is best, as the outlining can be done by holding the point almost upright and sideways. For the broader work, the point may be used as a modelling tool. A horn point is useful for outlining, and burns a good clear line, cutting deeper than the flat point. Shading is done by means of a shading point, or the flat point held over the wood to scorch it.

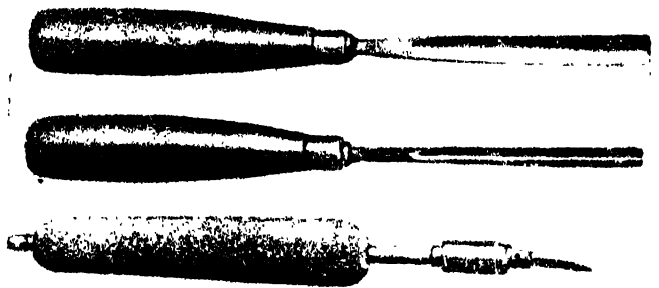
Pokerwork on Wood. The surface of the wood should be carefully prepared by rubbing over with a piece of sandpaper, and then the design is traced on it or transferred by placing the pencil side of the tracing next to the wood and going over the back with a hard pencil. Pokerwork transfers are obtainable in variety, but an original design is to be preferred where possible or one that is adapted to the shape of the particular piece to be decorated. The worker next pokes the outlines. He must use the point as a pencil and draw with it, avoiding any uneven pressure, which means a bad line. As soon as the point touches the surface, the work must be continued or a hole will be burnt. It is wise to practise on a piece of wood making lines, curves, etc., and in this way to determine the correct heat for the point. When the end of a line is reached, take up the point. Avoid pressing too heavily on the wood, as a line can always be deepened if necessary. The point of the needle must not be too hot if the wood is soft. If it is intended to colour the work, the outlining and main shading only should be poked.

The cabinet illustrated in Fig. 5 is an example of surface work. The design is first traced on the wood, previously prepared, then the whole of the outline is poked, using a horn point. For the fine lines a small horn-point is used. The work is then lightly rubbed over with an old piece of sandpaper to remove any charred wood or grease, and stained with water stains. The doors and the clothes of the figures, are coloured in liquid enamels. Antique gold bronze colour is used for the arches and corners of the cabinet. The top is polished wood.

A round box decorated with pokerwork and coloured with oil colours

makes an excellent workbox, powder or cigarette box, according to size selected. A suitable design is shown in Fig. 7.

Make a design of conventional flowers to fit the top, and transfer it. Then poker the outline making the larger flowers rather more pronounced than the rest of the design.



Paint it in oil colours, using megilp as a medium. Make all the colours as bright as possible and outline some of the flowers in gold. Stain the edge and the rest of the box walnut colour using two coats of stain, and wax polish.

Velvet and Leather. "Silver" pokerwork on velvet (Fig. 6), produces a good effect. The silver sheen is obtained by means of a sheath which is fixed over the point. Heat the point in the ordinary way and then try the sheath on a piece of the velvet. Most velvet pokers best going with the pile, but there are exceptions. The whole of the outline should first be worked and the design then coloured in with spirit stains or pastels. Spray with "Silver" fixative to make the work brighter.

Pokerwork may be used on heavy cloth to outline stencilling, and forms a decoration for the tops of floor cushions. The stencilling should be done with a strong brush to ensure a clear outline.

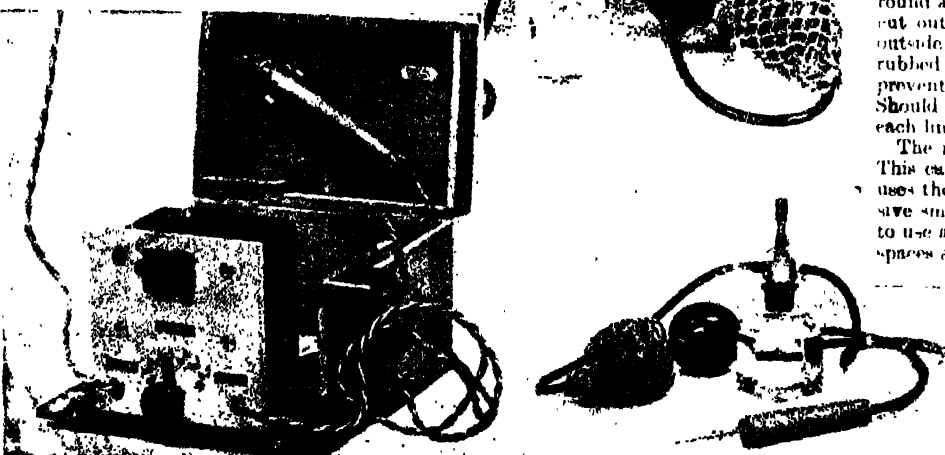
To use pokerwork on leather the worker should select a suitable design and when working, the point should be kept a dull heat, as only surface burning is required. The whole of the design should be poked and the necessary colouring then done. To make important parts of the design stand out use lacquer and bronze colours. The rest of the leather should be stained a dark colour to tone, and the whole should be wax polished.

Relief Poker Work. Relief-burning, which is an advanced form of pyrography, has the appearance of carving when finished and can be used to decorate furniture. A different point is needed, called a bent knife (Fig. 4). The work should be cramped to a table.

The point must be made very hot, and after the design has been traced it should be outlined as at A, Fig. 8. The line should be burnt to about $\frac{1}{4}$ in. deep, holding the bent knife almost parallel to the surface of the wood. It should not be allowed to lean to either side, and is held more upright in going round a curve. It is essential to have a clean-cut outline, and it is best to cut the outline outside the design. A little methylated spirit rubbed lightly over the surface to be burnt will prevent the wood from charring too much. Should there be an angle in the design, begin each line from the corner.

The next thing is to sink the background. This can be burnt out with the point, but it uses the point a great deal and causes excessive smoking. It is much quicker and easier to use a small gouge, as in Fig. 4. For large spaces a larger gouge can be employed. Carve out the wood across the grain as far as possible to prevent tearing it, and do not cut too deeply at first. Be careful not to damage the design. It is most important to keep the tool well sharpened. Fig. 8, B shows the background carved out.

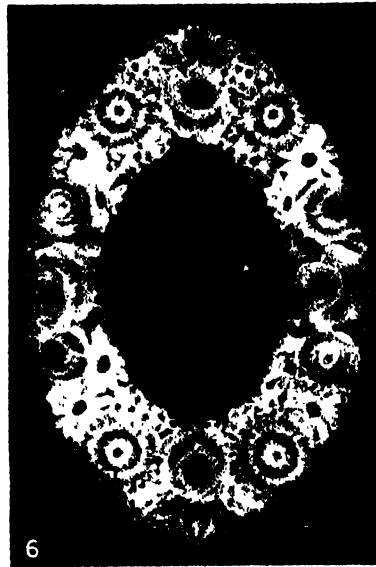
Before attempting the modelling study a similar subject, and determine which portions of the design require to be sunk. The edges are left and the portions of a leaf on



POKERWORK. FIG. 1. Two forms of apparatus used. In last shown on the left the point is heated by electricity. The right-hand one consists of a bottle of benzoline surmounted by a pyro top. FIG. 2. Showing the platinum point being heated in the benzoline flame. FIG. 3. The electrically heated point in use. FIG. 4. Tools used in some forms of this handicraft. Reading downward: small gouge, fluter, and bent-knife point for relief work.



Pokerwork. Fig. 5. Cabinet in surface poke, the floor lines of the design being worked with a horn point, and the whole finished in stains, gold bronze colour and enamel. Fig. 6. "Silver" work on black velvet coloured with spirit stains.



either side of the centre vein. It is a good plan to start from the centre of the leaf, using the flat side of the bent knife, and gradually to work almost to the edge, pressing a little heavier to make a depression. This is often done by means of the gouge in order to save the point (Fig. 8, C).

A fluter, another carving tool, shown in Fig. 4 is used to make a groove for the centre vein. The point is used to smooth away any irregularities and put in the finishing touches. The veins must be put in, using the edge of the point, and the background burnt even. It is necessary from time to time to brush over the work with a wire brush to remove the charred wood, and if the work is not sharp enough after this operation, touch it up again with the point. An uncoloured leaf is shown at D, Fig. 8. The colouring should be as soft as possible, merely to enhance the value of the carving, not to supersede it. The background should be stained to match the other furniture. Marquetry stains are best.

When polishing a large surface or an elaborate piece of work, coat it all over with liquid wax polish, using a soft brush. Allow this to become dry. Then smear a little wax polish on a piece of wood. Take a soft brush and brush this over the wood, up and down, until the polish is spread evenly over the surface of the brush. Then brush over the work, following the direction of the grain of the wood. Do this several times, leaving the work a few hours between each rubbing.

POKEWEED. The hardy perennial poke-weed (*Phytolacca decandra*), sometimes called the red ink plant, is suitable chiefly for the shrubby or wild garden. It forms a large bush 5 ft. or more high, with white flowers, succeeded by purple berries during autumn.

The plant will grow in any ordinary soil, but can only be recommended for the effect which is produced by its berries. The roots of the plant are poisonous.

Pole: The Measure. See Rod.

Polemonium. See Jacob's Ladder.

POLENTA. Served with liver and bacon, polenta makes a good supper, luncheon, or

POLISH. Any preparation that is used to produce a glossy surface on wood, leather, plate, linoleum, etc., is known as a polish. It is sold in liquid and paste form, and is usually applied on a rag or brush. Various kinds of polishes, such as those used for cleaning boots, brass, and furniture, are employed regularly in the home. See Boot Polish, Floor Polish, Furniture Cream and Polish, Metal Polish.

POLISHING: FINISHES FOR VARIOUS SURFACES

Effective Methods of Treating Wood and Metal

Reference may be made to the article on Furniture and to those on the various pieces of furniture that can be treated in this way, e.g. Table. See also French Polishing, Labour Saving Stain.

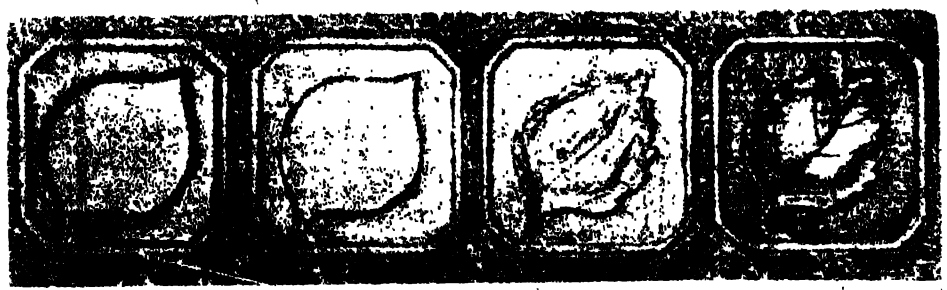
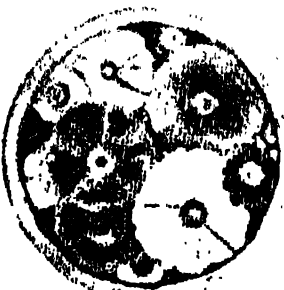
The process of french polishing is described in a separate article under that heading. As a substitute for french polishing the process known as glazing will be found useful. Glaze can be purchased ready made, but is easily prepared by dissolving 3 oz. of gum benzoin in 1 pint of methylated spirit. The mixture should be allowed to stand for several days before use, as it improves by keeping. The surface of the wood should first be filled and rendered perfectly smooth with fine glass paper. A body of ordinary polish is then applied as described in the article on french polishing.

The glaze can be applied with a brush, but it is customary to use a rubber and paint it on, applying it in the direction of the grain. The method is to dip the rubber in the glaze, which should be placed in a saucer, so as to wipe it over the work quickly, lightly, and evenly, taking care not to go over the surface twice until the first application is dry. With wide surfaces some experience is necessary, and unless great care is used the surface will be

left in ridges. This may be avoided by using a wide camel-hair brush, but practice will enable the largest surfaces to be successfully treated with the rubber, which is by far the better method.

Eggshell finish can be obtained with a glaze finish by adding about one third of sandarac to the mixture of benzoin and spirits; the finest finish is obtained by rubbing down the finished polished surface with pumice powder applied with a piece of felt slightly lubricated with raw linseed oil. Dip the felt into the oil, place on it some pumice powder, and rub well over the work with an even circular motion. The pressure applied although not light must not be heavy; the rubber must be kept supplied with powder and enough, but not too much, oil. When the surface has been dulled evenly all over it should be rubbed down with a clean rag and wiped over with benzoin. Small mouldings or carvings can be rubbed with a brush.

Oil Polish. Oil polishing has several advantages over other forms of surface finishing,



Pokerwork. Fig. 7. Lid of box with simple flower design in colours. Fig. 8. Panel in relief burning, which gives the effect of carving. A, traced design outlined. B, background sunk by means of a gouge. C, modelling of the leaf begun. D, the finished leaf before colouring.

and is particularly effective on oak. It does not crack or blister, neither does it show marks made with water, but it requires time and a considerable amount of friction. Prepare linseed oil by placing a quantity into a vessel, surround it with water, and allow it to simmer on a gas stove for about 1 hour. Pour it into a bottle and add one eighth the quantity of turpentine. Apply the oil with a felt or flannel rubber and rub it thoroughly into the wood. It is possible to apply too much oil, but the amount of rubbing cannot be overdone. The work should be turned on over a period of 2 or 3 weeks at least; a little oil and plenty of rubbing every day or every other day. When a suitable polish has been obtained and the work shows signs of sweating, a little methylated spirits can be rubbed over the surface, as this will dry it without spoiling the polish. Further applications of oil can be applied if required, and the spirit finishing will not affect it in any way.

Floors can be polished with oil polish applied with a pad made by wrapping some flannel round an old brush. By applying the oil polish to a stained floor and thoroughly rubbing it in, a lasting polish will result.

Wax Polish. Wax polishing may be used on any kind of wood and give an egg-shell gloss which is most effective on oak, mahogany and walnut. Either white or yellow wax should be shredded, placed in turpentine and left to dissolve. The consistency of the mixture should be that of cream. It is applied with brush or rubber, and must be evenly distributed and thoroughly well rubbed in. A dry rag should be used for finishing, but a good body of polish must be applied if the finish is to last. The finest effects of wax polishing are obtained by giving the surface a body of french polish, rubbing the surface down with pumice powder and then applying the wax polish, but if ordinary wood is properly filled and thoroughly cleaned down with fine glass paper a satisfactory polish can as a general rule be quite easily obtained.

Carved and Pierced Work. The treatment of carved work depends mainly on its surroundings, and generally a high polish is not desirable. The most suitable method is to cover the work with raw linseed oil, allow it to stand for a few hours, and wipe it off with a soft rag. After 2 or 3 applications, followed by vigorous rubbing, the groundwork will remain dull, but a soft polish will appear on the raised parts. Although a body of french polish can be applied to carved work, and some portions brought to a high polish, the better medium for woods like oak, chestnut and

manogany is a creamy mixture of bee-wax, turpentine, and boiled linseed oil applied with a rag, or brushed and rubbed down.

Fretwork and pierced woodwork are more difficult to polish owing to the broken surface. With wax or oil, it is mainly a matter of working into the crevices, but with french polish, a particularly light touch is required. The edges of large pierced surfaces, especially the end grain, should be filled with size or a prepared filler and well smoothed down. The polish can then be applied on a small pad made by wrapping a little cotton wool round a thin stick and covering it with soft rag.

Treatment of Stains and Cracks. The repolishing of surfaces which have become stained usually means the removal of the old polish, in many cases right down to the surface of the wood. If the surface is dented, it may need planing, or, at least, filling the surface to bring it up smooth and level. Special preparations for removing old polish can be obtained, but the usual method is to soak the surface with methylated spirit to soften the shellac, and rub it with a coarse rag. Glass paper will then be sufficient to take the top surface off. Unless the work is dented or cracked, or the stains go too far down, it is better to leave the original body so that a fresh surface of polish can be applied. With veneered surfaces, the greatest care must be taken. If the veneer is damaged, repairs can often be effected by the application of a hard filler, or by the use of wax.

Defects in polished surfaces do not always show at once, but when they do they should be remedied as soon as possible. The commonest defect in french polishing is known as sweating, and is caused by the excessive use of oil, which breaks through the hardened surface. It is difficult to treat, as any further hardening of the surface will be affected in the same way. Continuous application of furniture cream will keep the surface bright, but until the surplus oil embodied in the polish has worked out, further french polishing will do no good. Cracks which may have occurred on a french polished surface can only be removed by rubbing the whole of the surface down with pumice powder, and then repolishing in the ordinary way.

White marks on a french polished surface may be caused by defective materials, or by water or spirit stains on a glazed or poorly finished surface. The best way to remove them is to take off the top surface and repolish, to put a new coat of polish on the old one, without removing the stains is not advisable. Light stains can be taken out by wiping the surface with linseed oil and then rubbing it lightly with a rag dipped in methylated spirit. If the stains are caused by hot plates, the only thing to do is to rub the surface down and repolish.

Polishing Metal. The polishing of metal surfaces can be done in many cases by purely mechanical means, or alternatively by hand. Polishing wheels of various kinds can be fitted to the lathe or arranged separately on a special bench fitted with a polishing head

and a fly wheel. A useful polishing head with a drill chuck etc., can be bought for a few shillings. Hand polishing, essential for some work, is done with riflers, emery cloth and buffing sticks.

In machine polishing, turned work is first rubbed down with emery cloth, finishing with the finest grade. The surface should be left free from scratches, for all subsequent work depends on the quality of the emery finish. As a rule, the emery cloth is used in conjunction with a piece of wood.

The next process is to apply pumice powder by means of a buffing stick, made by gluing strips of bad leather to wood strips of convenient size. For iron and steel it will generally be sufficient to complete the polishing with pumice powder, but a high finish can be obtained by using flour of emery and oil. To obtain a good surface on turned brass in the lathe, first use emery cloth, then pumice powder, and finish with powdered rotten stone and oil.

By the use of a polishing head, with wire scratch brushes and polishing mops—and these can also be attached to a lathe—much more rapid results are obtained. The scratch brush is made of hard brass wire and used with vinegar and water or stale beer to produce a lather so that a scouring effect results.

For further finishing, brushes made of bad leather, cat's paw and swan-down are suitable for applying pumice, rotten stone and other polishing powders. As a rule the brush is revolved towards the article and the worker, and the highest speed is used for the final polish. The highest possible finish for brass and copper articles is obtained by the use of crocus powder applied with a cat's paw. Silver can be scoured with a scratch brush, then treated with rotten stone and oil and finished with rouge and water, the highest gloss being obtained by burnishing.

POLKA. The polka is danced to 2-4 time, and consists of light, springing, semicircular movements of three steps each. The original movement was to start off with a little spring, so that counting in teaching is 1, 2, 3, and not 1, 2, 3, spring. See Dance, Dancing.

POLLACK. Known in Scotland as lythe, the pollack is a large fish of the cod tribe with protruding jaws, and is rich in oil. It is cooked by the same methods employed for cod. Plain boiled or steamed is perhaps the best way to cook it, but it requires a well flavoured sauce. Large fish of this description can be baked with advantage. They should be cut into steaks or steaks, laid in a deep dish well lined with butter, sprinkled with seasoning and lemon juice, covered with buttered or greased paper, and baked until cooked through to the bone. Pollack should be served accompanied by piquant or shrimp sauce.

Occasionally the name of pollack is applied to the cod fish, also to some descriptions of fresh-water fish, but these are of a different species. A small fish of delicate flavour found in some of the Scottish lakes is called a pollack, but has, however, no relation to the other varieties of fresh water pollack. See Cod; Fish, Saucers.

POLLINATION. The supplying of pollen to the female organ (pistil) of a flower is known as pollination. Pollen is a mealy substance, usually yellow, formed in the male organs (anthers) and when the grains of which it is composed come in contact with the female organ there commences a process which results in the production of fertile seed. Sometimes a flower fertilises its ovules (the structure which normally becomes the seed) with its own pollen. More often fertilisation is brought about by pollen (which is produced in very great quantities) carried by the wind, or by insects, from another plant of the same species.

POLONY. A special kind of dry sausage first made at Bologna (hence the name), a polony



Fig. 1



Fig. 2

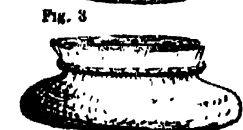


Fig. 3

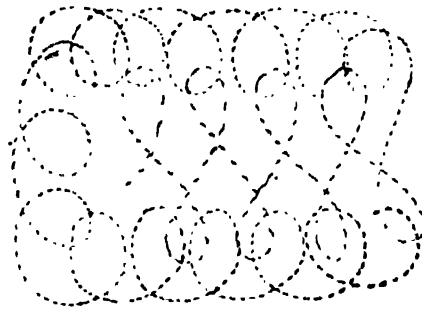


Fig. 4



Fig. 5

Polishing. Fig. 1. Rubber for wax or oil polishing. Fig. 2. Pounce bag of muslin for holding pumice. Fig. 3. Rubber made of rag for use in surface filling. Fig. 4. Method of using rubber by making continuous strokes with circular movement. Fig. 5. How the rubber is held.

is a sausage which has been either boiled or smoked, and is fit for consumption without further cooking. The polony is a mixture of finely minced meat, highly seasoned and spiced. In the best varieties lean beef, ham or pork is used as a foundation, with portions of fat bacon interspersing the lean. The sausage is flavoured with cloves or onions, spiced with mace or nutmeg and seasoned with salt and black pepper. A large clean sausage skin is then filled with the mixture, and it is boiled for 2 or 3 hours, or smoked for several weeks. If boiled the skin must be frequently pricked with a needle to keep it from bursting. In some parts of the country the skins are dyed a bright red. This skin is not edible. Sometimes strings of dried or smoked sausages are called polonies.

POLYANTHA ROSE. The dwarf polyantha, or baby rambler roses, as they are popularly called, vary in height from 12 to 30 in. and bear bunches of single, semi-double or double flowers in summer and autumn. They are useful for planting in flower beds or as an edging to large borders and for cultivation in pots under glass. They need the same treatment as other low growing roses. Pruning, done in early April, is severe or light according to whether small or large bushes are wanted.

The older type of dwarf polyantha rose is of low growth, 12-18 in. with bunches of small flowers. Some of the newer varieties are taller and more vigorous and bear larger blooms. A few of the best are *Kate's Poulson*, crimson scarlet, *Edbons*, and, bright crimson, *Ellen Poulson*, to c. 12. *Poulson*, light pink, *Gloria Mundi*, orange-salmon, *Katherine Zennet*, white, *Kersbergen*, dark red and *Mrs. Cutbush*, pink.

POLYANTHUS. The bunch-flowered primrose called polyanthus, one of the loveliest of spring flowers. The modern strains are



Polyanthus. Blossom heads of this many-coloured spring flowering primula

distinguished by vigorous growth and large clusters of bloom of rich and varied colouring—crimson, orange, yellow, and cream. They are invaluable for spring bedding. Seeds are sown in boxes of fine soil or on a prepared seed bed out of doors in May. The seedlings are grown on a reserve border during the summer and in October are planted where they are to bloom in April-May. Another method of propagation is to lift the plants after they have finished flowering, separate them into pieces each with a few roots attached and re-

plant them on a reserve border for the summer. A slightly shady place suits them best at that season. The old gold-faced polyanthus is now little grown except for exhibition purposes.

POLYANTHUS NARCISSUS. The bunch-flowered or polyanthus narcissus (*Nazotta*) is valuable for cultivation in pots under glass, in bowls of fibre indoors and in beds and borders out of doors. They need the same treatment as other forms of narcissus. The old small-flowered varieties have been superseded by others raised by cross breeding between them and the poets' narcissus (*poeticus*); they are called poetae narcissi. These are more vigorous and altogether finer plants with large bunches of fragrant showy flowers. They are also harder than the old type. Some of the best of them are *Aspasia*, *Elvira*, *Jane à Meville*, *Klondike*, and *Orange Cup*. They have white, cream, white, or yellow perianth, with cup or centre of yellow, orange, or orange-red. *See Narcissus*.

POLYGALA.

These are hardy or half hardy shrubs with small leaves and pea-like flowers in various colours in summer. The popular name is *milkwort*. The

favourite hardy species is *polygala chamaecaryx*, which is of low growth and suitable for the rock garden. It needs sandy peaty soil and bears pale yellow blooms in spring. *Polygala myrtifolia*, which will reach a height of 8 ft. or more, can be grown out of doors in mild districts and elsewhere in pots in the cool greenhouse; the flowers are reddish-purple. A compost of loam, peat, and sand is suitable. Pruning is done after the flowers have faded and propagation is by cutting at that season.

Polygonatum. This is the botanical name of Solomon's Seal (*q.v.*)

POLYGONUM. Knotweed is the common name of this group of hardy plants, some of which are valuable for the rock garden or border. Others spread very rapidly and may soon prove a nuisance in gardens of moderate size. The most familiar is a rampant climbing plant, *Polygonum baldschuanicum*, which is useful for covering a trellis or arbour, while it looks well if allowed to clamber over an evergreen. It bears bunches of small white flowers in early and late summer.

Two pretty little plants for the rock garden or front of the border are *affine*, *cinn.*, and *Bistorta*, 9 in., both bear rose coloured flowers in late summer. *Cuspidatum* and *saccharinense*, which grow 8 or 10 ft. high and bear white flowers in late summer, spread quickly, and it is difficult to get rid of them. They look well in the wild garden or shrubbery. A half hardy silvery leaved plant, *Polygonum lanigerum*, is often used for summer bedding.

POLYPODY. This is the popular name of a genus of ferns, called botanically polypodium. The common polypody (*vulgare*) is a hardy evergreen fern, 12 in. or more high, which likes a shady place and soil with which leaf-mould or peat and sand have been mixed. There are many attractive named varieties of this fern. The beech fern (*Polypodium phegopteris*) and the oak fern (*Polypodium dryopteris*) are other popular kinds. Many polypodiums need to be grown in a warm, moist atmosphere under glass and must be shaded from sunshine. A suitable compost is made by mixing loam, leaf-mould and peat

in equal proportions, and adding sand freely. Some of them are *Knightae*, *negrescens*, *Smithianum*, *Maxi* and *schneiderianum*.

POLYSTICHUM. The greenhouse and hardy evergreen fern *polystichum* is known as the bird fern from the curious shape of its leaves. Culture is not difficult if protection from the rays of the sun is afforded, whether in the heated house or open garden. *See Fern*.

POMEGRANATE. This is a flowering and fruiting shrub (*Punica Granatum*) which is suitable only for planting in a well drained border of loamy soil at the foot of a sunny wall in comparatively mild districts. Only in exceptionally favourable seasons are fruits



Pomegranate. Two specimens of the ripe warm-coloured fruit

likely to develop. The pomegranate bears scarlet flowers, but not, as a rule, very freely in Great Britain. Little pruning is needed.

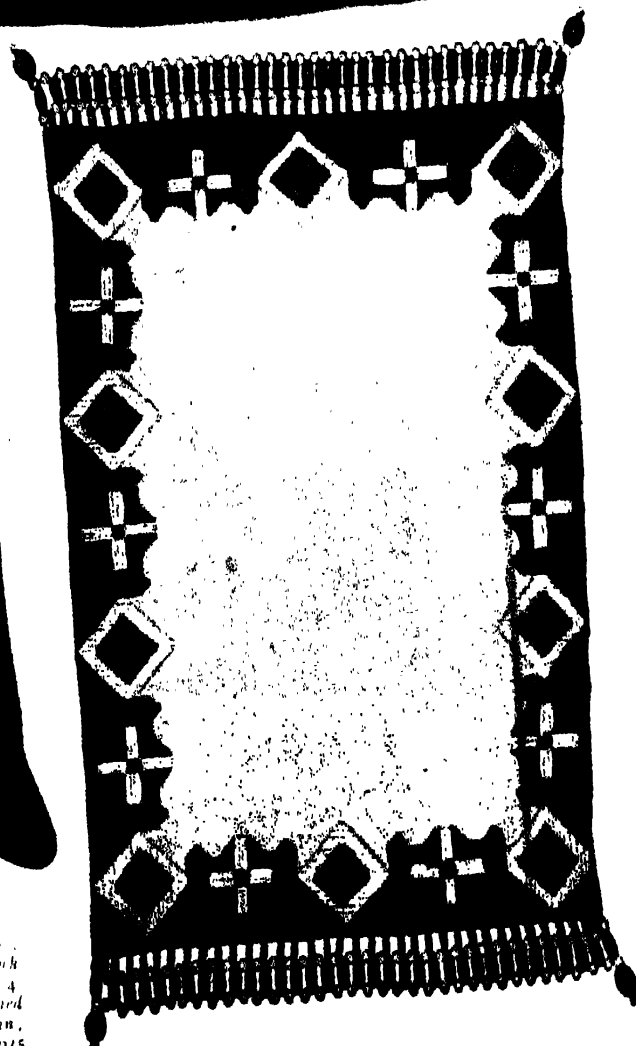
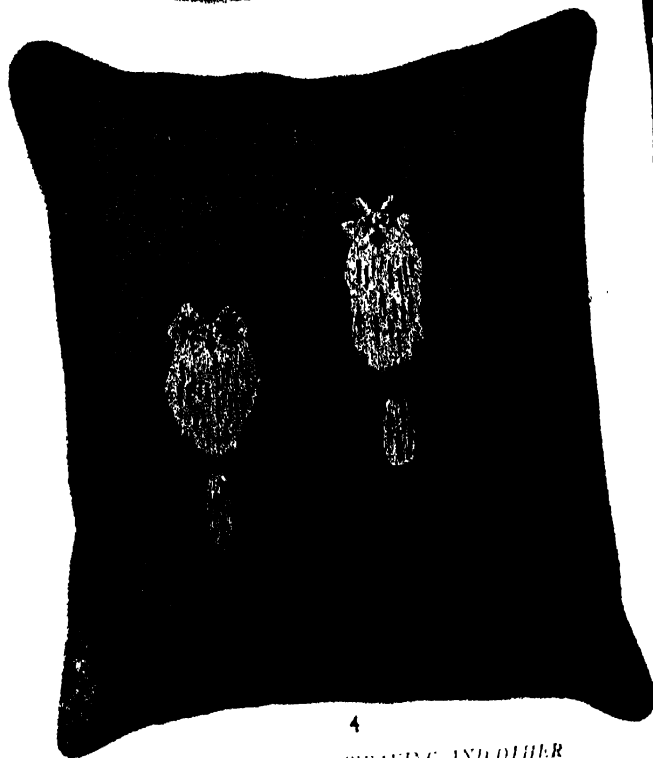
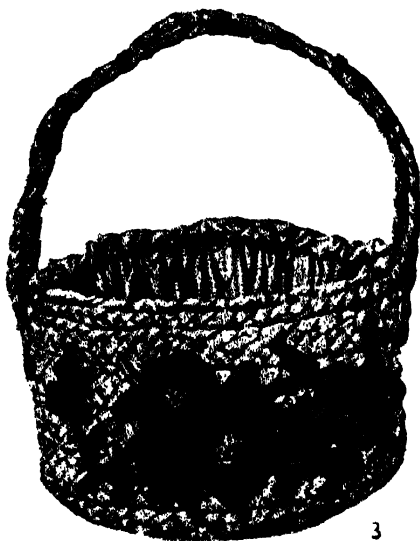
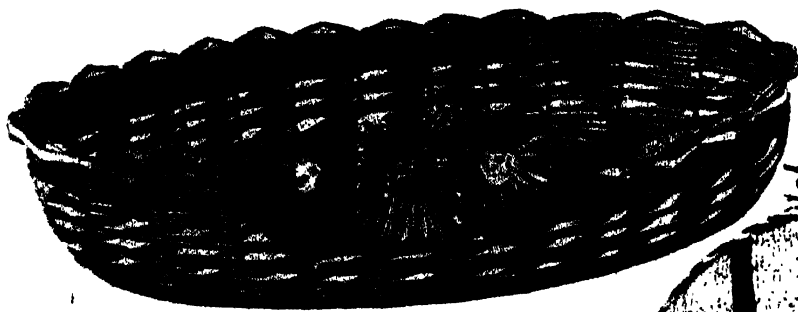
The fruit consists of seeds ripened in a tough, yellowish-red, leathery case. The seeds only should be eaten, the bitter yellow skin that surrounds them being pulled away after the fruit has been peeled. Pomegranates should not be cut open unless they are to be eaten at once, for the seeds quickly become discoloured. The juice of the pomegranate stains badly and is difficult to remove from light materials, but the general methods recommended for taking out fruit stains may be tried. *See Fruit*.



Pomeranian. Prizewinner of a breed of toy dog which makes a good house guard

POMERANIAN DOG. A splendid house guard and a devoted companion, the Pomeranian in his original stature adds a handsome appearance to his other good qualities. Formerly weighing from 10 lb. to 20 lb., he has now been bred more from the toy point of view, and present day examples are mostly under the 7 lb. limit of the miniature class. The head is much like that of the fox, with a sharp muzzle, dark eyes, and small, erect

EXAMPLES OF Raffia Work



RAFFIA - EXAMPLES OF WEAVING AND OTHER DECORATIONS

1. Foot basket decorated with raffia flowers, with tassel, gold center, woven on canvas. 2. Tea Co. v. Cotton fabric, of article shown in black and white in p. 1023. 3. Plaited work basket with raffia flowers. 4. Cushion of green hesian cloth with raffia design. 5. Mat embroidered with bright coloured raffia on canvas and mounted on Roman satin, size 10 x 12. General instructions for this work are given in p. 1025 (1917 p. 973).

ground and require oiling, which soon renders the dog unpleasant company indoors. Regular combing, by getting rid of the shed hairs, reduces the length of the coat, and thus curls instead of cording. Even so, the Poodle Club recommends that a third of the body should be clipped or shaved. The colour of a good poodle should be unmixed, that is to say, all black, all white, all red, or all blue. See Dog; Kennel; Mange, etc.



Poodle. A dog which owes its grotesque appearance to the manner of clipping its coat

POOL. This ball game is played on a billiard table by a number of persons. For it special balls are provided, each of these being a different colour, white, red, yellow, green, brown, blue, pink, and then, if necessary, the same colours in the same order, spotted. Each player has his own ball, and they play in turn, the sequence of the colours being set out on the scoring board in the order mentioned above. The game is for each player to play at the ball of the previous player in order to pocket it.

Method of Play. The players must first determine by lot, or by some other convenient method, the choice of the balls. Each player starts with three lives. The owner of the white ball places it on the spot, the owner of the red ball plays at it, and at the end of his break the next in order follows. The striker's ball must hit the one at which he is playing. If the latter ball is lawfully pocketed its owner pays a forfeit, loses a life, and his ball remains in hand until his turn arrives again. The one who pockets a ball continues to play, aiming at the ball nearest to where his own rests. If he can continue to play until all the balls on the table are pocketed, he places his ball on the spot, and the next player plays from hand. If the striker fails to score or makes a foul, the next in turn plays.

In pools of less than four players, the game continues until all the players but one have lost their lives. The surviving player then takes the whole pool. In pools of four or more players, when only two players are left in with an equal number of lives, they divide the pool. If they have an unequal number of lives, the game is continued until the number becomes equal, when they divide, or until one loses all his lives, when the survivor takes the whole pool. It is provided, however, in all cases that a striker who has lawfully pocketed a ball has the option of either continuing his break or dividing.

Starring. The first player who loses his three lives is entitled to purchase a star by paying into the pool the value of three lives, for which he receives as many lives as there remain to the player or players with the lowest number. The player, however, must decide whether he will star or not before the next stroke is played. If the first player who is out refuses to star, the second may do so; if the second refuses, the third may do so, and so on until two only are left in the pool, in which case the privilege ceases.

If before a star two or more balls are pocketed by the same stroke, including the ball played at, each having one life, the owner of the ball first struck has the option of starring. If he refuses, and more than one remains, the persons to whom they belong must draw lots

for the star. If the balls pocketed do not include the ball played at, their owners must draw lots for the star.

Only one star is allowed in a pool of six players, but two stars are allowed in a pool of seven or more players. The player taking a second star pays double the amount of the first star. The same player may take both stars.

No convenient method of handi-capping at pool has been devised. The handicap of starting with two lives in-

stead of three is a very severe one. The best player, however, may arrange to divide, in the proportion of their remaining lives, at the request of the player who survives with him to the end of the pool. The best player may also agree not to star. This information is taken from the rules of the Billiards Association. See Billiards; Russian Pool; Snooker Pool.

P.O.P. : In Photography. Printing out paper, or P.O.P., is used for the printing of pictures from photographic negatives. It is so called from the fact that when the paper is exposed to daylight behind a negative, the picture gradually prints out until it attains its full depth. It is one of the easiest photographic papers, but self-toning paper has largely taken its place and it is now chiefly used for temporary rough proofs. P.O.P. prints require to be toned in order to give them a pleasing colour; prints on self-toning paper have only to be fixed, since gold contained in the coating produces toning action when the prints are placed in the fixing bath.

P.O.P. is made by almost every manufacturer of photographic papers in several varieties, differing chiefly in surface. There are three descriptions of the paper, matt, semi-matt, and glossy, the last-named being chiefly used, as it gives the utmost detail in the pictures. Sensitive P.O.P. postcards are made for the production of photographs of this size. P.O.P. is used almost exclusively for printing from small negatives on account of its rendering of detail. It cannot be used for enlargements or for printing by artificial light, since the low sensitiveness of the paper makes it necessary to use daylight in printing.

When exposing the paper behind the negative, it is necessary to allow the light to act until the picture is very much darker than it is required to be when finished. The print is, therefore, examined from time to time by turning back one half of the printing frame. The correct degree of printing is reached when the shadows of the picture have a choked-up appearance, and when the highlights (the sky) are perceptibly of deeper tone than a pure white. In ordinary good daylight, printing will be completed in from 5 to 15 min., according to the density of the negative. Some practice is needed in hitting the exact degree of over-printing correctly; more over-printing is needed when a negative prints quickly, say, in 5 min., than when printing occupies a longer time.

A number of prints having been made, they require to be toned and fixed in order to change the reddish colour of the prints to an agreeable purple or purplish brown. The most satisfactory method for the beginner is to tone and fix at the same time, in a single solution which

contains gold chloride for the toning and hypo for the fixing, with other chemicals necessary for the process. This combined bath, as it is called, is best purchased in liquid form, or as a powder requiring to be dissolved in the requisite quantity of water.

The prints, without any previous washing, are placed one by one face down in the combined bath, and kept on the move. When the prints have taken on an agreeable purplish tone, transfer them to a dish of water and give them a thorough washing by allowing the water from a tap to run into the dish for about one hour. During this time the prints must not be allowed to clot together, otherwise the water does not obtain free access and the chemicals are not removed.

As a safeguard, and particularly if prints tone quickly, e.g. in less than 5 min., it is advisable to use an additional solution for extra fixing. This is made by dissolving 3 oz. of hypo in 20 oz. of water. Prints are transferred direct to it from the combined toning bath, and kept moving in it for about 10 min. After the washing process the prints are laid face up on blotting paper, or clipped up on a line to dry. On no account must they be put face down on anything, or heated, as the sticky gelatine surface will be spoilt. See Printing; Self Toning Paper.

POPCORN. This is an American dish made with maize or Indian corn. The unripe grains are parched over the fire until the heat bursts them open and the centre of the grain is exposed. In this condition it is eaten and considered a great delicacy. The best maize to use for popcorn is that with a smallish grain.

Popcorn is also sold as a sweetmeat. The grains are popped, and coated with either pink or white sugar very much in the same manner as is a sugar plum.

POPE JOAN. This card game is played with a special board, which consists of a circular tray or board revolving on a central post or stand. The tray is divided by lines running from the centre to the circumference into 8 compartments, each of which will hold 100 or 150 counters. Each division has a name, these being pope, king, matrimony, queen, intrigue, knave, ace, and game. Pope is the nine of diamonds, matrimony is king and queen in the same hand; intrigue is queen and knave. The ace counts the lowest.

The game is played with a full pack, save that the eight of diamonds is withdrawn. This card, and also the four kings, are stops, i.e. a sequence stops when one of them is reached. The cards are dealt round to the players, and the last is turned up for trumps. An extra hand is dealt to the centre of the table, and the cards therein are stops, as are those just before the ones that have been already led in play. Each player contributes an agreed number of counters for the stake, and these are distributed among the several compartments of the tray.

The elder hand, i.e. the player on the dealer's left, leads any card he likes, at the same time naming it. The next to play is the person who holds the next highest card in that suit, who also names it. This continues until no one can play a higher card, when the one who played last leads again, and the process is repeated. When the sequence is thus stopped, the cards previously played are turned face downward.

During the game a player who plays king, queen, ace, or knave of the trump suit or pope takes the counter or counters in the corresponding compartment of the board. If he plays both king and queen of trumps, he takes those from the matrimony compartment; if he takes queen and knave of trumps, those in intrigue. If the card turned up for trumps is ace, king, queen, knave, or pope, the dealer takes the counters in the compartment

concerned. The aim of each player is to get rid of all his cards, and the one who does this is the winner. He is entitled to the counters from the game compartment, and also to one counter from each of the other players. The holder of the pope, if the card is still in his hand, does not pay this counter. If, however, he has played it, he does.

If, as is usually the case, counters remain in some of the compartments when the game is over, the cards are dealt round face upward in order to see who shall take the spoil. Those who obtain ace, king, queen, and knave of diamonds take the counters in those divisions if there are any; pope entitles its receiver to the counters in that division. The counters in matrimony, if any, are divided between the holders of the king and queen of diamonds, and those in intrigue between the holders of queen and knave.

POPLAR: The Tree. Few trees grow more quickly than the poplar, and it will flourish in damp low lying land unsuitable for many other kinds. The best known is the Lombardy poplar (*Populus nigra pyramidalis*), a tall tree of columnar form—it makes a good windbreak or screen if pollarded to make it spread when the desired height is reached. The white poplar (*Populus alba*) and the aspen (*Populus tremula*), which is distinguished by the possession of leaves which quiver in the slightest breeze, are other kinds. Most of the poplars are easily increased by cuttings set out of doors in autumn. The aspen is usually propagated by suckers.

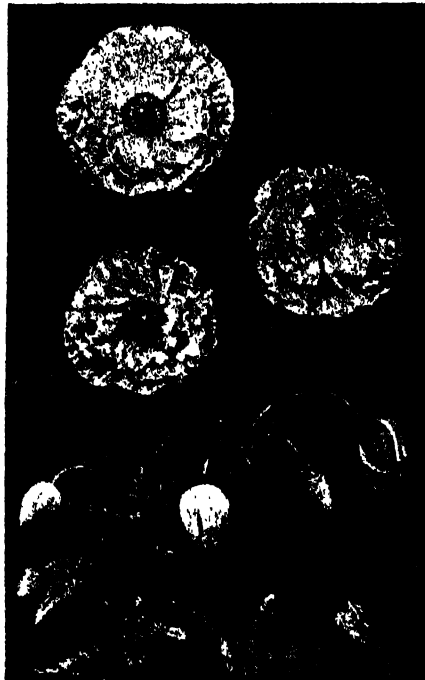
Uses of the Wood. Poplar, although not a wood of much commercial value, nor always obtainable from timber dealers, is useful for numerous purposes. It is used for sugar and herring barrels, packing cases, matches, clothes pegs, churns, pails, clogs, and wood wool or shavings for packing; also for brake blocks, the bottoms and sides of carts, wagons and barrows, and sometimes for held hurdles. It is soft, light and porous, easily dented, but does not splinter so easily as most woods and does not burn readily. It shrinks a great deal and is not very strong or durable, but is easy to work and seldom split by nails, though it holds nails well. In colour it is light grey or pale yellowish brown. See Wood.

POPLIN. Irish poplin is a combination of silk and wool, slightly ribbed, firm and warm without being stiff and heavy.

Cotton poplins, plain-coloured or striped, are the chief poplins in use for curtains and light upholstery fabrics. They are obtainable in a wide range of colours and guaranteed fadeless.

POPPY: The Flower. Three kinds of poppy are invaluable hardy garden flowers: the oriental, which is perennial, the Iceland, which is biennial, and various types of annual poppies. The oriental poppy (*Papaver orientale*) thrives in ordinary well-tilled soil and bears large handsome blooms in crimson, scarlet, rose, salmon and other colours in May and June. It dislikes being disturbed and should not be transplanted unnecessarily; it is increased by sowing seeds in May or by taking root cuttings in autumn. There are many named varieties.

The Iceland poppy (*Papaver nudicaule*) is grown in gardens as a biennial, seeds being sown in boxes of fine soil or out of doors on a prepared seed bed in May to produce flowering plants the following year. The seedlings must be transplanted before they become crowded and put out in autumn or spring where they are to bloom. The Cornara is an improved type of Iceland poppy. The chief favourite among the annual poppies is the Shirley; but the large double varieties of the grey-leaved opium poppy are very handsome. All these are raised from seeds sown out of doors in March-April where they are to bloom in summer. The flowers of



Poppy. Flowers and buds of the Eyeburgh poppy, a dainty variety with a crinkled edge

poppies are very fleeting, but if cut before the buds have expanded they last well in water indoors. See Colour Plate facing p. 876; Iceland Poppy; Opium Poppy.

POPPY ANEMONE. This is one of the most brilliant of garden flowers: its botanical name is *anemone coronaria*. There are many strains or types, the St. Brigid being the favourite: the flowers are large and of brilliant and varied colour—scarlet, crimson, purple, rose, etc. The roots should be planted on a sunny sheltered border in September to provide blossoms in spring: they are set 3 inches deep and 4 or 5 inches apart in well drained friable soil of loam, leaf-mould and sand. Planting in February will ensure a later display of bloom.



Porch. Fig. 1. Quaint brick porch with pointed tiled roof which suits this modern type of country cottage. Fig. 2. This formal porch for a small town house is painted to harmonize with the door

Humphrey & Vera Joel

PORCELAIN. Porcelain is a fine, thin, transparent ware, practically the same as china. See Chelsea; China; Dresden; Plymouth; Sèvres, etc.

PORCH. A porch is a covered entrance to a house, either built on to it in front of the door or part of the house itself. Whether it is a successful adjunct or not depends on its harmony with the architectural style of the house. Porches are sometimes added to existing dwellings with bad results because they completely spoil the frontages designed by architects in planning the main buildings. A porch must be an important feature; it is therefore essential that it should be an attractive one.

For our first illustration a quaint brick porch with a tiled and pointed roof is selected. Both brickwork and tiling accord with the style of the little house, the walls of which have been partially whitewashed with so thin a coating that the outlines and colour of the bricks show through it. The porch is ceiled and has an electric light fitting which illuminates the entrance and the name on the door.

Very different in character is the other small porch illustrated in Fig. 2. This somewhat formal entrance belongs to a house in a town street. The classical character is suggested by the pilaster effect at each side and by the projecting roof. The paintwork of porch and doorway gives distinction to the front of the house. Glazed bricks are used for the step, and there is an electric light fitting.

Half-timbered houses and country cottages are often designed with picturesque porches. A combination of herringbone brickwork and oak for the timbers and side balustrades is employed to construct the porches of some modern houses with excellent old world effect. For a whitewashed cottage the simple roomy porch illustrated in Fig. 3 is a charming architectural feature. The door and timbers are of old oak, and the tiles of the porch roof match those of the house. The side windows are glazed to afford better protection from the weather. The rafters are exposed, as a ceiling would be out of place in such an entrance.

A dignified porch is illustrated in Fig. 4, with its semicircular formation, domed



Porch. Fig. 3. An attractive porch made from old oak beams roofed with tiles, set outside a white-washed cottage. Fig. 4. Domed and pillared entrance in the angle of two walls of a brick-built house No. 4 by courtesy of *Our Homes and Gardens*

roof and pillars. It is an attractive feature for the "angle house" designed with two wings to catch as much sun as possible. In such a porch there is room for a white painted seat at either side of the door, or for green tubs containing hydrangeas or other suitable flowering plants. The roof is tiled and finished off as a part of the interior of the house. It has a central enclosed electric light fitting.

An attractive porch for a bungalow can be constructed entirely from light timber. The uprights, 3 in. square, are connected by short cross-pieces of timber, 2 in. deep and 1 in. thick, mortised or dowelled into place. At the top the uprights are framed into place with timber 4 in. in breadth and 3 in. in thickness, finishing flush with the tops of the posts. The roof rafters are brought down on to this plate and the roof tiled. The eaves are finished with soffit and fascia board, faced with O.G. cast-iron guttering, the down pipe for the rain water being provided in the most convenient position adjacent to the rain-water drainage system. Such a porch should be made in prepared timber, and looks well if oak stained to contrast with whitewash or rough cast and brick. See Loggia; Lych Gate; Name Plate; Path

PORK. The season for pork should be confined to the winter months, or from the end of September to the beginning of April. When salted, especially in the form of bacon, pork is more wholesome than the fresh meat. This is the only salted meat which is superior in point of digestibility.

Particular attention should be paid to the condition of the meat, and to see that not only is it free from taint, but that the fat is devoid of kernels. The best joints for roasting are the leg, loin, and fore-loin; the spare rib, also, may be roasted, but it is not so thrifty. Roasted joints should be stuffed with sage and onion stuffing, served with thickened brown gravy and accompanied by either onion or apple sauce. If it is not desired to stuff the joint the stuffing may be formed into balls and cooked in the tin along with the meat.

To prepare the leg for roasting, saw off the shank bone and make an incision between the rind and the flesh just below the knuckle.

Fill the cavity with the stuffing and sew it in securely, or it will ooze out and be partially lost in the pan. Then, with a sharp pointed knife, score the surface on the rind in even lines about $\frac{1}{2}$ in. apart. Cut well into the rind, but not deeper than the outer skin. Pork should always be well basted with plenty of good dripping, and be exposed to a good solid heat, especially at first, but on no account must the crackling be scorched. Allow 20 min. to the lb. for roasting the leg and 20 min. over.

All solid joints require longer to cook than thinner pieces, and the time for cooking meat should be measured rather by the compactness of the flesh than the actual weight, after considering the average. The crackling of pork is improved if, when nearly cooked, it is rubbed over the surface with butter, dredged slightly with flour, and then basted before being returned to finish. The directions given apply to all joints of pork, but for loin and fore-loin saw off the chine. For loins or spare rib make the incision where convenient well under the skin. Before roasting these, and after the chine bone is removed, just separate the rib bones, but be sure that the joint is left whole.

The gravy should be served in a gravy-boat. Any trimmings should be added to the stock from which the gravy is made, also the dregs remaining in the pan in which the joint has been roasted should be added, after the dripping has been poured off. Pork dripping should never be mixed with that from other meats. It is always rather highly flavoured and will have absorbed the taste of the stuffing. Pork dripping can be used for basting poultry or game.

To boil a leg or hand of pork, saw off the shank bone and put the leg into a saucepan with a large onion stuck with 3 cloves, 1 lb. carrots, and the same of parsnips. Cover it with cold water, boil up, skim, and continue boiling very gently for about 3 hours, or a little over or under according to the size of the leg; 20 min. to the lb. is usually allowed for thick joints, but pork must invariably be cooked right through to the bone. For pork and beans add $\frac{1}{2}$ lb. soaked haricot

beans 30 min. before the pork is cooked. Drain the beans and serve separately with parsley sauce. The spring or belly of pork is usually salted and boiled, but if not too thin it can be roasted. Care must be taken not to overcook it. Make up some sage and onion stuffing into balls, fry these, and dish with the pork.

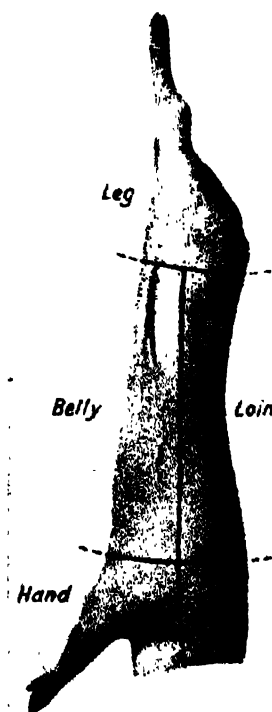
The ears and feet can be cooked together. Purchase them ready cleaned, and soak them for 12 hours, then rinse and boil them till tender. Let them get cold, and then soak again for 1 hour in a little vinegar, 2 cloves, 1 bay leaf (bruised), and seasoning. When ready to cook, dry them and cut the ears in slices and bone the feet, cutting the flesh in neat pieces. Fry the slices and pieces in butter after egging and crumbing them, or they may be dipped in batter before they are fried.

Pork chops should not be cut more than $\frac{1}{2}$ in. thick. They should be neatly trimmed, beaten with a cutlet bat, and fried in hot fat. To dish, sprinkle with a little chopped onion and powdered sage. Pork cutlets are cut from the neck bones, and should not be more than $\frac{1}{2}$ in. thick. They should be egged and crumbed, and a little minced shallot and powdered sage can be mixed with the egg. The cutlets are fried on both sides in hot fat, until thoroughly cooked.

Pickled Pork. To pickle pork, cut the meat into joints of a convenient size and, after wiping it and removing all kernels and pipes, rub it well with common salt. Let it stand for 12 hours, then drain off the brine, and the following day steep it in a pickle prepared from 1 $\frac{1}{2}$ lb. common salt, $\frac{1}{2}$ lb. brown sugar, 1 oz. saltpetre, and a gallon of water. Boil these ingredients together for about $\frac{1}{2}$ hour, remove the scum from the top, and then strain them. The pickle should be allowed to cool before being poured over the meat, and the latter should remain completely immersed in it for about 12 days.

Pork Pie. To make a raised pork pie, weigh out 1 lb. neck of pork, freed from skin and bone, cut it up finely, season it to taste, and then add $\frac{1}{2}$ tablespoonful chopped onion and $\frac{1}{2}$ teaspoonful powdered sage. Make 6 oz.

hot water crust (see Pastry), turn it out hot on to a floured board, and knead it until it is perfectly smooth. Cut off three-quarters of it and roll it out to a circle about $\frac{1}{2}$ in. thick, keeping the edges even and the strip itself of uniform thickness. The remaining piece of pastry should be wrapped in paper and kept hot over steam. A raised pie mould like the one illustrated should be used for baking a pork pie. Line the mould evenly with the large piece of pastry. If no mould is available



Pork. Showing how the carcass is divided to form joints

the pastry may be shaped over the bottom of a round cake-tin. Stand the tin in the centre of the circle of pastry, and press pastry evenly up the sides, keeping the top edge level. Remove tin and tie a band of greaseproof paper round pastry case.

Put in the pork mixture, moistening it with a little stock or water, and press it well in, leaving a narrow rim of pastry standing above it all round. Roll out thinly the smaller piece of pastry, cut from it a round for the top, brush the edges of it with cold water and then lay it on top of the pie, pressing the edges together. A ridge of pastry standing about 1 in. higher than the pie should be left all round, and this should be trimmed and decorated with a pair of scissors. A hole must be left for steam to escape. Any scraps of pastry may be used to decorate top of pie.

Brush some beaten egg over the whole pie, and bake it in a moderately hot oven for 1½-2 hours or until the pastry is lightly browned and the meat tender. When the pie is cooked, pour through the hole in the top a little warm stock in which a sheet of gelatine has been dissolved, and then allow it to get cold. See Apple Sauce; Bacon; Pastry; Sage.

PORRIDGE. The preparation known as porridge is made by stirring oatmeal, wheat meal, Quaker Oats, or some similar patent food into boiling water or milk, or a mixture of both. It is eaten for breakfast either with sugar and hot milk, with cream, or with salt, and is both heating and nourishing.

To make oatmeal porridge, boil up 1 pint water, then sprinkle in 3 oz. oatmeal, stirring all the time to prevent burning. Continue stirring until the mixture is smooth and creamy, then add salt to taste and let the porridge cook slowly at the side of the fire for about 45 min. Stir occasionally to prevent sticking, and add more boiling water if necessary. Serve in porridge plates or soup plates.

Porridge made with wheat meal requires about 1½ handfuls to each cup of water. The meal is sprinkled into boiling water, salt being added to taste. Stir till smooth, then allow to cook gently 40 to 50 min. Porridge is also made with barley meal and oatmeal. The method is similar, the oatmeal being sprinkled into boiling water, allowed to boil for 10 min., then the barley is sprinkled in finely through the fingers and table salt added. This form of porridge is best taken with cream. As it helps to purify the blood, it is said to be good for the complexion.

PORRINGER. A porringer was originally a vessel used for holding porridge. Though it is sometimes known as a caudle cup, strictly speaking a caudle cup has a lid and is bellied,



Pork Pie. Raised pie mould with hinged side to facilitate the removal of the pie when cooked. On the left of the illustration the mould is shown open.

or rather squat, in shape. A porringer proper is bellied, with fairly straight sides. Porringers were made in silver, pewter, and Sheffield plate, and good examples are much sought by collectors. They are known to have existed in the 16th century, and the lion and unicorn pattern appeared after the Restoration.

The best porringers were made from 1660 to the time of Anne. Examples are freely decorated with acanthus and roses. Repousse is used for decoration with, in some cases, a little chasing by way of relief. 17th century specimens are found with fanciful devices of animals, birds, and flowers thereon; but with the accession of William III, Dutch influence was exercised in the direction of simplicity, and the flute and the gadroon appeared. See Pewter; Silver.

PORTABLE RADIO SET. This is a completely self-contained receiver which can be carried about and operated without the necessity of external batteries or aerial and earth connections. A frame aerial is used, and this is generally wound round the chassis of the instrument or fitted to the back of the cabinet. In some instances, sockets are provided for an additional and external aerial and an earth connexion so that it is possible to increase the range of reception if desired.

A frame aerial (q.v.) is directional in its qualities and it is, therefore, desirable for a portable set to be fitted with a turntable in its base so that it can easily be swung round into the best position for receiving any particular station.

A large proportion of the weight of a set of this kind will be due to the high tension battery and the L.T. accumulator. Special H.T. batteries are made for portables providing the greatest current capacity for a given weight, and the circuits are designed and valves chosen for a minimum consumption of H.T. compatible with an adequate performance.

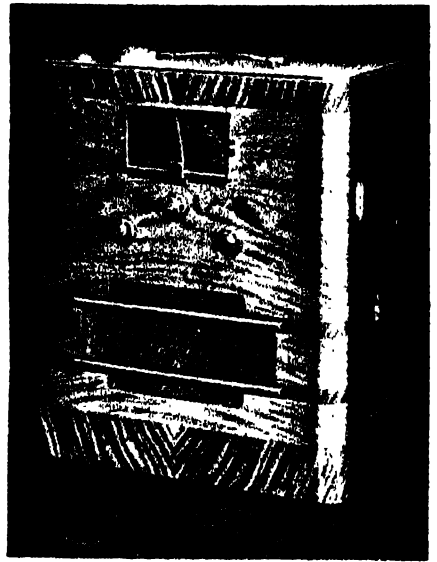
When a portable set is not in use it is advisable to remove the batteries, as the sulphuric acid and other chemicals employed in them are liable to cause corrosion of the internal metal parts of the set. During such periods of rest the accumulator must be kept charged. If this is not done sulphation may set in.

Unspillable accumulators of two kinds are made for portable wireless sets. The one is known as the "free

acid" type and is designed on the principle of the unspillable ink-well. This is to be preferred to the type containing a "jelly acid." Most portables can be laid down on their sides or even stood upside down without any harm resulting to them while they are kept stationary. When they are being carried by road or railway they should be kept upright or the valves may fall out and be damaged, although in some cases protective packing is provided to guard against this happening. Even so, it should be remembered that the most carefully designed portable can possess only a limited degree of robustness. Constant rough handling is bound to result in damage occurring.

When choosing a portable radio set these are the points which should be borne in mind:

1. **Quality of Reproduction.** With the special valves, loudspeakers and circuits available to designers, it is possible to achieve a quality almost equal to that of a good table set. There must, however, be some loss of quality consequent upon the reduction of the weight and size of loudspeaker and its restricted cabinet accommodation. A further restriction is the limiting of the H.T. current consumption to a practical value. The higher musical notes and speech should, however, be clear; the bass will largely be in the bass.



Portable Radio Set. An "Ever Ready" trans-portable set, capable of receiving a number of programmes without the aid of an external aerial or earth.

2. **Range of Reception.** A portable set using four valves should be capable of providing a number of programmes without the aid of any external aerial.

3. **Selectivity.** It should not be necessary to rely to any great extent on the directional qualities of the frame aerial in the set (by twisting the set round) in order to separate most of the more powerful broadcasting stations.

4. **Effect of Vibration.** Owing to the closeness of the valves and tuning components to the loudspeaker in most portable sets, "microphony" is sometimes encountered. This is evinced by a howl when the set is working at great volume, or at least considerable distortion. The set may also be sensitive to external mechanical vibration. Careful choice of valves and skilful general design are necessary to avoid this bad effect. The assembly of a portable must be carried out on sound engineering lines or the vibration to which it is subjected when being transported, and the sound vibrations from its loudspeaker concentrated in its compact construction will inevitably result in loose connections and other such faults. See Broadcast Receiving Sets.



Porringer. Silver porringers, dating, left to right, from 1694 and 1713. Courtesy of Chapple & Mantell.

PORTER: The Drink. This name is given to the dark-coloured malt liquor similar to but thinner than stout, and not so frequently used. See Stout.

PORTLAND CEMENT. Portland cement is so named because of its resemblance in colour to Portland stone. It is made by the intimate mixing of calcareous and argillaceous materials such as limestone and clay, in certain definite proportions. Portland cement should always be of the British standard specification. See Brick, Cement, Concrete, Rendering.

PORTRAIT ATTACHMENT. A small lens known as a portrait attachment, or magnifier, is attached by screwing to the lens

mount of a Kodak or other folding camera to increase the focal length, for taking portraits. With the ordinary lens alone nothing nearer than about 15 ft. to 20 ft. is in focus, so that portraits of sufficient size on the film or plate cannot be obtained. The portrait attachment by lengthening the focus of the lens, allows the camera to be brought within 8 ft. or 10 ft. (not nearer) of the person to be photographed.

Another use for the portrait attachment is to get photographs of buildings and objects in confined spaces where it is impossible to get the whole of a building within the limits of the focussing screen without tilting the camera, and so producing distortion. See Lens.

the subject screw up his eyes and wrinkle the forehead. A tree, wall fence, or other object on one side of the sitter will help to give the necessary side lighting and greatly improve the modelling. Lighting from above also needs consideration, for if it is too strong the eyes will be shadowed by the forehead and hair and give a crowing effect.

If the top lighting is too harsh a screen can be rigged up with an old sheet stretched horizontally 2 or 3 ft. above the subject's head. A camera with a focussing screen enables all these effects to be studied. Much can be learned if a good-sized sculptured bust or plaster cast is used for experiments and for trial exposures.

Great care is necessary in the choice of a background. It must not be full of detail sharply rendered, or the interest will be divided. A neutral background should be chosen if possible. If it is in deep shadow without high lights, the portrait will be thrown up well. A simple and effective background is provided by a sheet stretched on a clothes horse. Whatever its nature it should be well out of focus.

Another point is to see that there is no incongruous object, such as a bush or tree trunk, immediately behind the sitter.

Whenever possible use orthochromatic or panchromatic plates or films. Apart from questions of colour in the dress, freckles or slight rednesses or other blemishes in the skin, hardly noticed by the eye, are greatly exaggerated by ordinary plates on account of their insensitiveness to red. With colour sensitive plates these characteristics are reduced to their proper proportion and retouching, a matter hardly within the capacity of the average amateur, is avoided.

The pose of the sitter should be attended to carefully, but without making him adopt unnatural or uneasy positions which will give the effect of strain. Do not let him sit in a slovenly attitude, but reasonably upright with the chin held up a little and the eyes looking very slightly to one side for a full face portrait. The camera should be so arranged that the lens is about level with the chin. The face should be studied to ascertain whether full face, side face, or profile gives the most characteristic and pleasing likeness.

Indoor portraiture is somewhat more difficult than outdoor work. Much more careful control of the lighting is both necessary and possible and

PORTRAITURE: IN PHOTOGRAPHY

Simple Rules for Good Results in Amateur Work

Continuing the sequence of our photographic articles, our contributor deals here with the taking of portraits. Other entries that bear upon this subject include Orthochromatic, Panchromatic. See also Camera, Enlarging, Lens, Photography, Spotlight.

Of all branches of amateur photography portraiture is probably the most difficult. Much can be done with the ordinary snapshot camera, particularly if it be clearly recognized that it is not designed for portrait work, and its use is mainly confined to out-of-doors portraits taken with the subject some distance from the camera. For indoor work a stand camera is essential. To get satisfactory results with a fixed focus camera an extra lens, called a portrait attachment (q.v.) or magnifier should be used.

With the ordinary lens the figure will be too small on the plate or film, even for enlargement, since if the sitter is brought near to the camera he will be out of focus and the perspective will be distorted. Even with a portrait attachment the sitter should not be less than 8 ft. or 12 ft. from the camera. This will give a somewhat small image on the plate, which, however, can be enlarged satisfactorily.

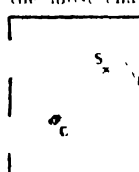
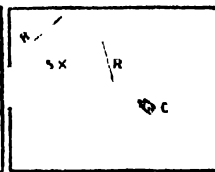
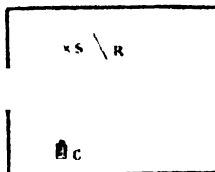
To obtain a large image on the plate, such as is seen in professional portraits, a lens with a long focus is necessary. For a $\frac{1}{2}$ -plate camera an 8 in. or 10 in. lens will give good results. Its definition may not be perfectly sharp, and its depth of focus will be small if, as should be the case, it is of fairly large aperture. These qualities, however, are advantages in portrait

work, giving soft, rounded pictures. Thus an old single landscape lens will serve excellently. If the lens of the camera in use is what is known as a doublet

consisting of two separate lenses, one of which can be screwed out, it will be found that using the back lens only will give the extra focal length required, i.e. enlargement of the image although it will have the effect of reducing the aperture and therefore increasing the exposure. The next consideration is shortness of exposure. Naturalistic portraits cannot be obtained if the sitter has to keep a rigid position for more than a fraction of a second. This is one of the reasons why the amateur snapshot portrait is often more pleasing than some professional portraits. Short exposure is obtained by using a fast lens, i.e. working at an aperture of f/6 or less, fast plates or films (such films as the Kodak 'Verichrome' used with a pale filter can be made to give good results), and strong light. Outdoor light is the strongest, and therefore best for amateur portraits, although it has the disadvantage that it cannot be controlled.

For outdoor work avoid full front lighting, and place the sitter so that the light is stronger on one side than the other. With the sitter facing the strongest light squarely, all modelling in the face will be lost and the portrait consequently untrue and uninteresting. For similar reasons full sunlight is usually unsatisfactory apart from the fact that it makes

lenses in portrait work, giving soft, rounded pictures. Thus an old single landscape lens will serve excellently. If the lens of the camera in use is what is known as a doublet



Portraiture. Fig. 1. Result obtained with lighting from one window. Fig. 2. Reflecting screen added, with improved lighting of head and face modelling. Fig. 3. Picturesque lighting effects obtained with background screen and arrangement of reflector and camera. Fig. 4. Good effect with lighting from two windows and reflector. The diagram above each photograph shows the arrangement of camera (C), sitter (S), reflector (R), and window lighting used.

Specialty photographed by E. O. Hoppe



Portugal Laurel. Evergreen flowering tree attractive for the garden shrubbery

effects can be obtained which are impossible outdoors. Longer exposures are required, but this difficulty can be partly overcome by the use of very fast plates, or of panchromatic plates without light filters.

The tendency with indoor amateur portraits is towards harshness of lighting. This is avoided by using a room with a good-sized north window, or, better, with two windows, the lower part of the whole lightly screened with lace or muslin curtains, or other white translucent material, to soften and diffuse the light. The subject should be placed near, but not too close, to the window, and a reflector on the other side (Figs. 2 and 3). This lights up the portions of the face and figure otherwise in shadow. A reflector can be contrived with a large sheet or white paper hung on a clothes horse or a line that can be moved about. The positions of screen and camera are best found by experiment. Suggestions are given in Fig. 1-3, which show three possible arrangements in a room with one window, and in Fig. 4 for a room with two windows. Very interesting effects can be obtained with the reflector placed in front of the sitter, the camera lens pointing through a hole cut in the reflector.

If the top light is too strong, it can be regulated by short curtains on rods hung at the top of the window.

The background in an ordinary room should be carefully considered. It is usually best to contrive a simple background out of some unpatterned material not too light in colour hung on a line stretched across the corner of the room and kept out of focus. If the ordinary room furniture constitutes the background take care that no prominent lines of furniture, picture frames, etc., pass directly behind the sitter's head, and also that the glass of pictures, or other bright objects, do not catch the light, thereby making a glaring white blob in the photograph.

The head should not be central in the plate unless a full-face front-figure portrait is being made. With side face, or profile, much more

pleasing results are obtained with the head on either side of the middle line of the plate.

Exposure should always be checked with an exposure meter, except when artificial light is used, when actual experiment alone can decide, according to light, lens, and plate used. Development should be deliberately on the thin side, either using the ordinary developer diluted with one-third the amount of water extra to the ordinary amount, or by shortening the time of development. Over-development will entail loss of modelling and harshness without any gain in detail. For most portraits rather broad effects are best, and these are given by thin negatives which are printed or enlarged on matt or rough papers.

PORTUGAL LAUREL. This vigorous evergreen (*Prunus lusitânica*) forms an attractive tree if allowed to grow naturally and bears white flowers in summer. The best time to plant is in September or early May, and it is wise to put in small trees as large ones can rarely be transplanted successfully.

PORTULACA. The dwarf-growing portulaca is a S. American annual flowering plant of low growth. It is raised from seed sown in pans in a cold frame in early spring and planted out in June. Sowing may be made in the open ground in May. The flowers are crimson, pink, white, and yellow. They need light soil and a sunny place.

PORT WINE. There are three classifications of port: vintage, ruby, and tawny, of which particulars are here given.

Vintage Port. Vintage port is wine of a particular year, shipped, as a rule, from 2 to 4 years after it is made, bottled in Great Britain, and allowed to mature in cellars. It matures slowly and improves with age. Only those years in which conditions have been favourable to the perfect ripening of the grapes are known as vintage years.

The purchaser of vintage port should take care that the wine has been shipped by a reliable shipper in the first instance, and bottled by a good wine merchant. The purchaser should always assure himself of the bottling date before taking delivery. The most economical plan is to buy vintage port early, as soon as the wine merchant has bottled it. The wine should then be laid down in the cellar for keeping purposes. Ten years in bottle is a fair age, although the wine may improve up to 20 years or more.

Vintage port is known by its character, full, fruity flavour, colour, and fine bouquet. In the process of maturing in bottle a crust is formed, and the wine should be carefully decanted, the white splash on the end of the bottle being kept uppermost. The decanter should be perfectly dry and clean. The bottle must not be shaken, nor the sediment allowed to pass into the decanter. If the cork breaks, the wine should be poured into the decanter through a strainer or piece of muslin.

Port bought for immediate use from wine merchants should be stood upright for 24 hours in the dining room to enable the crust to settle, and so that the wine acquires the temperature of the room. Port should be decanted at least 2 or 3 hours before drinking, as the wine develops in bouquet and flavour.

Other Ports. Tawny port is not a wine made from any one special year's grapes, but a blend of wines of a number of years. It is matured at Oporto in wood instead of in bottle, and consequently loses its deep red colour. It is a lighter wine, both in colour and body, than vintage port.

Ruby port is a compromise between vintage and tawny. It may be a wine of a particular vintage kept in wood for some time before being bottled so that it has lost some of its depth of colour and strength; or it may be a blend of wines of different years blended at Oporto or in Great Britain by wine merchants.

The percentage of alcohol in port wine is from 15 to 20 per cent. When more than 15 or 16 per cent of alcohol is present, the wine has been fortified, that is to say, spirit has been added to it. Much cheap wine sold under this name may be nothing but a mixture of potato or grain spirit coloured and flavoured with dyes and essences. Natural port is a wholesome beverage, but the artificial compounds may be extremely injurious. Port wine is combined with malt or malt extract in some tonic preparations. See Alcohol, Wine.

Port Wine Mark. See Birthmark.

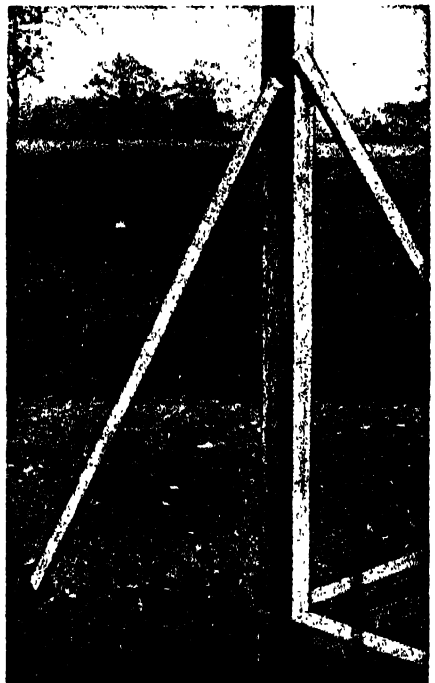
POSITIVE. In photography a positive is the reverse of a negative, and may be made, as is most usual, on paper or on glass, when it is seen by transmitted light instead of by reflected light, as in the case of a print. A glass positive is generally known as a transparency. It may be for use as a lantern slide or a colour transparency.

Ordinary transparencies are made for the purpose of copying negatives by contact. A slow plate is best. See Colour Photography: Negative.

POST. A post is a piece of timber, metal, or other material usually fixed in a vertical position and used as a means of support or attachment.

The majority of fences are constructed of posts made in wood, cast or wrought iron, or concrete, set at a distance apart, the intervening space being filled with rails, palings of wood, chains, stout galvanized iron wire, or barbed wire. In the latter two cases a stouter post, called a straining post, is often placed at certain distances, incorporating a drum with a ratchet device for tightening the wire. An example of a concrete straining post braced with a strut is illustrated in the article on Fence, page 447.

A gate post has to carry a heavy weight, and often needs a support on the opposite side to the gate. Since a gate sinks if the post falls even slightly out of the vertical, it



Post. How a corner post is erected in the course of constructing any small building

is advisable when erecting the post to ensure a perfectly sound foundation. Where the gate post is of wood, it should be well creosoted or treated with some other form of wood preservative, to prevent rotting. See Clothes Line: Fence; Gate.

POSTAGE: RULES AND REGULATIONS

A Concise Guide to Matters of Everyday Concern

This article contains information about the dispatch of letters and postal packets of all kinds. Branches of the subject are dealt with under the headings Money Order, Parcel Post, Post-card. See also Letters, Parcel, Telegram.

The cost of sending letters, papers, cards, newspapers, etc., through the post is met by purchasing stamps and fastening them to the letter, card, or wrapper. Parcels, not exceeding a certain weight, can be sent in the same way.

The communications that are sent through the post may be divided into four classes: letters proper, this including letter cards and letter packets; postcards; newspapers; printed papers of other kinds.

Letter Rates. A letter may be sent to any part of the British Isles, including Eire, for 2½d. provided it does not exceed 2 oz. in weight. If it does exceed 2 oz. in weight, it will cost an extra ½d. for the next 2 oz., and for every additional 2 oz., 1d. Thus a letter weighing 3 oz. will cost 3d., and one weighing 5 oz. will cost 4d.

A letter if posted unpaid is charged on delivery with double postage; if posted underpaid, with double the amount of the deficiency.

Postage stamps can be bought from any post office. They are sold in the following values: ½d., 1d., 1½d., 2d., 2½d., 3d., 4d., 5d., 6d., 7d., 8d., 9d., 10d., 1s., 2s. 6d., 5s., and 10s.

An assortment of ½d., 2d. and 2½d. stamps is provided in the form of books priced 2s. 6d. and 5s. Various items of stamped postal stationery are also sold.

Redirecting Letters. Any kind of postal packet can be redirected to the same person at another address under certain conditions. This privilege is necessary when persons remove from one house to another. It is also very useful when families go away for the summer holidays, and during other absences from home. It can be done either by someone authorised by the person to whom the letter is addressed, such as a relative or caretaker (not later than the day after delivery), or by an official of the Post Office. The redirection of letters by the Post Office is free for 6 months; thereafter a charge of 1s. for 12 months, and 5s. for each subsequent year is made.

The postal authorities undertake to redirect letters, postcards, etc., only when such cannot be redirected at the place of address. They do not, for instance, redirect postal packets addressed to a person who has temporarily left his house, unless the house is left uninhabited; or those addressed to clubs, hotels, boarding houses, or lodgings.

Notices of removal and applications for redirection must be signed by all the persons to whom any packets to be redirected are to be addressed. Thus, in case of a removal, all the members of a family who have any reason to expect letters must sign, not the head of the house only. Printed forms for this purpose can be obtained from the local post office or from a postman, and when filled up and signed should be sent to the postmaster or handed to the postman.

Registered Letters. Letters which contain money or articles of value should be registered, and if this is done compensation will be paid by the Post Office, subject to certain conditions, in the event of loss or damage. Any letter, parcel, or other postal packet can be registered. Anything intended for registration must be handed to an official of the Post Office, and a certificate of registration, bearing an acknowledgment that the necessary fee has been paid, must be obtained. Nothing intended for registration should be dropped into a letter box.

The minimum fee for registration is 4d. exclusive of postage. This insures an inland packet up to £5, so if it is worth more than that

sum a higher registration fee should be paid. The fees and limits of compensation for inland packets are as follows:

Fee	Compensation	Fee	Compensation
4	20	1/5	220
5	40	1/6	240
8	60	1/7	260
10	80	1/8	280
11	100	1/9	300
1/1	120	1/10	320
1/2	140	1/11	340
1/3	160	2/1	360
1/4	200	2/2	400

No compensation in excess of £400 is paid.

A packet intended for registration must be made up in a reasonably strong cover appropriate to its contents. Letters and parcels must be fastened with wax, gum, or other adhesive matter. It is not sufficient merely to tie a packet with string, but if it is tied with string in addition to the fastening, the string need not be sealed.

If it is desired to secure compensation in the event of damage to a fragile article sent in the letter or parcel, the packet should bear the words, "fragile, with care." These words should appear on the face of the cover, above the address. Any official to whom a packet is tendered for registration is instructed to refuse to register it if the packing is, in his opinion, obviously inadequate. Compensation will nevertheless be refused if, though accepted, the packet is afterwards found to have been imperfectly packed. When several packets are sent for registration by the same person it is desirable for a list of the addresses in duplicate to be sent with them: one copy is kept by the post office and the other is signed and returned to the sender. The sender of any registered postal packet may arrange at the office of posting, either at the time of posting or subsequently, for an advice of its delivery to be sent to him. The fee is 3d., payable by means of stamps affixed by the sender to a form provided for that purpose.

Packets that contain coin or jewelry, and also all packets for inland postage bearing the word Registered or any other word, phrase, or mark to the like effect are, if posted otherwise than in accordance with the regulations, subject to compulsory registration and are charged on delivery with a registration fee of 6d. less any amount prepaid in excess of the postage.

Any packet which is found open in the post or cannot be delivered, and which is found to contain an uncancelled postal order in which the name of the payee has not been inserted, a cheque or dividend warrant not crossed or made payable to order, a banknote, postage stamps, or any articles, other than coin or jewelry of a value in each case of 10s. or over, will be subject to registration and be charged with a registration fee of 6d. No compensation will be given for any postal packet that has been compulsorily registered.

Compensation in respect of money of any kind, coin, banknotes, postal orders, cheques, stamps, etc., will be paid only in those cases in which the money is enclosed in one of the registered letter envelopes sold by the Post Office, and the packet is tendered for transmission by registered letter post. The compensation paid in respect of coin, which must be packed so that it cannot move about, will in no case exceed £5.

Printed Papers. For printed papers the prepaid rate of postage is 1½d. for 4 oz. or fraction thereof (Imperial and foreign) and ½d. for each

additional 2 oz. or fraction thereof (inland). Maximum weight is 2 lb. Printed paper falls into the following six classes:

(1) Commercial or business papers of a formal character, namely, invoices, orders for goods or for work, confirmations of orders, advice notes of the dispatch or receipt of letters, documents, goods or money, waybills, bills of lading, receipt for goods or money, statements of account, price lists, prices, current market reports, delivery and shipping notes, tenders for goods or for advertisements, quotations for goods, estimates for work, inquiries for quotations, contract notes, confirmations of contracts, share transfer notices and applications for employment. Notices of assessments and applications for payment of rates, notices relating to the registration of voters, notices, certificates, reports and returns given or made to or by public bodies, lists and tabular statements.

(2) Proposals and policies of insurance, powers of attorney, proxy papers, licences, voting papers, testimonials, and certificates.

(3) Circulars, that is, printed notices and letters.

(4) Printed Christmas, New Year, Easter birthday, picture, greeting and visiting cards.

(5) Manuscript for Press and printed proofs (including information for insertion in directories and similar publications) with corrections and instructions.

(6) Educational exercises and examination papers with comments, corrections and instructions.

Such documents must consist of a printed form and any writing refer solely to its subject matter or consist of formulas of courtesy or of a conventional character, not exceeding five words or initials.

As every printed paper is liable to examination, it must be posted in a cover that can be easily removed for the purpose of examination without breaking any seal, tearing any paper, separating any adhering substance, or cutting any string. No printed paper may contain or bear any communication in the nature of a letter.

No paper money may be posted or conveyed or delivered by post in a printed paper. A stamped proxy paper or a stamped and addressed card, wrapper, label or envelope forwarded in order that such card, wrapper, label, or envelope may be returned through the post is, however permitted. A packet prepaid as printed paper, but which contains an enclosure of any kind, is not admissible at printed paper rate.

Newspapers. Newspapers can be sent through the post at special rates provided such newspapers have been registered at the General Post Office. If this has been done, the words "Registered for transmission through the post" will usually be found thereon. The rate of inland postage on publications registered in this way is 1½d. for every copy not exceeding 4 oz., with a further charge of ½d. for every additional 4 oz. or fraction of 4 oz. Imperial and foreign newspaper rates are as for printed papers.

The rate is per copy; so if two or more copies are sent in a single packet each is liable to the same postage as if posted separately. But in no case will a copy or a packet of such copies be chargeable with a higher rate than that chargeable on a printed paper of the same weight. A copy or a packet of copies posted unpaid or underpaid is chargeable on delivery with double the deficiency at the newspaper rate or printed paper rate, whichever involves the lower charge. No copy or packet of copies may weigh more than 2 lb.

Every newspaper sent through the post should be so folded and covered, if a cover is used, as to admit of the ready inspection of the title. Every copy or packet of copies must be posted either without a cover or in a cover open at both ends, which can be easily removed for the purpose of examination. No copy of a newspaper sent by post at newspaper rate may bear on the paper itself or on the wrapper any writing except the name, address, and description of the person to whom it is sent, the name of the sender, the words "With compliments," and a request for its return in case of non-delivery.

No unregistered publication and no article that is not part of a publication registered as a newspaper or a supplement thereto may be enclosed in any packet sent at newspaper rate. No supplement to a publication registered as a newspaper is admissible at the newspaper rate unless it is sent through the post with the publication to which it is a supplement. If any of these regulations are infringed, the packet will be charged, either as an underpaid printed paper or an underpaid letter, or is transferred to the parcel post and charged with a fee of 1d. in addition to any deficient parcel postage, whichever involves the lower charge.

Other Points. If a postal packet which is chargeable with a postage exceeding 1d., whether a letter, newspaper, printed paper, or parcel, cannot for some reason be delivered at the place to which it is addressed, it is returned direct and unopened to the sender, provided it bears on the outside his or her name and address. If this is not thereon, the packet is opened by an official of the Post Office, and if it contains the sender's address it is returned thereto. An undelivered postal packet which cannot be returned to the sender and contains no enclosure of importance is destroyed.

Any person who desires proof that an unregistered letter, letter card, postcard, printed paper, or newspaper has been posted to a particular person should hand in the letter or card at a post office and ask for a certificate of posting. The fee for this is 3d., payable by means of a stamp, which the sender fixes to the certificate. A letter which contains anything of a fragile nature should be labelled *Fragile*.

In towns, where post offices or letter boxes are found in almost every street, the postmen are not allowed to accept anything for the post, but in country districts it is different. There, subject to certain conditions as to weight, etc., a postman must accept any letter, parcel, or other postal packet handed to him on his round, whether intended for registration or not.

Reply coupons, for the purpose of prepaying replies to letters, are sold at the chief post offices, and are exchangeable abroad for stamps representing a minimum Imperial or foreign letter postage. Price (valid in foreign countries of the Postal Union, &c., valid within the British Commonwealth only, excluding Anglo-Egyptian Sudan), 3d.

Railway Letters. In Great Britain, British Railways will accept and convey letters both on weekdays and Sundays by the next available train or ship, either to be called for at the station of address or to be transferred to the nearest letter box. These are called railway letters and must not exceed 1 lb. in weight and must be taken to a passenger station of British Railways, during such hours as the station is open to the public, and tendered to a railway servant. Postage at the inland rate must be prepaid by putting stamps on the cover in the ordinary way. In addition, a railway fee, which must be paid in cash to the railway servant, is chargeable upon each railway letter as follows:

Weight not exceeding 2 oz.	7d.
Over 2 oz. and not exceeding 4 oz.	1s.
Over 4 oz. and not exceeding 1 lb. (maximum)	1s. 6d.

Nothing further is payable on delivery. For the *Railway Service*, see *Express Delivery*.

Mails by Air. Any kind of letter packet may be sent by air mail, that is, letters, post cards, printed papers and commercial papers, and samples. The limits of size and weight are the same as for similar correspondence sent by ordinary post.

Numerous air letters, and ordinary air mail letters and postcards (at varying postage rates) can be sent to civilian addresses in many overseas countries. Full particulars of these services are given in the current air mail leaflet,

obtainable at any post office. Air letters must be written on one of the special air letter forms obtainable at post offices, price 6d., or on privately printed forms which have been approved by the Postmaster General. If privately printed forms are used, stamps to the value of 6d. must be affixed before posting. A blue air mail label (obtainable free at any post office) must be affixed in the top left-hand corner of the address side of each air mail letter or postcard.

Air mail surcharge services are available on each weekday for first-class correspondence (letters, letter packets, and postcards) in both directions between Great Britain and Northern Ireland and between Great Britain and Eire. Correspondence intended for conveyance by this service must be prepaid with a fee of 2d. for each 2 oz. or fraction, and 5d. for each postcard in addition to the ordinary inland postage rate.

Stamps to the full value of the combined postage and air fee must be affixed at the top right-hand corner of the address side of the envelope. If the proper fees are not prepaid, the packet cannot be sent by air mail. The combined postage and air fees for correspondence for countries outside Europe are for a weight of half an ounce.

POSTAL ORDER. Postal orders may be purchased at, and are payable at, most post offices in Great Britain, Northern Ireland, Channel Islands, Isle of Man, and Eire. They are issued for 6d., by 6d. steps up to 5s., then for 6s., 7s., 7s. 6d., 8s., and by 1s. steps up to 21s. A poundage of 1½d. is charged on orders of 6d. and 1s., 2d. on orders of 1s., 6d., 2s., 2s. 6d., 3s., 3s. 6d., 4s., 4s. 6d., 5s., and 2½d. on orders of 6s., 7s., 7s. 6d., 8s., and every multiple of 1s. up to 21s. Odd sums may be added to the value of fixed orders by affixing not more than two stamps and not exceeding 1½d. in value. Orders are cashed at a post office on the signature of the recipient on the order, or they may be paid into the recipient's bank. Crossed orders are paid only through a bank. The counterfoil should be filled in and retained by the sender. Postal orders are valid for six months from the last day of the month of issue. See *Money Order*.

POSTCARD. A postcard is a card on which a message is written and which is sent through the post. Postcards are sold ready stamped at all post offices for a little more than the cost of the stamps, while unstamped cards suitable for postcards can be bought and stamped by the sender. The inland rate of postage is twopence for every card. A postcard, if posted unpaid, is charged double postage on delivery; if posted underpaid it is charged double the amount of the deficiency. The prepaid rate of postage on every reply postcard is 4d. As regards size, a postcard may not exceed 5½ in. in length by 4¼ in. in width, or be less than 4 in. in length by 2½ in. in width. If private cards are used as postcards, their material must be ordinary cardboard or paper not thinner than that sold at the post offices for use as postcards. Picture postcards, if containing not more than five words, will go for 1½d. as printed papers. (See *Postage*.)

Nothing may be attached to a postcard except the stamps, a completely adherent gummed label or slip that folds back, bearing the name and address of the person to whom the card is sent; a similar label, not exceeding 2 in. long and ½ in. in width, bearing the name and address of the sender of the card; and engravings, drawings, photographs, and printed matter on very thin paper and completely adherent to the card. These additions may be fixed either to the back of the card or to the left-hand half of the front. The right-hand half of the front must be reserved exclusively for the address and the postage

stamps. If these rules, which are intended mainly to allow picture postcards to go through the post, are not observed, the postal authorities may refuse to deliver the card, as they are officially entitled to do.

A postcard may not be folded, nor may it be bent or altered in such a way as to reduce its size below 4 in. by 2½ in. It must not be fastened against inspection in any way, nor enclosed in a cover of any kind. If these rules are broken the card will be treated as a letter and will be charged accordingly.

Postcards can also be sent to destinations outside Great Britain. Generally speaking, the rules are the same for these as they are for inland postcards. The rate of postage for postcards prepaid for all destinations abroad, except for H.M. Forces and ships of war is: single 2½d.; reply-paid 5d. The material of the card must not be less than 1½ in. thick.

Postcards are afforded the same means of transmission as letters, and consequently to many countries they are forwarded by air in ordinary course (see under *Postage Letter Rates*). They may be sent by air to most other countries on payment of the special air postage rates set out in the air mail leaflet. An unpaid postcard from abroad is charged on delivery with double postage; if underpaid, with double the deficiency. Any card can be stamped and used as a postcard for the foreign and colonial post provided it is of cardboard similar to, but not thinner than, that used for the cards sold at the post offices for use as postcards. They may not exceed 5½ in. in length by 4¼ in. in width, or be less than 4 in. in length by 2½ in. in width.

Postcards for abroad must bear on the face the heading *Carte postale*, or the equivalent of the heading in another language. This heading, however, is not obligatory for single postcards that have been manufactured privately. Reply-paid postcards must bear on the face in French, as a heading on the first half, the words *Carte postale avec réponse payée*; on the second half, *Carte postale réponse*. Each of the two halves must, moreover, comply with the other conditions laid down for single postcards.

Official postcards sold for inland postage may be used for destinations outside the United Kingdom if they bear a postage stamp for the additional postage required. This concession does not apply to reply-paid cards. A postcard must be sent unenclosed, that is to say, without wrapper or envelope.

Although it is forbidden to join or attach to postcards samples of merchandise or similar articles, yet illustrations, photographs, stamps of any kind, address labels, and cuttings of any kind may be affixed to them, provided that these articles are not of such a nature as to alter the character of the postcard, that they consist of paper or other very thin substance, and that they adhere completely to the card. With the exception of address labels or slips, these articles may only be affixed to the back, or to the left-hand half of the address side.

POSTE RESTANTE. This name is given to a post office where postal packets of all kinds may be addressed and left until called for.

When letters, etc., are addressed to a person at a *poste restante*, the words, *To be called for*, or *Poste restante*, should appear in the address. The *poste restante* is intended solely for the convenience of strangers, who, however, must not use it for more than three months consecutively in one town. Postal packets addressed to initials or to fictitious names, or to a Christian name, without a surname, are not taken in at a *poste restante*.

Postal packets may not be re-directed from

one poste restante to another in the same town, or from a private address to a poste restante in the same town. For this purpose the London postal districts are considered as different towns. All persons applying for letters at a poste restante must supply proof of identity. Re-direction from a poste restante is limited to 14 days, unless otherwise arranged.

Postal packets from abroad will be kept at a poste restante for a period of two months, and those from within the United Kingdom for a fortnight. Letters addressed to a post office at a seaport town for a person on board ship expected to arrive at that port are kept for two months. At the expiration of these periods postal packets will be treated as undelivered. If, however, one bears a request for its return within a specified time, not exceeding the official period of retention, it will, if not delivered, be dealt with in accordance with such request. See Postage.

POT. A pot is a general term for a vessel for holding food, both when cooking and at other times. The word, however, has been superseded largely by the special names given to the various utensils, although it remains in mustard pot, pepper pot, and stock pot, and in the words pot-hook, potherb, and pottery. Another pot is the flower pot, and potting is a familiar term among gardeners. See Flower Pot; Mustard; Pepper; Potting; Stock Pot.

Pot Plants. Plants grown in flower pots are chiefly relied on for the decoration of the conservatory and greenhouse, and by making a selection of suitable kinds a succession of bloom can be assured all the year round.

Those of chief value for summer and autumn flowering in the amateur's greenhouse are tuberous begonia, yellow arum lily, fuchsia, zonal geranium, begonia imperialis, campanula isophylla, herbaceous calceolonia, petunia, chrysanthemum, hydrangea, marguerite, heliotrope, lilies, nerine, Scarborough lily or valleta and various annuals.

For winter and spring flowers reliance must be placed on daffodil, hyacinth, paper white narcissus, tulip, Chinese and other primulas, Persian cyclamen, stocks, azalea, arum lily, cineraria and perpetual flowering carnation, together with various shrubs which may be forced into bloom. Suitable foliage plants are ferns, palms, india-rubber plant (Ficus elastica), aralia sieboldii, araucaria excelsa, blue gum (Eucalyptus), grevillea robusta, isolepis gracilis (a grass-like plant for edging), ophiopogon variegata, panicum (also suitable for edging) tradescantia, asparagus Sprengeri, and smilax.

Seeds of hardy and half hardy annuals should be sown in pots in September for spring and early summer bloom and in March to provide a succession. Several seeds are sown in 5-in. or 6-in. pots and the seedlings are thinned out, not transplanted. The butterfly flower (schizanthus) is one of the best for sowing in September, but many annuals can be grown in pots.

Watering is one of the most important details in the management of pot plants; most failures are due to incorrect watering. The secret of success is not to moisten the soil until it is moderately dry, and then to fill the pot to the rim. Water should not be given again until the soil is fairly dry.

POTASH: In Medicine. Applied externally in concentrated form, potash acts as an irritant and caustic. In medicinal doses internally the action of potassium salts resembles practically that of the corresponding salts of sodium.

The sulphate, tartrate, and acid tartrate of potassium are all commonly used as saline purgatives or "salts," and may be employed in habitual costiveness. The best way to take these salts in this ailment is dissolved in half a glass or more of warm water, slowly sipped,

before breakfast. The acid tartrate is one of the ingredients of Imperial drink (q.v.), often prescribed as a cooling beverage in slight febrile states.

Potassium chlorate is commonly used as a mouth wash or gargle, the drug exhibiting an antiseptic, curative action in all kinds of sore throats, tonsillitis, and similar conditions. It should be discontinued, however, after a few days' use. An aerated water containing bicarbonate of potash makes a palatable diluent of other drinks, and is feebly antacid.

As a Fertiliser. Potash is an essential element of plant food, producing quality and dry for use as lawn dressing, or for dusting flavour in fruit, tubers, and roots. The form used is kumit, an easily soluble salt containing about 15 per cent. potash, but embodying

impurities that sometimes harm active roots if placed in immediate contact with them. It should be applied to the soil in late winter, if possible.

Muriate of potash is a highly concentrated form, and needs discrimination in its use. Sulphate of potash is a purified form of kumit containing about four times as much pure potash, and may be substituted in proportionately smaller quantity. Wood ashes, the ash of burnt prunings of trees, shrubs, and plants, are rich in both potash and phosphates, and should be carefully preserved and kept along drills before sowing such vegetables as onions, carrots, peas, beans, brotroot, etc. See Fertiliser; Manure.

POTATOES: CULTIVATION AND COOKING

Successive Steps in Preparing this Vegetable for the Table

Other articles that contain something useful about potatoes include Black Scab; Cutworm; Digging; Division; Forcing; Kitchen Garden; Manure; Trenching. See also Burgundy Mixture and for the Cooking, Chips; Frying; Hot Pot; Irish Stew; Salad; Shepherd's Pie, etc.

For garden purposes the most suitable soil in which to grow potatoes is a rich loam, a trifle on the sandy or chalky side, well drained, and in a sunny situation. If the soil is heavy it should be thoroughly dug over during the autumn and winter. Couch grass, docks, nettles, and other perennial weeds should be forked out; if there is any reason to suspect that leather jackets, wire worms, or millipedes are present, the soil should be turned over.

When the soil is sandy or open in texture it can be improved, as far as potato growing is concerned, by adding dead leaves of decaying vegetable matter. Impoverished and should be enriched with stable manure, which may be dug in during the autumn or winter or before planting in spring. Lime, say 7 lb. to the rod, is beneficial to rich garden soils.

The selection of the best varieties of potatoes for planting purposes is a matter of great importance. Some which do well in one district prove disappointing in others, and an actual trial is often the only means of proving whether a new variety is worth planting.

Planting. Early potatoes can be planted early in March. After the surface of the ground has been levelled, the sets should be put in about 9 in. apart, at a depth of 6 in. There should be a span of 18 in. between the rows. If the soil is heavy, the potatoes should not be buried so deeply.

The end of March or the beginning of April is the best time for planting the ordinary

kinds. A space of 12 to 15 in. should be left between the sets, and the rows should be from 2 ft. to 2 ft. 6 in. apart. If plenty of ground is available, the potatoes may be inserted at 3 ft., and catch crops grown in between the rows. They may be planted either whole or in pieces, according to the number and quality of the eyes or shoots.

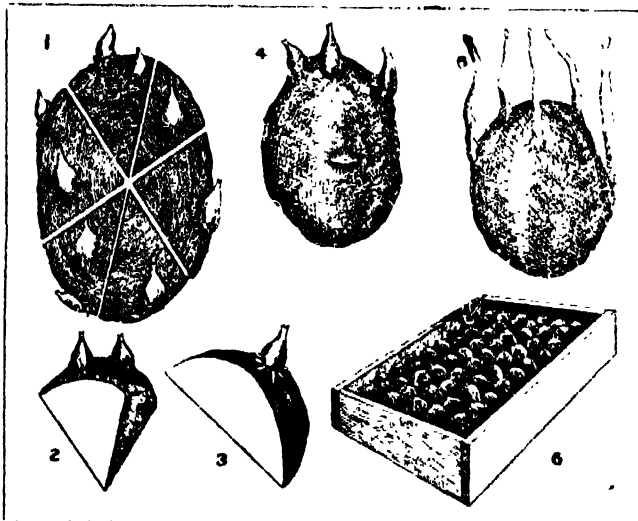
When the potatoes are about 9 in. high they should be earthed up. Sufficient soil is banked up to cover any young tubers that may be growing near the surface.

Growing Under Glass. Potatoes may be grown under glass where bottom heat is available. A frame or pit should be prepared early in January with a good bed of manure or leaves. This is covered with about 1 ft. of soil, and the potatoes planted about 6 in. deep. Plenty of fresh air should be given in mild weather, and tepid water. No earthing up is required. The potatoes will be ready early in May. A few radishes may be forced in between the rows if desired, in which case the turnip rooted sorts are the best to employ.

Digging. As regards the digging or lifting of potatoes, growers are prone to lift early ones too early and late ones too late. The bulk of the earlies ought not to be lifted until the tubers have got at least to the size of a hen's egg and the tops have changed colour. If they are lifted too early the crop will suffer from loss of weight or of starch, the substance which gives the tuber its nourishing

value. Exposure to the ground for a few hours is desirable, as it allows for setting the skins. There are few cases in which potatoes lose by being lifted before Michaelmas and there are many in which they gain. It is well, if possible, to lift them when the soil is comparatively dry, as they will then come up fairly clean. Late potatoes lifted in September may as a rule, be on the ground for 20 hours, provided the weather is not too wet.

Potatoes for Seed. For seed, potatoes of a suitable size can be bought, or they can be saved from a previous crop, provided it is a good one. It is not desirable to plant the



Potato. Method of preparation for planting. 1. Large tuber divided. 2 and 3. Divisions ready for liming. 4. Well-sprouted tuber with superfluous eyes removed. 5. An ill-sprouted tuber with weak useless shoots. 6. How the tubers are arranged in a box for sprouting.

very small potatoes known as chats, or the largest tubers, except in the case of first early varieties, when cutting should be avoided. As potatoes lose their vitality if grown continuously in the same locality, frequent change of seed is recommended; experience has shown that it is desirable to obtain seed tubers from a district farther north than that in which they are to be planted. Some growers obtain new seed tubers every second year from Scotland. In the warmest and driest districts of the country a change of seed is advisable every year.

Growers who wish to provide their own seed tubers should set aside a portion of the crop for this purpose, lifting it before the tubers are fully ripe, as immature tubers make the best seed. They should then be selected. Clean tubers, having been selected, should be allowed to lie on sackings or on the ground for a few days, and should be turned occasionally so that they become greened. This will improve their keeping quality. In winter they should be placed with the crown uppermost in shallow trays or boxes, or on shelves one layer deep. These should be laid in a cool, frost-proof place where they will get as much light and air as possible. Tubers boxed in this fashion develop 2 or 3 strong green sprouts instead of a large number of weakly shoots, which they produce if they are pitted or kept in the dark.

Manuring. A good system of manuring consists in the application just before the time of planting of a mixture of superphosphate of lime, 5 parts, and sulphate of ammonia, 3 parts, at the rate 3-4 oz. to the sq. yd. If sulphate of ammonia is applied after the shoots have come above the ground, it should be mixed with soil so that the growing plant does not come in contact with it. The addition of a small quantity, 1 oz. to the yd. run, of wood ashes as a dressing to the soil before the sets are planted is also to be recommended. If potatoes are cut into sections before being planted, the wounded parts should be dipped into slaked lime.

Storing. For potatoes stored on a large scale a clamp or pit is almost a necessity, but other methods are possible with small quantities. A dry, frost-proof shed makes an excellent store. In this the potatoes should be spread in layers on the floor, either directly or on straw, bracken, or sacking. The depth of the layer must not be more than 2½ ft. or the tubers may become heated and begin to sprout. They should be covered with straw, litter, or sacking to keep out the light, unless they are intended for seed.

They should be inspected 10 days after they have been put in store, and diseased potatoes removed. The shed should be ventilated whenever possible or desirable. A watch must be kept for rats and mice, and every care taken against frost. One effective method



Potatoes in various stages of growth, illustrating how the tuberization is effected
Courtesy of Amateur Gardening

of doing this is to scatter litter lightly but thickly over the heap.

Where there is no shed suitable for storing, and the quantity is not too great, the tubers might be placed in stout bags and left in a larder. Quicklime, or lime and flowers of sulphur, sprinkled lightly among them will help to keep down disease. During the late autumn season they should, if possible, be looked over once a fortnight, and diseased tubers removed. In winter, old sacking thrown over the bags or sacks will protect the potatoes from frost. In very severe weather extra covering should be put on at night, and removed in the morning.

If no more suitable place is available, potatoes can be stored in a dry cellar, careful attention being paid to ventilation, particularly during the first

months. Forgrowers who are in a position to store their potatoes in a clamp or pit, the following hints may be helpful. The condition of the potatoes at the time of clamping is most important. They should be put away in a dry state, and as free from soil as possible.

Large clamps are liable to develop more heat than small ones. As a general rule it is unsafe and inadvisable for the base to exceed 7 ft., while smaller clamps are often seen. The site should be dry and well drained, and the base, if anything, should be slightly above the general level of the soil.

Having been placed in a heap, shaped like a pyramid, the potatoes must next be covered. First cover them with a layer of straw about 6 in. thick. A plank about 1 ft. broad and from 8 to 10 ft. long should be placed along the top or ridge of the heap, and the sides, to the edge of the plank, covered with an inch or two of soil. The plank is then moved along, and another length covered with soil. In this way the top of the clamp is kept free from soil, thus providing for the necessary ventilation.

The covering soil should not be put on at once. If the weather is fine and severe frost is not threatened, a full fortnight should elapse between putting on the straw and closing in with the first covering of soil, as this allows much of the heat that is produced by respiration to escape. In very wet weather the soil may be put on sooner, as it is inadvisable to close in when the straw is sodden. It may be necessary to add more soil to the sides later in the year.

Potato Diseases. Potatoes are subject to a number of diseases. The chief one is known sometimes as potato blight and sometimes as potato disease. The first sign of the disease visible to the naked eye is the appearance on the leaves of dark brown or blackish spots of irregular size and shape, on the under surface of which a delicate white mould may be seen, especially round the margin of the diseased areas. If weather conditions favour the fungus the dark coloured patches spread rapidly, and the whole of the foliage, and sometimes the stems also, soon become blackened. Potato plants badly attacked by blight give off a very distinct and disagreeable smell.

If the weather is wet after the haulm has been attacked, the tubers soon begin to be affected. Infection of the tubers is brought about by spores which, liberated from the surface of the leaf, are washed into the soil.

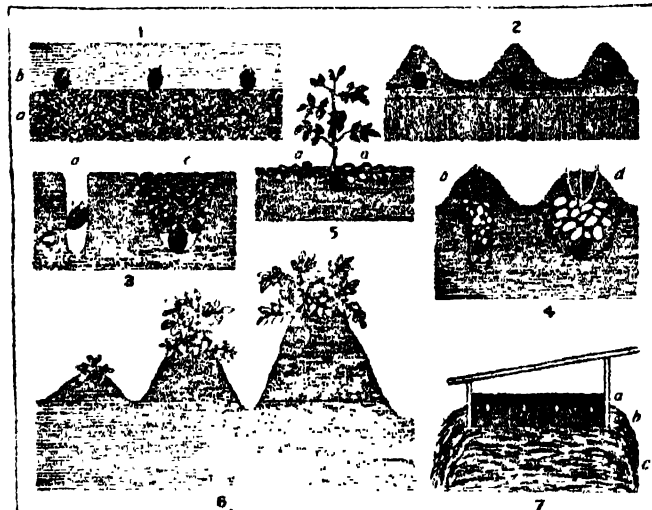
By the use of Bordeaux or Burgundy mixture in June and July the spores of the fungus are prevented from germinating and producing threads which grow into the tissues of the leaf, and hence the haulm, instead of withering, as it does when attacked by blight, remains healthy and green. Spraying must be done in good time, and if heavy rains have washed the spraying material from the leaves, the operation of spraying must be repeated.

Potatoes in store are liable to diseases. One of these is dry rot, which usually develops from December onward, becoming more severe as the spring advances.

Potato Leaf Curl. Probably no disease is more directly responsible for weakly potato plant and light crops than that termed potato leaf curl. In the lighter soils in the southern and drier part of Great Britain it is very prevalent and is particularly abundant where the practice of using locally grown seed is followed. A marked symptom is curling of the leaves.

As the disease is perpetuated by means of the seed tubers it is of the utmost importance that they should not be saved from affected plants. Not only should tubers from dwarfed or distinctly curled plants be rejected for seed purposes, but also those from all plants showing curling of the lower leaves and, at all events in the south, those in immediate proximity to diseased plants.

Potato Scab. Common potato scab or brown scab is one of the most widespread diseases affecting the potato. It is particularly prevalent on light gravelly soils poor in humus, and on other soils where ashes, lime, and other alkaline substances have been used freely. The disease is also caused by a minute fungus which attacks the surfaces of the tubers and gives rise to the production of dark scattered scabs, or large eroded patches. The scabs increase in size with the growth of the tubers, and they may in bad cases cover almost the



How to grow Potatoes. 1. Planting on the flat: a, well-dug bottom soil; b, pulverized top soil. 2. Planting in ridges. 3 and 4. Good and bad planting: a, bad; b, its results; c, equally bad; d, good, and its results. 5. Why earthing is necessary: a, exposed tubers greening. 6. Earthing up in stages. 7. Very early potatoes in frames: a, fine soil; b, soil and leafy mould; c, hotbed of leaves and manure



Potato. Row dug up, showing number of tubers produced
(Courtesy of "Amateur Gardening")

entire surface of them. For eating, the sound part of a scabbed tuber is not injured.

The most important preventive, according to Leaflet 5 of the Ministry of Agriculture, is suitable treatment of the soil. To sandy or gravelly soil organic matter of a vegetable nature should be applied. In gardens and small holdings, decayed leaves, spent hops, and grass mowings can be dug in from time to time to enrich the soil in this way.

The application of lime, ashes, and soot should be temporarily suspended on alkaline soils, and alkalinity of the latter counteracted by the use of superphosphate of lime and sulphate of ammonia in spring.

Black scab (q.v.) or wart disease, a serious trouble, attacks certain varieties of potato. Where it is prevalent, immune varieties should be grown. If it is suspected, notify the Ministry of Agriculture.

Sclerotinia and Sprain. Potatoes are subject to other diseases, although these are neither so widespread nor so frequent as those already mentioned. The *sclerotinia* disease is most destructive in the northern and damper parts of this country, and is especially virulent in the west of Ireland. To eradicate it, the most important step is promptly and systematically to collect and burn all diseased portions of the plant, to prevent the disease from spreading. The sterilisation of the soil by steam is also recommended. Unless this has been done, potatoes and other plants liable to *sclerotinia* should not be grown in soil which has been infected by this disease until at least three clear years have passed.

The disease known as sprain is not generally distributed, but it is troublesome in some localities where the soil conditions appear to favour its development. It can be recognized by the dark brown blotches or streaks on the flesh of the tubers. The disease known as pink rot is common in parts of Ireland, especially in the west, and has also appeared in Great Britain. The fungus causes a wet rot of the tubers, and the disease owes its

name to the fact that the cut surfaces of infected tubers turn pink when exposed to the air. It commences when the potatoes are still in the ground.

Colorado Beetle. This pest (see illus. below) of potato plants can be very destructive. Its occurrence should at once be notified to the local police or, in England and Wales, to the Ministry of Agriculture, 28, Milton Road, Hatpenden, Herts., in Scotland, to the Department of Agriculture for Scotland, St. Andrew's House, Edinburgh. The Colorado Beetle Order of 1933 requires occupiers of land to report any suspected outbreak. It also prohibits the keeping of any live Colorado beetles, and the spraying or other treatment of any of the crops concerned, except under the authority of the ministry.

Cooking Potatoes. The potato is almost entirely a starchy food. It contains useful salts, but these are mostly lost unless it is cooked in its jacket. To support life it must be combined with fats, gravy, for example, improving its food value; and proteins, meat, fish, milk or cheese. New potatoes are less starchy than old ones.

To boil potatoes in their skins, wash and scrub the required number, and put them into a pan containing enough boiling water to cover them adding a dessert spoonful of salt to every quart. Bring them to the boil, then simmer them gently until they are soft but not broken. Drain off the water, peel the potatoes, then put them back into the pan, covering them with a clean cloth and placing the lid so that it half covers the top. Put the pan over gentle heat for a few minutes, shake it occasionally, then turn out the potatoes into a hot vegetable dish. If preferred, the potatoes can be served in their skins, water being drained off and the potatoes left to dry thoroughly in the covered pan. The time required for cooking is 20 to 30 min.

To boil potatoes without the skins, they are washed and peeled thinly, the eyes and any damaged or discoloured portions being removed. Potatoes of large size are cut into halves or quarters of uniform proportions. They are then put into a pan of salted boiling water, and cooked in the same way as potatoes boiled in their skins. Some varieties of potato cook better if placed in cold water, so should results not be successful by the method given, try this. Potatoes need careful watching to

prevent them from boiling into the water. Some do this quicker than others, therefore it is impossible to give a definite time for cooking.

Steamed potatoes cooked in their skins should first be washed, then placed in a covered steamer over a saucepan of boiling water. Cook them until the skins begin to crack, and the potatoes themselves feel soft when tested with a fork; then take the lid off the steamer, move the pan to the side of the heat, and let its contents dry. Peeled potatoes can be steamed in the same way. This method of cooking takes about $\frac{1}{2}$ hour.

Potatoes baked or roasted with a joint should first be parboiled, drained, and sprinkled with salt. Lay them in the pan under the meat, basting them frequently, and when they are brown on one side turn them and brown the other. They can be served on the dish with the joint, or placed in a hot vegetable dish. These require about 1 hour's cooking.

For baking in an oven, old potatoes should be scrubbed, and placed in moderate heat. If the oven is too hot, the potatoes will be burned. They are baked sufficiently if they crunch when squeezed in a cloth.

New potatoes after being washed and scraped, are put into a pan of boiling salted water with a sprig of mint, and simmered gently until they are tender. The water is poured off, the pan returned to gentle heat, the top half covered with the lid, and the potatoes left to dry. A small piece of margarine is placed in a hot vegetable dish, and the potatoes served in it, with the mint removed, and a little chopped parsley sprinkled on top. 20-30 min. is the time required.

Fried Potatoes. Fried or chip potatoes are served with grilled chops and steaks, fish, etc. Old potatoes are better for this than new ones. The starch cells in new potatoes are undeveloped, so they do not fry a good brown. They can be used, but they must not be overcooked in an effort to get them as brown as old ones. Slice some washed and peeled potatoes into finger-shaped pieces, with a knife or potato cutter, or cut them into straws, cubes, or thin oval-shaped slices. Put them into a bowl of cold water until they are required, and in the meantime heat some fat in a saucepan until a faint blue smoke rises from it. Drain the potatoes in a clean cloth, and put them into a frying basket, placing the latter in the fat. Shake the basket occasionally so that the potatoes cook on both sides, and when they are brown and crisp lift out the basket, let the fat drain from it into the pan, then empty them into a dish lined with crushed tissue paper. Stand the dish in a warm place until the potatoes are drained thoroughly, then serve in a hot vegetable dish with salt sprinkled over them.

Fried potatoes that can be eaten hot or cold, known as potato crisps, are prepared by



Colorado Potato-Beetles. The beetles are $\frac{1}{4}$ -in. long, with black and yellow stripes running from head to tail. The grubs, bright pink or red, feed voraciously on the potato foliage, along with the parent beetles. See centre column
Crown copyright

shing the potatoes as finely as possible with the special cutter illustrated in this page or with a very sharp knife. Put the pieces in cold water and let them stand as long as possible. Heat a pan of deep fat until it is past the blue smoke stage; it must be perfectly still and no sign of smoke arising. Dry the potatoes well, and put them into a fine-meshed frying basket. Reduce the heat under the frying fat, and lower the basket in carefully. The fat will bubble up in the pan, and must be withdrawn from the heat if it shows signs of boiling over. Allow the potatoes to cook for about two minutes, until they are transparent looking but not browned at all.

Then take them up, and let them drain in the basket in a warm place while the fat is reheated to the same degree as before. Then put in the basket of potatoes again. They will become crisp and brown almost immediately, and must then be taken up and drained well on tissue paper. Sprinkle with salt and serve, or if required cold they should be stored in an airtight package. The two fringes take every scrap of moisture from the potato slices, so they remain crisp indefinitely.

Other Methods. For saute potatoes, cold boiled potatoes are required. Cut 1 lb. of these into slices $\frac{1}{4}$ in. thick and fry them in a pan containing 1 oz. smoking hot fat. When they are pale brown on one side turn them over and cook them on the other. Serve them hot, sprinkled with salt and finely chopped parsley.

Boiled potatoes may also be served en gratin. To do this, cut larger cooked potatoes into slices, place these in layers in a fireproof dish with a little grated cheese and salt and pepper sprinkled between each layer. About 3 oz. cheese will be required for this. Pour a put white sauce over the whole, sprinkle a little more cheese on top, and heat the mixture in a moderate oven or under a grill. Serve the potatoes in the dish in which they were cooked.

Potatoes that are to be mashed should first be boiled or steamed, and then put through a sieve, beaten up with a fork, or pounded with a potato masher. The potatoes are placed in this and are forced through a wire mesh by pressing down a handle. Add $\frac{1}{2}$ oz. butter or margarine and a tablespoonful of milk to each lb. of potatoes, season to taste, and then put them into a hot vegetable dish. Mark the top with a fork and then place the dish under a grill or in the oven so that the potatoes may become lightly browned on top.

For potatoes à la Duchesse, melt 2 oz. margarine in a saucepan, and when hot add 2 oz. grated cheese, and the yolk of one egg. Mix all well together over gentle heat, and season to taste with salt and pepper and a dust of nutmeg. Turn out on to a floured board and spread out until $\frac{1}{4}$ in. thick. If the mixture seems too soft, add a little flour. Cut out into rounds with a pastry cutter, or make into 3-in. squares. Mark the tops in a lattice pattern, with the back of a knife. Brush over with beaten egg, put the pieces on a greased baking sheet, and bake in a moderate oven until a delicate brown. The same mixture can be shaped into potato balls, egged and breadcrumbed, and fried in deep smoking fat.

Potato scallops are also made with this mixture put into buttered scallop shells, the tops sprinkled with grated cheese, and baked in a hot oven till slightly brown.

Cold cooked potatoes can be used to make potato fritters. Melt a piece of margarine a little less than twice the size of a hen's egg in a saucepan, stir in $\frac{1}{2}$ lb. cooked potatoes rubbed through a sieve, the yolks of 1 or 2 eggs, a dust of nutmeg, and seasoning to taste. Mix in also 2 stiffly whisked whites of egg, and in the meantime boil a deep panful of fat. Drop the mixture a teaspoonful at a time, and cook the fritters golden brown. Drain them, and serve garnished with parsley.

Potato Cake. Cold boiled potatoes can be used to make these cakes. Prepare them by rubbing 2 oz. margarine into $\frac{1}{2}$ lb. flour, adding 2 oz. castor sugar, $\frac{1}{2}$ lb. mashed cold potatoes, and 2 oz. sultanas, and mixing the whole with a beaten egg. Roll the mixture out to a thickness of about $\frac{1}{4}$ in., cut it into round cakes, and bake these in a hot oven for about 20 min. When they are cooked, slice them through the middle, butter them and

on a floured baking sheet to prove. Bake them in a hot oven. They should be eaten hot after being pulled apart with two forks and buttered.

POTATO CUTTER. There are various kinds of potato cutter on the market, one of them being a cylinder-shaped tin with a perforated top. The potato is forced through these holes with the hand and comes out in long finger-shaped pieces. This cutter is



serve them hot. If sweet potato cakes are not liked, the sultanas and castor sugar can be omitted.

Potato Croustade. Savoury croustades can be made from 2 lb. cooked potatoes, 1 egg and 3 extra yolks, some breadcrumbs and seasoning. Rub the potatoes through a sieve, then mix them with the 3 yolks and salt and pepper to taste, and shape the mixture into flat round cakes, about $\frac{1}{2}$ in. high and the same in diameter.

Brush these over carefully with beaten egg and coat them with fine breadcrumbs; repeat the operation, and then with a small cutter mark a small circle in the centre of each cake. Fry the croustades in hot fat, drain them on kitchen paper, and with a sharp pointed knife take out the centre pieces. Scoop out as much as possible of the potato without damaging the sides and fill the hollow with minced poultry, game, or fish, seasoned and mixed with thick sauce.

Potato Dumpling. Potato dumplings for serving in soup can be made in the following way: Boil 6 dry mealy potatoes in their skins and, after removing the latter, rub them through a fine sieve. Beat 1 oz. butter to a cream, add to it the yolks of 2 or 3 eggs, and then mix in the sieved potato, $\frac{1}{2}$ oz. flour, and seasoning to taste. When the mixture is firm, divide it into small, even-sized pieces, shape these into dumplings and cook them for about 5 min. in a pan of boiling stock.

Potato Rolls. Steam two good sized potatoes, and while still hot pass them through a wire sieve into a basin and mix with them $\frac{1}{2}$ lb. sifted fine flour and 1 teaspoonful salt. Cream $\frac{1}{2}$ oz. yeast with sugar and add to it 2 $\frac{1}{2}$ gills of warm water. Make a well in the centre of the flour and potatoes and pour in the yeast and water. Sprinkle a little flour from the sides over the top, cover it over with a thick cloth, and set it to rise in a warm place.

When it is quite light, knead in 2 oz. margarine, and the well-beaten yolks of 2 eggs, and work up into a dough as for bread (q.v.), adding with the eggs $\frac{1}{2}$ teaspoonful carbonate of soda dissolved in 1 tablespoonful warm water. Divide the dough into equal parts, and make each into long-shaped rolls. Place these



Potato Cutter which cuts fancy shapes, mainly for purposes of garnishing. Above, left, device for slicing potatoes finely and quickly for potato crisps.

specially designed for chip making. The cutter illustrated on the left is used for slicing potatoes finely for crisps. The other is for cutting fancy shapes.

POTATO PEELER. There are various kinds of patent potato peelers, differing both in size and design. The most effective type consists of a straight piece of wood about 4 in. long, into which is fitted a convex-shaped projection of cast iron. The latter, in turn, is fitted with a blade which reaches just below the edge of the iron.

The blade is drawn sharply over the potato, with the result that the peel is drawn upward and outward through a slit in the iron. This peeler can also be used for peeling other vegetables as well as fruits. Its chief recommendations are that it can be used without danger of cutting the hands and it peels the skin off without waste.

POTATO RING. In silver and Sheffield plate the potato ring is now chiefly a curiosity valued by collectors. It was first made in Ireland early in the 18th century, and Irish specimens fetch high prices. The rings were used as stands for the wooden bowls in which the potatoes were brought to the table.

The conventional shape is a band of metal about 2 $\frac{1}{2}$ in. deep, bent to form a circle, something like a large napkin ring. This was swaged to present a concave surface, and was decorated by piercing or embossing, sometimes by chasing or engraving. Most rings were larger on one side than on the other, the reason being that they could be used for bowls of different sizes.

Potato rings are occasionally found fitted with glass bowls. Several beautiful examples are in existence. One in Sheffield plate is ornamented with foliage, and has flat chasing with open mounts round base and rim. See Sheffield Plate; Silver.

POTENTIAL DIVIDER: In Wireless. This is a tapped resistance, which, when connected across a source of potential, enables voltages to be obtained which are a known fraction of the total voltage across the ends of the resistance. Thus a potential divider joined across a 6-volt battery might have tapplings at one third, one half and two thirds of the total resistance. The voltages between each tapping and the negative end of the resistance would be four, three and two volts respectively.

Potential dividers are widely used in mains driven radio receivers for adjusting the voltages for the different valves. This is particularly the case in sets designed for operation on direct current supplies. The device is wound on heat-resisting material, and there must be a free circulation of air round it so that heat can be readily dissipated.

In practice there should not be more than a slight "warmness" from the component itself, so long as it is wound with a generous gauge of wire. Nevertheless, this heat will be supplemented by that from the valves and, therefore, ventilation by means of apertures in the back or base of the set is usually provided.

These should be left free, e.g., not impeded by standing the set flat against a wall. However, that a set should feel warm when touched, especially after it has been in operation, is quite normal.

Potentiometers, or potential dividers having continuously variable tapplings, are used in wireless receivers for controlling volume.

Volume control potentiometers, when incorporated on the low frequency side of a set, should have a value of not less than 500,000 ohms, and may take the place of the grid leak in a resistance capacity coupled stage or be connected across the secondary winding of a low frequency transformer.

POTENTILLA. The cinquefoil or potentilla is an old hardy herbaceous perennial of which there are several improved varieties with large showy flowers. The plants reach a height of 18-36 in. and bear single or semi-double strawberry-like flowers in summer. They can be increased by division in autumn or by sowing seeds out of doors in May. The varieties Gibson's Scarlet, Yellow Queen and William Rollinson, red and orange yellow, are a few of the best. *Potentilla nitida* is a beautiful little rock garden plant with grey leaves and pink flowers; it needs gritty soil and should be protected by a raised piece of glass in winter.

POTHERB. This name is used for any plant the leaves and stalk of which are used for food, more especially for such herbs as thyme, marjoram, etc., used for flavouring. Vegetables that are served in stews, such as carrots, turnips, parsnips, onions, etc., are often known as potherbs. See Asparagus; Balm; Basil; Cabbage; Spinach, etc.

POTLID. Owners of picture potlids, which were sold in such large numbers between 1848 and 1859, and are now valuable, often complain of there being no really satisfactory method of displaying them. The pictures require no covering of glass, being upon earthenware, glazed, and absolutely permanent. The illustrations show the system of framing.

To make the rim, it should be turned about 1 in. in width all round, and of an inside measurement about $\frac{1}{2}$ in. less than the potlid in diameter. The front may be moulded, but the outside circular edge and the back are kept flat. No rebate to take the lid, as an ordinary frame takes glass, is necessary, but one may be turned out of the back if desired. Any convenient wood may be used, one of the hardwoods being desirable;

that illustrated is from walnut, 1 in. thick. The rim is shown in section at A.

The backing consists of a ring of common wood—soft white deal is suitable. The ring is turned of an outside diameter like that of the frame ring, or, if preferred, a trifle smaller, but in any case, not larger, than the frame. The inner circular aperture in the backing ring is of a size to fit tightly over the outside rim of the potlid. This backing ring is shown at B.

The potlid, C, is adjusted in the frame, A, the convex or picture side of the lid being outward, and thus visible through the frame. The ring, B, is then slipped over the rim at the back, and the ring screwed, with not less than 2 and not more than 3 screws, to the frame. One screw is shown at D. The potlid is thus held most securely in the circular frame, and both the front with its picture, and the inner portion of the lid with perhaps its maker's marks, are visible as desired. A picture ring, E, permits of the framed lid being exhibited upon a wall. The best plan is to arrange them along the top of a set of shelves or an oak dresser.

POT POURRI. There are various recipes for making pot pourri from mixtures of sweet scented flowers, herbs and leaves preserved with salt and spices. It is necessary to gather the flowers or leaves to be used on a dry day as any dampness on them causes mould. The stalks should be removed and the flowers, etc., dried for at least two days in the sun. The old-fashioned roses with strong perfume are the best to use.

A simple recipe is made from rose petals and a powder composed of equal quantities of musk, storax, cloves, iris root, Jamaica pepper and dried lemon peel. A layer of rose leaves is put into the jar, then bay salt and next a layer of the pounded and powdered spices. Repeat these layers till the jar is full. Cover closely and leave for a month. After that the contents may be mixed and stirred and placed in ornamental jars or muslin bags. Jars are better for preserving the scent of pot pourri. They should be provided with well fitting lids, which may be removed to allow the fragrance to escape into the room as required.

Another recipe requires a handful each of lavender flowers, rose petals, sweet birch leaves, jasmine, rosemary and half a handful each of sweet geranium leaves, eucalyptus, thyme and lemon verbena. Put layers of these in a wide-mouthed glass jar with bay or rock salt between each layer. Cover for a month and

after turning out the mixture add 1 oz. powdered iris root, a few drops each oil of neroli, oil of musk, oil of cloves and oil of cinnamon. The bay salt which is obtainable in lumps is roughly pounded. It may be mixed with an equal quantity of common salt.

POTTED FISH. Almost every kind of fish can be potted, but those usually preserved in this way are salmon, shrimp, and lobster. They can be bought in small glass jars or tins, but can also be prepared at home according to the following directions.

Potted salmon is best made from cold boiled fish. Remove all skin and bone from the latter, and pound it well in a mortar with enough margarine or butter to make a smooth paste. Add seasoning to taste, then turn the mixture into clean, dry pans, and cover it with melted butter before tying it down.

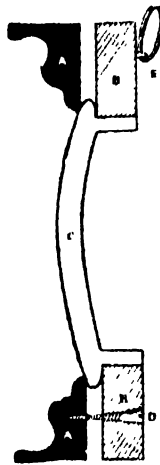
To make potted shrimp, remove the heads and tails from a pint of shrimps, and then pound the latter in a mortar with a little butter or margarine. The shells also should be pounded with butter, and then pressed through a fine hair sieve before they are added to the fish. Season to taste.

Melt a lump of butter about the size of a hen's egg in a pan, and stir the shrimp mixture into it. When the butter has been absorbed, move the pan to the side of the heat and add a little powdered mace. Let the mixture cool before potting it as described in the previous recipe. Prawns can be potted in the same way, and so can the remains of any cooked white fish. The latter, however, should be flavoured with anchovy and well seasoned.

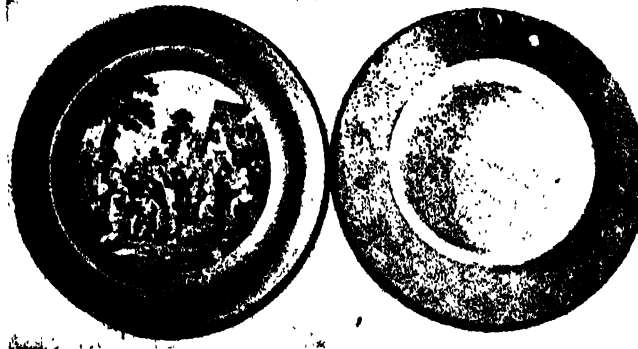
POTTED MEAT. Almost any cold cooked meat can be potted. First free the meat from skin and gristle, then mince it finely and put it into a mortar with seasoning to taste. To every $\frac{1}{2}$ lb. meat allow a little more than 3 oz. melted butter or margarine, adding it gradually and reserving a little to cover the meat when it is potted. A little tomato sauce or Worcester sauce added to cold mutton or beef is an improvement. Pound the mixture well, then rub it through a wire sieve, and put it into pots, pouring the remainder of the butter over it to keep out the air. Ham makes a good addition to most fresh meats.

Potted chicken is especially tasty when mixed with ham or tongue. To prepare it, take $\frac{1}{2}$ lb. cooked chicken and $\frac{1}{2}$ lb. cooked ham or tongue, mince these thoroughly by putting them through a machine 2 or 3 times, and then pound them in a mortar with a little more than 3 oz. butter or margarine, previously melted. Season the mixture to taste, rub it through a fine wire sieve, and then put it into small glass pots, putting a little more melted butter on the top of each.

Raw meat can also be potted, but should be as lean as possible. Bake 1 lb. of this in a jar to which is added a tablespoonful of butter, the same quantity of water, a few cloves, a pinch of allspice, and some salt and pepper. Cover the jar well with greased paper and a close fitting lid, and place it in a tin of boiling water in the oven, or in a saucepan of boiling water on the stove. Cook the whole gently for 2 or 3 hours, then take the meat out of the jar and make into a paste by pounding it in a mortar. Finally, rub it through a sieve, and put it into jars covered with clarified fat.



Potlid. Sectional view of framing



Potlid. Front and back view of the lid with frame completed

POTTERY AND POTTERY COLLECTING

How to Recognize Typical Pieces of Many Periods

This contribution is concerned with decorative earthenware pieces, and the reader is especially referred to the article on China. Other branches of ceramics are dealt with under faience; Terra Cotta; Tiles. See also the separate entries on kinds of Pottery, e.g. Satsuma Ware; Wedgwood; Whieldon Ware

Although the term pottery is sometimes used in a general way for all pieces of the potter's art, including china, porcelain, earthenware, faience and stoneware, certain authorities make the distinction between china and pottery that the former ware is manufactured from the finer clay fabrics, while the latter includes the pieces made from the coarser kinds. This distinction has been accepted for the purposes of this Encyclopedia.

As far as English pottery is concerned existing pieces range from the 14th century, but very few which authentically belong to a date earlier than the 18th and 19th centuries are to be found in ordinary collections. The 18th-century English earthenware was, however, of great beauty, interest and diversity, and single pieces are still to be picked up at reasonable prices. Owing to the immense output of pottery of all types it is best to confine a small collection if not to one particular kind, at least to one class, country or period.

Early Pottery. The most valuable pieces of pottery, however, are not the English wares, but those made by the ancient Egyptians, Greeks, Romans, Chinese and Persians. In the main these are beyond the means of the ordinary collector, although specimens are found in the great public and private collections. The Egyptians were highly skilled potters, and passed on their art to the Greeks. Roman pottery showed refined taste in glazing and decoration. The most interesting Chinese periods for pottery are the Tang (618-906) and Sung (960-1279) dynasties. The glazes of

of the pieces. The Persians extended their art into the island of Rhodes, and early Rhodian ware followed very closely the inspiration of Persian ceramics, being fabricated of a sandy, highly vitrified clay covered with a hard glossy paste and decorated with floral, bird and animal designs. Other sources from which the potter's art was introduced into Europe were by the Moors in Spain. Fig. 2 illustrates an example of Valencian ware dating from about 1470, which shows the Moorish influence.

Apart from Majolica and other faience ware, Palissy ware made in France by the French potter of that name was one of the most important steps towards perfecting the potter's art in Europe during the 16th century. An example of Palissy ware is illustrated in Fig. 3.

English 18th-Century Pottery. English earthenware of the 18th century rivals in interest and importance that of later times, including as it does the supreme achievements of the prince of English potters, Josiah Wedgwood. He and his contemporaries, Turner, Adams, Palmer, and others produced work of which scattered examples may still be met with. Modern reproductions are made at Etruria and in the Adams works at Tunstall from the old formulas and models. That epoch-making age was preceded by the hard Staffordshire salt-glaze which, for a century after 1690, was the glory of native ceramic art. A typical example is illustrated in Fig. 4. In the earlier part of the 18th century, before English porcelain was yet in being, there were produced the Ebers red teapots, the variegated ware of Astbury and Whieldon, the Fulham stoneware of John Dwight, and the delft, which was wrought at Lambeth, Bristol and Liverpool. Astbury ware also included pottery statuettes: an example of which dated 1740, is shown in Fig. 5.

For about eighty years of the 18th century the Frank family were producing pottery of a refined delft type at Bristol. This earthenware had a clear greenish-blue glaze, and many of the designs were transferred by printing. Some of the pieces had grounds of blue or purple dots surrounding a printed or painted panel. Characteristic also of Bristol ware was white ornament over the enamel glaze. The initials of the painter, sometimes the word Bristol, the date or occasionally two strokes crossed diagonally with two others were marks

used on Bristol 18th-century ware. While Chinese, Persian and Indian styles of decoration were copied in the Staffordshire potteries, several firms specialised in views of cathedrals, castles and country houses. These were mostly on dishes and plates; figures also received much attention from the designers.

In cottage homes, apart from lustrated ware, the taste for chimney-piece ornaments was catered for by the Staffordshire factories with the so-called china toys. These earthenware figures were in part based upon the Chelton tradition, in part upon the unskilled work of local modellers. Their figures were artless, but they carried on the 18th-century work of the Wood family. Fig. 6 illustrates a statuette of a girl modelled by Ralph Wood about 1760.

The productions of John Walton, nearly all in enamel colours, such as his shepherdesses with a foliage background, and his scriptural groups, mark a degeneration of type which ultimately led to the spotted dogs and woolly sheep of Ralph Salt. The figures of these and a score of other potters, who turned out farmyard incidents and portraits of celebrities, are to be found, genuine or forged, on many a farmhouse mantel. Most of this class of image work is unmarked and indeed a marked piece should be suspected. With these may be ranked the jugs and mugs portraying historical events, with other memorial ware.

Lustrated ware includes Egyptian basalt (matt black), glossy black, white ware which is blue printed, and lustre printed pottery.

Like the willow pattern at Caughley, lustre ware was introduced, at Spode's, in the later years of the 18th century. The large output of Newcastle and Sunderland lustre ware of a less interesting and artistic character covered with scenes, rhymes and texts in black transfer work and enlivened by patches of pink or purple lustre fell within the earlier years of the 19th century. When the design itself was lustrated the effect was less crude, but this north country ware at its best seldom



Pottery. Fig. 1. Rare Persian example of Ray pottery dating from the 12th century. Farish-Watson Collection, New York

the pieces are rich and are sometimes dark brown or palish green. White Tang wares have a crackled glaze and a creamy glaze. Specimens of Sung ware show incised designs under a green celadon glaze.

The Chinese have been acknowledged the world's masters in ceramic technique, certain of their periods and styles produced articles that have probably never been excelled for beauty of workmanship. Persian pottery was influenced to some extent by the Chinese. Fig. 1 shows a Persian example of Ray pottery dating from the 12th century. In the 13th century the royal city of Rhages was the producing centre of Persian pottery, and beautiful lustre painting was revived to decorate many

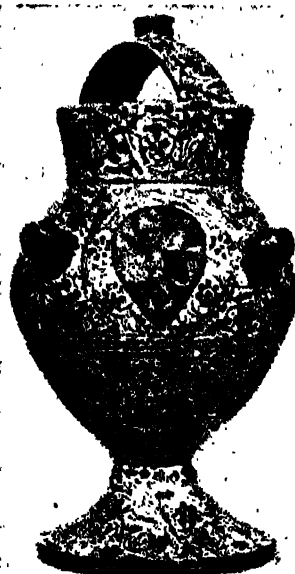
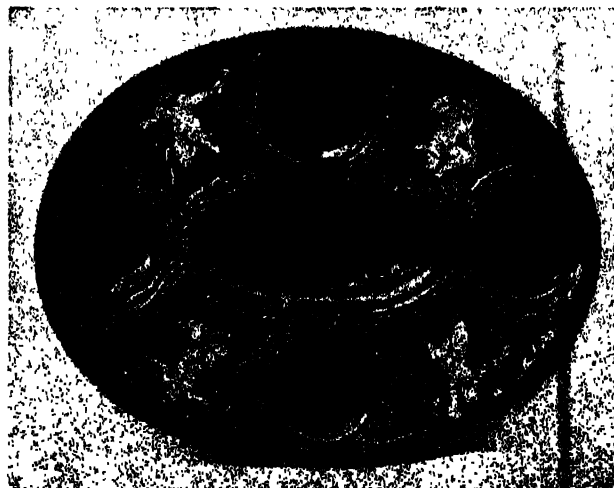


Fig. 2. specimen of Valencian ware, a vessel with shield of arms and bryony scrolls, c. 1470. British Museum



Pottery. Fig. 3. Example of Palissy Ware, a 16th-century dish with cupids set between the sunk portions. British Museum



Pottery. Fig. 4. Quaint salt glaze group, dating from about 1730
British Museum

reached the level of that made in Leeds, Swansea and Staffordshire. As it was mostly unmarked, its origin is usually determined on the dubious evidence of the potting.

Some of the best Staffordshire lustre was made by Wedgwood's, whose founder himself did some good work in this method. After 1831, a silver lustre made with platinum was introduced at Longton by Charles Allerton, and for 40 years his products attained such distinction that they were in constant demand by collectors. In contradistinction to the Sunderland lustred mugs are the salt-glazed brown wares produced at Brumpton and Chesterfield, inaccurately called Nottingham ware. This includes complimentary tankards, jugs with hunting scenes, and animal figures for the mantelpiece.

Victorian Pottery. With the Great Exhibition of 1851 there was inaugurated a revival, which profoundly influenced the pottery crafts. Many of these pieces have an old-fashioned rather than an antique air. Victorian pottery should be chosen for its decorative merit, whether it seeks to simulate ancient styles or is the outcome of the creative thought of its own age.

The task of emulating the gleaming hues of the medieval majolica was approached in the mid-century at Minton's, and afterwards at Wedgwood's. The two methods of reproduction were quite distinctive, the former using dark clays with opaque enamels, the latter white bodies with coloured glazes. Later on the accomplished work of William de Morgan, who successfully rivalled the glories of the old Gubbio as well as the Persian lustre, remains quite unsurpassed.

A profound influence has been exerted upon the ceramic industry by the faience and other art fabrics for which the Doulton works at Lambeth are famed. Dating from the Great Exhibition, they present distinct qualities of make and design, and as moulds are but sparingly if ever used each piece possesses its own individuality. Even when the work is deliberately reminiscent of early pottery, as in the case of Miss Crawley's studies in the old Persian and Rhodian manner, the same observation applies.

Another great development of this period was the invention of Parian ware (q.v.), whose ivory-white body, unglazed or slightly glazed, enabled statuettes to be moulded which

resembled marble. Besides Copeland's, Minton's, and Wedgwood's, there are other works, such as Bootes in Burdlem and the Irish factory at Belleek, which did admirable Parian figures. A polychrome effect was also secured by majolica pigments at Stoke, especially by Poole, Stanway and Wood. The smaller examples are often desirable and, like other Victorian products, will assuredly attract in due time the attention of collectors. The larger figures and groups are often of poor design and pretentious.

Demanding at their best no less care in modelling, are the terra cotta figures and groups of the same period. Notable among these are the classical statuettes turned out at the This was founded by a potter of another name in 1790, and a mark embodying this date was adopted late in the 19th century. It is one of several instances of a mark with an early date actually attesting not the antiquity but the modernity of the ware.

Modern Pottery. Much rustic pottery is turned out to-day in Sussex, Devonshire and other districts. Some of it is made of common brick clays with blended glazes, others have a fire-clay body. Specimens of the best work of the Ashted Pottery are most desirable acquisitions. Their table ware is excellent in shape and design. In the productions of the Wedgwood, Minton, Copeland, Caudon and other Staffordshire potteries, besides the Doulton in London, there is great variety. Individuality is a vital characteristic and the pottery of to-day has attained a standard of popularity on its own merits. In some of the designs there is a note of the bizarre in brilliant colour and geometrical forms. In others rich soft tones are finely blended, as in the modern versions of pebble ware (q.v.) and of "Peach bloom." White ware is perhaps the most beautiful, and two examples of fine design and glaze are illustrated in Figs. 7 and 8.



Modern Pottery. Fig. 7. Duck and drake in highly glazed white ware, characterized by beautiful modelling. Fig. 8. Statuette of Victorian lovers

This white ware is sometimes faintly tinged with colour where the pottery shows through the paste surface. Very beautiful book ends are modelled in it, while candlesticks made of white Poole pottery show fine designs. A lovely branched pair for the mantelpiece or for the dining table have a conventionalised bunch of grapes on each stand. Book-ends in creamy crackle, which serves to imitate the appearance of the pottery, show geometrical designs, and are a change from the animal and cherub figures so often seen. Other decorative book ends are made in polychrome pottery, in a great variety of shapes, designs and colours.

The modern vases shown in Figs. 9 and 10 rely on shape for their simple beauty and for



Fig. 5. Grenadier in Astbury ware, c. 1740. Fig. 6. Statuette of a girl, modelled by Ralph Wood, c. 1760

their usefulness, as they are both entirely charming and adequate for flower arrangement. Fig. 9 is in brown earthenware of the classical amphora shape, while Fig. 10 is of rose pink lustre shading to deep wine red. Ashted and Poole pottery vases showing multi-coloured designs on white grounds provide many examples of decorative modern English ware, while French pottery is well represented by pieces which have excellent designs of sporting character, the development of sport having greatly increased of late years in France. Modern designs, whether





Pottery. Fig. 9. Brown earthenware amphora, a graceful and useful pottery vase for tall flowers or foliage. Fig. 10. Example of modern lustre ware shading from rose pink to wine red.

English or French, are characterized by suggestion—the amount which is left out being as important as that which is detailed. There are most certainly outstanding potters to day whose collected work will increase in value.

porcelains, the most famous are those of Satsuma. The tawdry platters and vases which are turned out mechanically in Japanese factories for the purposes of export trade should be avoided.

POTTERY: MAKING SIMPLE PIECES

An Outline of a Pleasing and Useful Handicraft

This contribution explains how simple articles can be modelled, fired and glazed, at home, and concludes with a brief description of methods for decorating pottery.

There are two methods of forming the shapes in pottery: one is by building up the clay by hand on a potter's wheel, the other by casting and pressing. Apart from the potter's wheel and a muffle furnace the tools are simple and inexpensive. The clay used for making bricks or flower pots can be used if properly sieved and evaporated down, but for good work it is advisable to employ common C.C., or cane-coloured earthenware. China clay forms the main body of porcelain, blue clay, known also as ball clay and black clay, is very strong and plastic. Flint, which has been calcined and ground, and bone ash are mixed with clay to bind the material together and render it translucent.

How to Mix the Clay. Ordinary clay can be refined by mixing it with water to form a thin cream, passing it through a No. 40 sieve. The mixture is placed in a shallow pan and slowly evaporated. The dried clay is mixed with fine sand and powdered flint—8 parts of clay, 2 of flint, and 1 of sand. This body, although not so safe in use as the properly prepared C.C. body is quite suitable for such objects as candlesticks, small trays, or thick bowls for bulbs, but it would not do for circular forms on the wheel, or for casting.

The clay being hard at first is moistened with water; the lumps should be reduced to powder by pounding, water being then added until the clay is soft enough. It is of the right consistency when the fingers easily make an impression in it without picking any of it up. It can be kept in this condition for a long time if placed in a tin or zinc-lined box, small quantities will remain plastic if kept in a tin biscuit box and covered with a damp cloth.

Holiday makers often bring home as souvenirs of continental travel individual pieces of local pottery which have attracted their attention. Favourite objects of this kind are imitations of Cologne stoneware tankards, Dutch delft—often not delft at all in the sense of being tin-enamelled—Italian majolica, and Spanish lustre. The homely wares of North Africa with their brilliant and strikingly oriental designs are gay in certain rooms. Modern Italian pottery also is much favoured on account of its wealth of colour and pleasing shapes.

The most popular rival of British pottery that is procurable without foreign travel comes from Japan. Of its earthenware fabrics, not to be confused with the true

previously imprisoned in the clay. It will be necessary to repeat this operation at least a dozen times before the clay is ready for use. Improperly worked clay is sure to break in the kiln, so it is important that every trace of air should be removed.

Simple Modelling. The first stages in modelling are illustrated in making a simple tray as in Fig. 4. A lump of clay should be taken from the box, a piece a little larger than an orange being sufficient. Place it on a board and work it into a brick shape with the hand. Next roll it out flat with a rolling pin to a thickness of about $\frac{1}{4}$ in. Break the piece up and work it into a brick shape again, then roll it to about $\frac{1}{4}$ in. thick. Repeat the process, finally leaving a flat piece about $\frac{3}{8}$ in. thick. Then cut the edges off to form a square of 4 in. or so.

The next step is to mark off lines $\frac{1}{2}$ in. from the edges, using the sharp edge of the modelling tool lightly. The edges of the clay are gradually bent upward, working with the finger and thumb and shaping the corners round one finger. The surface of the clay should be finished smooth, and the work placed on one side to dry. A similar tray can form a base for a candlestick, the standard being made on the wheel if possible, although it may be square in section.

Good practice for the wheel will be found in shaping small circular trays or bowls as shown in section in Figs. 5 and 6. The method of working, called throwing, is to place a ball of clay on the centre of the wheel, which should then be revolved from right to left. Finger and thumb are used to press the clay down to the revolving board, and when sufficiently flattened out the edge should be raised. To form a bowl shape, as in Fig. 6, start with a well-worked ball of clay, wet the thumbs and work the lump of clay into a mound. The clay is worked into a cone shape to indicate the centre, and then the thumbs, pressing downward, will throw out the material sideways. By pressure here and there any required shape can be formed, but considerable practice is necessary before a shape of even form and thickness is produced. The candlestick shown in Fig. 7 is a suitable shape for a piece of wheel-made pottery; the section in Fig. 8 indicates the proportions of the various parts.

Duplication of Pieces. Casting and pressing is the method to be followed if several objects of the same shape are required, or if it is desired to make a duplicate of an existing piece of pottery. The vase form in Fig. 9



Pottery. Useful articles which can be modelled in clay, and fired and glazed at home. The photograph shows, amongst other pieces, a candlestick, an ash tray, and a vase ornamented with a conventional flower pattern.

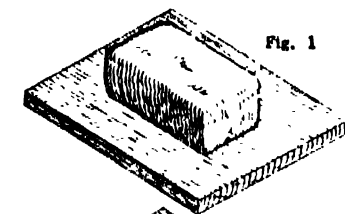


Fig. 1

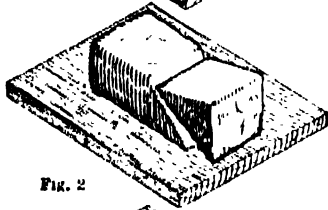


Fig. 2

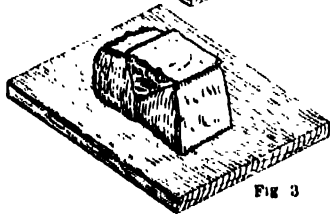


Fig. 3

is suitable for the wheel and equally so for casting in a 3-piece mould, if the top were not curved inward, the shape could be cast in a 1-piece mould. Taking a small bowl as a pattern for a 1-piece mould, prepare some plaster by sprinkling plaster of Paris from the hands rapidly into a basin half full of water until the surface is reached. Pour off the surplus water, and stir very carefully to avoid bubbles, and then use. The bowl should be lengthened with clay and placed upside down in a circular cardboard box or a clay made receptacle. Pour the plaster over the bowl, and when set remove the bowl with a twisting motion. If it sticks, wet the plaster and try again. A 1-piece mould can only be used for forms that can be removed in this way.

A large number of shapes can be cast in a 3-piece mould, but they must not have sharp contrasts in form. To make one, first set out on the pattern a line that will divide it into 2 equal parts. Place it on the board and build up a bed of clay to the halfway line, extending $\frac{1}{4}$ in. at the top and $\frac{1}{4}$ in. at the bottom. Shape the sides of the clay and attach a border of cardboard, as in Fig. 10; then fill up the space with plaster, allowing at least $\frac{1}{4}$ in. of plaster above the pattern. When set, carefully remove the walls and the clay and work out semi-circular depressions at each corner of the half mould, as shown in Fig. 11. These recesses, which should be quite smooth, are necessary in order that the two halves of the mould may be accurately keyed together.

Coat the surface of the plaster with olive oil, replace the walls, the half mould being at the bottom, as in Fig. 11, and fill up with plaster again. When set, the walls should be removed. Then smooth the bottom of the mould and cut the recesses in each half at right angles to the join, as shown in Fig. 12. Oil this surface, place walls round the mould and fill up with plaster to give a thickness of about $\frac{1}{4}$ in., thus casting the third member or bottom piece of the mould. When set, the two halves of the mould should be prized apart, the pattern removed and the mould placed together again to dry, the final drying taking place with the parts separated.

Casting a Vase. The method of casting allows considerably thinner pottery to be made. First prepare a large bowl or small pail, which should be perfectly clean. Place a few lumps of clay in it, and pour water in to more than cover the clay. Next squeeze the clay between the fingers, and thoroughly mix the clay with the water until it forms a creamy

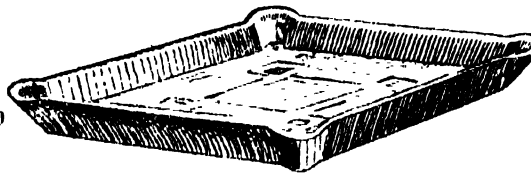


Fig. 4

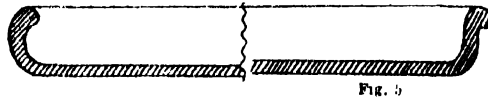


Fig. 5

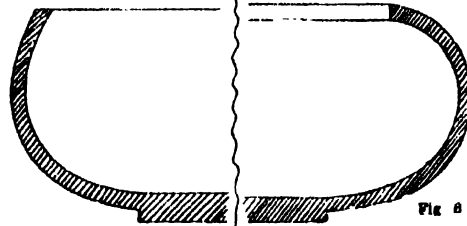


Fig. 6

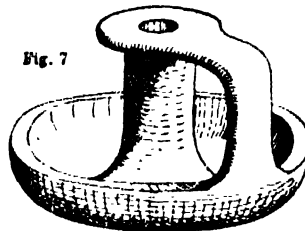


Fig. 7

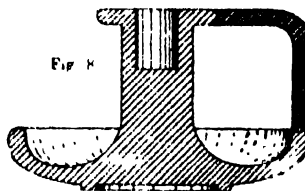


Fig. 8



Fig. 9

liquid. The liquid, termed "slip," is passed through a No. 40 phosphor-bronze sieve, a stiff bristle brush being used to assist it. The mould is sponged lightly with water and tied together with string, one or two wooden wedges being used to tighten up the parts, as in Fig. 13.

The mould is now tilted, and the slip should be very carefully poured into it so that no bubbles are formed, as these mean holes on the surface of the finished casting. The liquid or slip should be watched, and it will be seen that the level gradually falls. Keep refilling it and give the mould a revolving movement from time to time to prevent the clay settling at the bottom. As the sides absorb the water from the slip, the clay becomes deposited on

the mould, and when sufficiently thick, the slip should be poured out and the mould left in a warm place for about $\frac{1}{2}$ hour. The mould should now be taken apart, using every possible care; there should be no difficulty in removing the vase as the clay shrinks on drying. The lines and the waste at the top should be trimmed off with a sharp knife, then leave the shape to become quite hard.

To complete the work, rub the base on glass paper to level it, rub the sides down with fine glass paper, round off the edges at the top, and finish by wiping over the whole of the shape with a damp sponge. Throughout these finishing operations the clay shape must be handled very carefully, as it is very fragile, and will continue to be until it is fired. The 1-piece mould is done in the same way but as only those objects that can slide out of the mould, after the casting has set, are suitable all that is necessary to take the casting from the mould is to place it upside down. The same methods of cleaning up apply.

Pressed Shapes. These are easier but it is not so easy to make the ware thin. Proceed by flattening a lump of clay, using if desired a batter as in Fig. 14, thus being a thick disk of

plaster with a stout handle. The clay is placed on a piece of linen or calico and pressed out flat with a rolling pin to a thickness of $\frac{1}{4}$ in. or so. Sponge the surface of the mould, place the thin slab of clay on it, and press carefully to the shape.

When both sides of the mould have been done in this way, smooth the edges, coat the joins with slip, place a thin layer of clay along the join, and then place the parts together. The joins are pressed to the sides of the mould from

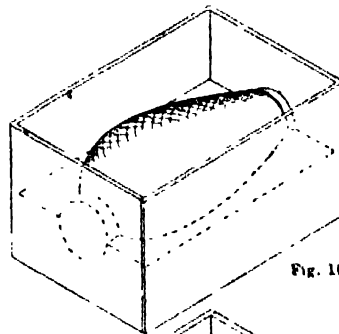


Fig. 10

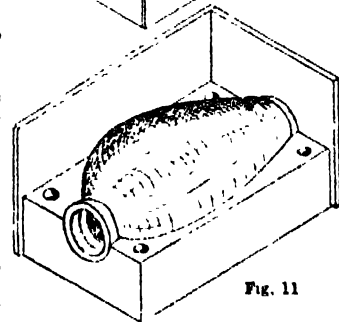


Fig. 11

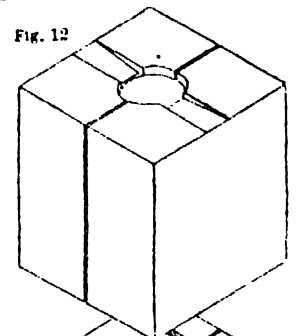


Fig. 12

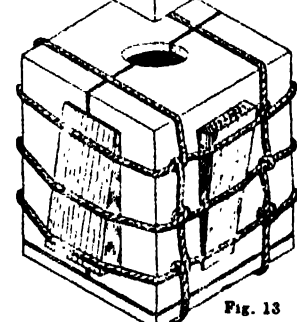


Fig. 13

Pottery-Making. Fig. 1. Preliminary working of clay into a brick shape. Fig. 2. Wedge cut from corner with a piece of string. Fig. 3. Wedge placed in centre and driven in. Fig. 4. Easily made tray. Figs. 5 and 6. Small curved trays and bowls in section. Fig. 7. Candlestick suitable for a piece of wheel-made pottery. Fig. 8. Section showing proportion of parts. Fig. 9. Form for a vase which can be cast in a 3-piece mould. Figs. 10 and 11. How to cast the vase. Fig. 12. Recesses cut in each mould at right angles to the join. Fig. 13. Mould tied together with string tightened with wedges.

the inside and wiped over with a damp sponge fitted to the end of a piece of stick. If the mould is placed in a warm room for an hour the shape inside will have shrunk sufficiently for the mould to be taken apart, when it can be treated like a casting.

Much pottery can be made without moulds by building the shape or throwing on the wheel, but in making spouts and handles, either pressing or casting should be followed. Any additions can be made to a piece of pottery while in the clay stage by scratching the parts to be joined coating them with slip, and holding in position until set. Handles or projections applied in this way should not be touched before firing and must be carefully fixed, or they will come apart. When making pottery, it must not be allowed to dry out, and if the piece cannot be finished at one sitting it must be kept covered with moistened cloths.

There are many ways of decorating pottery. Line incision is the earliest and the easiest, it is done with a modelling tool, and for small work there is considerable opportunity for artistic treatment. Another method suitable for the pre-fired stage is to use slip formed from different coloured clays—a number of

We illustrate a special gas muffle furnace for pottery. It is made in a number of sizes, but the amateur potter will need a muffle size of at least 14 in. wide, 8 in. high, and 18 in. deep, if vases and similar objects are to be fired. A still larger muffle has a height of 14 in., the other dimensions being as last mentioned. A furnace of either type needs a 1½ in. gas service. A furnace for joining pottery should be installed and fixed strictly in accordance with the instructions issued by the manufacturer.

Colouring and Glazing

The biscuit ware is now ready for glazing or underglaze painting. The glaze is obtainable in various colours, and may be applied with a diffuser or a brush. A glaze firing at about 800° C. will be found most convenient, and if the article is to hold water it will be necessary to glaze the interior as well. Colours can be added to a plain glaze by mixing them with boiling water, passing through a 200 sieve, and mixing with the glaze; only a small amount of colour is required. Before the underglaze paint is applied, the surface of the pot must be stopped by coating it with a solution composed of gum arabic and water. The paints employed for the work are metallic oxides or oxy-salts, and give their true colours when combined with the glaze.

Shapes that are not quite perfect need not generally be thrown away, for small defects on the biscuit pottery can be removed with glass paper and small holes, cracks or chips in the article can

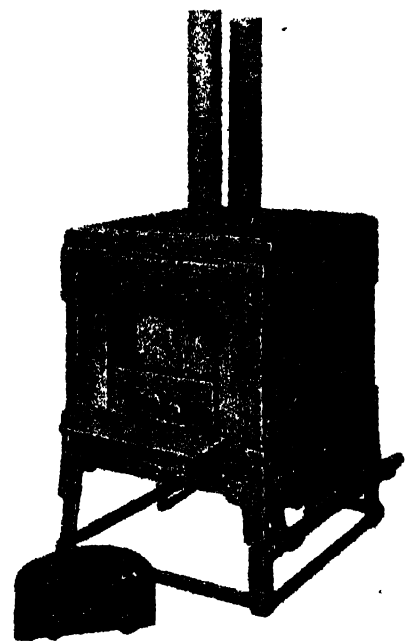
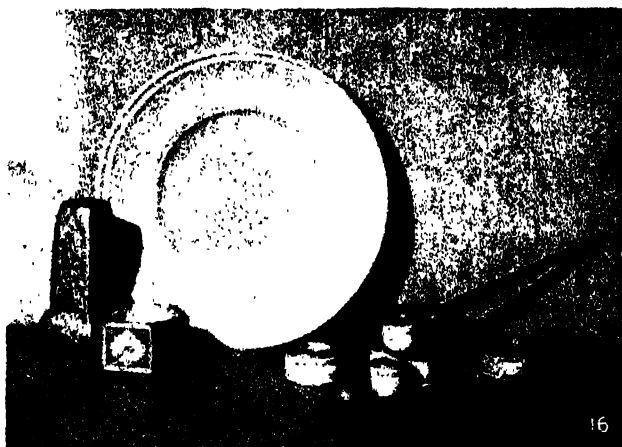


Fig. 15. Muffle furnace for firing pottery
Fletcher, Russell & Co., Ltd., Warrington

A simple outfit of these contains 6 enamels, gold and silver powder, medium, varnish, 1 flat brush and 4 camel hair brushes. The design is incised on the plastic surface of the pottery with a modelling tool before the clay is fired. Fig. 17 shows the pleasing and simple type of design which lends itself admirably to this kind of decoration. Pieces of pottery can be painted in sets to harmonize with any colour scheme. This style of decoration is particularly suited to pottery book-ends of simple or geometrical shapes. For those who are unable to make their own pieces, a variety of articles can be obtained with designs already incised. The procedure is very simple. First coat the whole of the article with the special varnish, which dries in about half an hour. Then a coat of gold or silver enamel is applied, taking care that this flows into the incised lines of the design, this, again, is allowed to dry for about an hour and the decoration



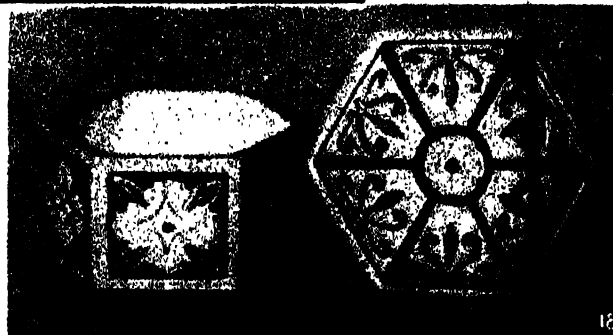
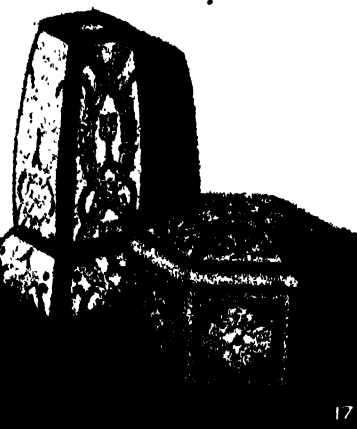
pleasing effects can be worked in this way by applying the slip with suitable brushes.

Firing the Clay. Before pottery can be glazed or painted it is necessary to subject it to great heat and to transform it into what is known as biscuit. This is the most critical part of the work. If a small furnace is used, the work must be placed in a muffle, supported on slabs of fireclay or sand. The shapes are conveniently arranged, the air inlet almost closed and the dampers open. Light up gradually if using a gas muffle furnace, close the lower door, and after the muffle has got sufficiently hot—in about half hour—the lower door should be pushed in close and the interstices covered over with clay.

When the work has finished steaming turn on more gas, leave for about an hour, plaster up the top door and give full heat until the interior, judged from the spy hole, is white hot; this will take about an hour. The work can now be allowed to cool. To make quite sure, the placing of suitable trial pieces so that they can be removed during firing will help; if the trial piece can be scratched on the surface it is a proof that the firing is not complete. Small pieces of clay, known as Seger cones, can be placed inside, these will bend over when the correct temperature is reached. Common C.C. requires a temperature of 1,100° C. and about four hours in the furnace.

be filled up with a cement made of 3 parts fired clay, 1 part damp clay, and ½ part of No 8 flux ground to a powder, sieved, and mixed with gum. Biscuit pottery can be coloured without firing by applying colour diluted with gum arabic, dextrine, and water to the moist surface of the clay. A fine surface can be applied to unglazed pottery by using ordinary wax polish.

Cloisonné Decoration. Another method is to apply cloisonné enamels.



Pottery Making. Fig. 16. Painting on unglazed pottery with cloisonné enamels after the design has been incised, as shown on the plate. The vase has been gilded but not coloured, while the jar is half completed. Fig. 17. The finished pieces. Fig. 18. Jar with lid decorated in colour

in colours is proceeded with. Fig 16 shows articles in three stages of decoration. The plate is merely incised with the design the vase has been guided, and the small jar has been half coloured. The design is picked out in various tints, using a separate fine brush for each tint employed on the piece. Figs 17 and 18 show the pieces finished.

Care should be taken not to let the colours run into the incised lines, or the effect will be spoilt. There is no need for subsequent varnishing, as the enamels are durable and have a brilliant finish. They can be thinned if desired with a special thinning medium.

The larger brush used for the varnish should be cleaned with methylated spirit, while the brushes for the gold, silver and coloured enamels should be cleaned with turpentine.

POTTING: In the Garden. Success in the potting of plants is acquired only by practice and experience, ignorance of its elementary principles is the cause of nine-tenths of the sickly anaemic-looking plants seen in many greenhouses and in rooms. For successful potting attention must be paid to the cleanliness of the crocks and pots, the drainage, the ingredients for composts and correct planting.

Pots and crocks should be well soaked and cleansed with water, even if quite new. Proper drainage is essential. Take a fairly large piece of curved crock, and place this, hollow side downward, over the pot hole. Incidentally, an oyster shell is admirable for the purpose. The next layer of crocks must be determined by the class of plant being potted. If this is a hard-wooded subject, crocks should be broken up quite small, but if the plant is softwooded, as, for example, the geranium, then larger pieces will be required.

The larger the pots the larger the crocks, allowing deeper drainage to plants remaining in pots for a considerable time, and less to those having a shorter stay. Indeed, for forcing stuff, such as spireas, one large curved crock is often sufficient. On top of the drainage place a little rough of leaves, moss, or fibre, to prevent loose compost dropping amongst the crocks and choking drainage.

The chief ingredient in potting composts is loam with plenty of fibre, such as is obtained from old pastures, where the roots of grass are several inches deep. Cut turves in autumn, stacking them grass downward and placing light facings of well-rotted manure and a sprinkling of lime between layers. In twelve months this will become a stack of loam in suitable condition to form a base for most potting composts.

Other indispensable materials for the potting shed are leaf-soil, peat, silver sand, charcoal, wood ashes, mortar rubble, and bonemeal. These are not all required at one time; but with supplies to draw upon, practically any combination for many different kinds of plants may be made up at will. Whatever combination is in preparation, this should be well mixed and turned with the spade, damping it when necessary, until a gripped handful will hang together, yet separate at slight touch.

A good general compost is formed of 3 parts loam, 2 parts leaf-soil, and 1 part sand. For seeds and cuttings only use equal parts of loam, leaf-soil, and sand, finely sieved and mixed.

The placing of the plant is no less important than the contents of its pot. Do not drag, or lift by the stem, any young plant from its early receptacle, but spread it upside down upon the fingers of one hand and gently rap the rim of the pot on the potting bench, so that the pot itself may be lifted clear. Carefully remove any old crocks with as little root disturbance as possible.

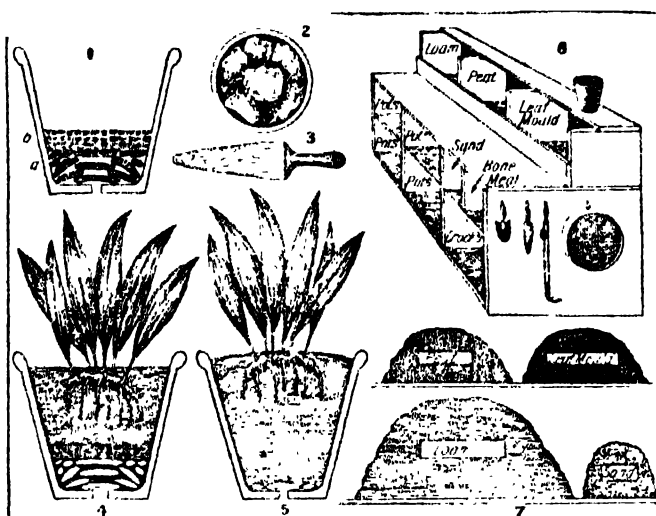
A few inches of soil, made firm with a potting stick, should be placed in the larger pot, and the new plant arranged upright in its centre. Suitable compost should be worked round and

rammed firm, but not hard, until the pot is filled within $\frac{1}{2}$ in. of its rim, a necessary space for watering. When ramming, be careful not to touch the old ball of soil, but only the filling of new compost. Various plants and bulbs require potting at different depths.

A potting bench or table is desirable for the amateur gardener, the construction of which may be on the lines suggested in the sketch. Labels, too, should not be ignored if choice plants are to be duly identified. A potting stick is easily constructed from an old broom handle, rounded at one end and cut chisel-shaped at the other. Different sizes of pots should be stocked and boxes of graded crocks kept ready to hand. A mistake is to use pots that are too large. A safe rule is to take a size which allows 1 in. between its sides and the old root ball. See *Aspidistra*, *Chrysanthemum*, *Flower Pot*, *Hydrangea*, *Palm*.

Pottle. A pottle, originally a little pot, has come to mean a measure of liquid, one consisting of 4 pints.

Pott's Disease. See *Curvature*; *Tuberculosis*.



Potting. 1. How to crock: a, potshears; b, chopped turf or rough soil. 2. Crocks seen from above. 3. Potting stick. 4. Example of good potting. 5. Bad method of potting. 6. Design of a useful potting bench. 7. Diagram showing proportions of various ingredients which are necessary to make an ideal compost.

POTT'S FRACTURE. Fracture of the fibula, the smaller bone of the leg, about 3 in. from its lower end, is called Pott's fracture. It is produced by twisting the foot outward, as for example, in slipping off the kerb or into a hole in the ground.

The slighter cases may be mistaken by the patient for a sprain of the ankle. It is therefore desirable to consult a doctor when a sprain is at all severe. First-aid treatment consists in the application of well-padded splints from the knee to below the ankle.

POUFFE OTTOMANS OR HUMPTIES

Materials and Methods for Making Attractive Floor Cushions

The reader of this article should turn for further information to the entries on Box Ottomans; Cushion; Leather Work; Patchwork; Upholstery.

A pouffe or humpty is the name given to a variety of floor cushions varying considerably in size and shape, from small circular pouffes to large square or oblong box humpties which possess well sprung and upholstered lids.

Pouffes are suitable for use in small rooms as they take up little floor space, and when not required as seats they can be placed out of the way in a corner or under a table. The box type is a useful addition to bedroom or sitting room, as it can be used either as a slipper, hat or work box. The softer type of solid pouffe floor cushion is a cosy accessory for the nursery, while invalids and elderly people find them more comfortable than the old-fashioned footstool.

Solid Pouffes. The solid pouffe is the simplest and to make. It can either be circular or square in shape, and is made by stuffing a calico cover with some suitable filling. Decide approximately the size required, then cut out a pattern in strong paper. This can be pinned up, and gives a good idea of what the size will be when the floor cushion is completed: 16 in. diameter each for top and bottom, as in Fig. 1, makes a medium-sized circular one with a band of 16 in. deep between, as in Fig. 2. It is important to get a true circle, or the finished shape will not be good. A circular tray can be used; or if this is not available, take a piece of fine string, tie a small loop in one end, and fasten the other end to the centre of the piece of paper with a drawing-pin. Place a pencil in the loop, stretch it tautly, moving it in a circle; the length of the string gives the radius, or half the diameter.

To make the case, cut a strip of unbleached calico, preferably selvedge way, equal in

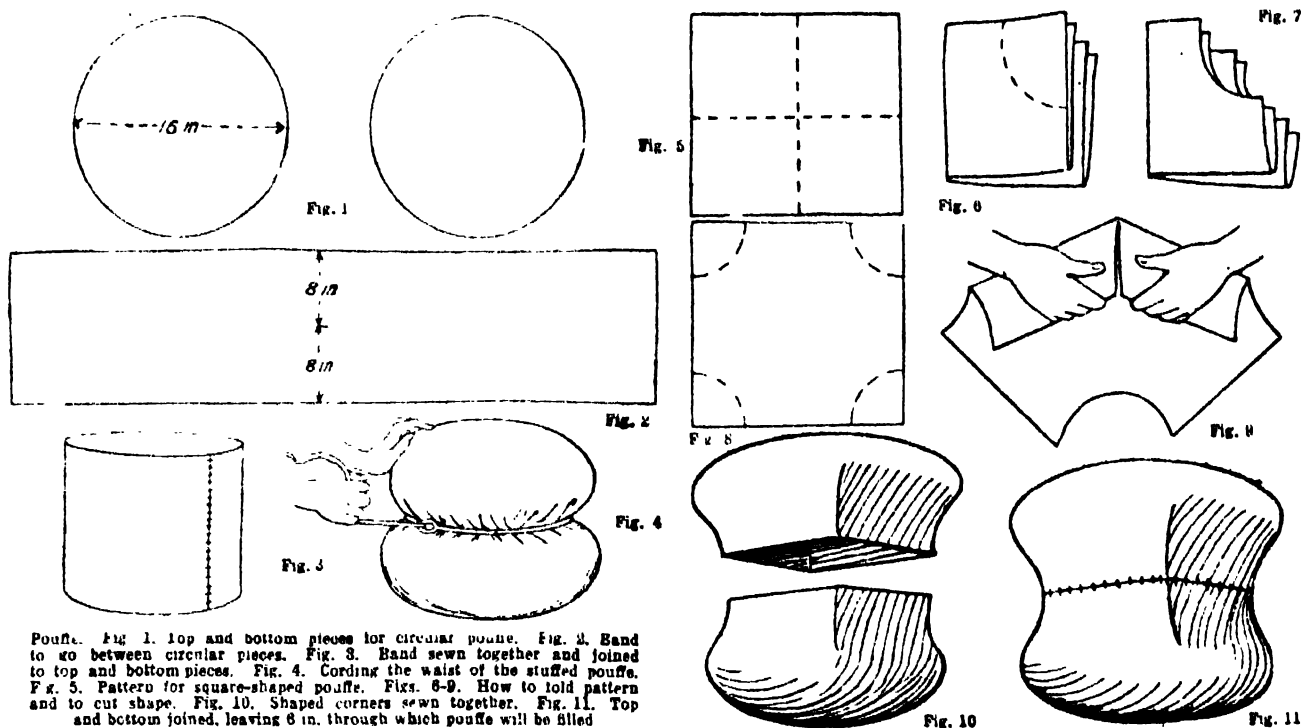
length to the circumference of the circle, and allowing $\frac{1}{2}$ in. for turnings. Tack the top of the band to one circle and the bottom of the band to the other circle; the case then resembles a short bolster, as in Fig. 3. Machine on the wrong side, leaving about 6 in. open on one side.

As a quantity of filling material is required when making large floor cushions, the centre can be filled with cuttings of woollen or cotton materials. For the new filling necessary, kapok, imitation hair, ture, flock, and brown rugging wool, with wood wool right in the centre, are all suitable. For a medium-size pouffe about 10 lb. of wool is necessary.

As the filling is a dusty process, it should be done in a room with little furniture, and preferably in one with a linoleum floor covering. Each handful of filling should be fluffed out before it is put into the case. Use a wooden spoon or stick for forcing the wool into the edges. When as much as possible has been forced into the case, take a piece of flat wool and beat it evenly all over.

Unless the cushion is well stuffed, after it has been in use a short time it becomes flat and loses its shape. When it is impossible to add any more wool, the seam can be sewn up securely. Take some strong string and, using a slip-knot, cord the waist as tightly as possible, Fig. 4. Place a piece of flat wadding out to size over the top of the case before covering with the upholstery fabric.

For a pattern of a square-shape pouffe cut two pieces of paper about 30 in. by 30 in., as in Fig. 5, for a medium-sized pouffe. Fold each piece in half lengthways, and then width ways—this gives a small square of 4 thicknesses, as in Fig. 6; curve off the top left-hand



Pouffe. Fig. 1. Top and bottom pieces for circular pouffe. Fig. 2. Band to go between circular pieces. Fig. 3. Band sewn together and joined to top and bottom pieces. Fig. 4. Cording the waist of the stuffed pouffe. Fig. 5. Pattern for square-shaped pouffe. Figs. 6-9. How to fold pattern and to cut shape. Fig. 10. Shaped corners sewn together. Fig. 11. Top and bottom joined, leaving 6 in. through which pouffe will be filled

corner (Fig. 7) and the shape will resemble Fig. 8. These two pieces form the top and bottom of the pouffe.

Having cut out the unbleached calico for the case, sew the curves at each corner together as in Fig. 9, and when all the curves are joined the cap-shaped pieces are formed which make the top and bottom of the pouffe. Place one above the other and join them together, leaving one of the four seams open for filling (Figs. 10 and 11).

There are two ways of making the outer covering for pouffes: either by making the material into a bag-shaped case, leaving one side open into which the cushion is dropped, or by stretching the material and sewing it securely along each waist line. The former is less trouble, but the latter allows the covering material to be stretched more tightly. Place the waist edge, with a 1 in. turn, along one side of the waist, and stitch securely with strong thread. Then pull the fabric tightly round the cushion, stitch it firmly along the opposite waist-line, again along the first side, and attach the material to the two remaining sides of the waist, cutting off any surplus. Gather the corners of the material to form ears, and neaten the waist with cord to match the cover; if the cord is thick the ears can be secured by being slipped through the twisted cord. A pouffe of the above description is illustrated in Fig. 12.

Attractive round pouffe floor cushions can be made by using velvet for the sides and bottom and introducing patchwork of leather and velvet for the top. Such a pouffe can be finished without the corded waist if made 20 in. in diameter, the outer covering being cut in the shapes shown in Figs. 1-3, and the top and bottom finished with a piping or fancy cord. The side strip (Fig. 2) may be cut 10 in. deep (less turnings). Fancy striped material may be used for the top and bottom of such pouffes with a plain fabric for the sides; or terry cloth with an appliqué design in a contrasting colour will make a good cover for a nursery floor cushion.

A two colour scheme may be devised for a square floor cushion by mounting a square piece of brocade or damask cornerwise on upholstery satin which matches the ground-work of the figured material, and finishing off the edges with narrow gold braid or coloured gimp.

Pouffe Ottoman. The pouffe ottoman, shown in Fig. 13, makes an attractive piece of furniture, as well as a convenient receptacle for music, needlework, or newspapers. A strong wooden box should be procured, if possible with dovetailed sides. No lid is necessary. A box 18 in. long, 12 in. wide, and 12 in. deep is a convenient size; one of smaller dimensions, when upholstered, would not have a very roomy interior. Divide the

box in two pieces, cutting off a section 4 in. deep, but if the box is too shallow to allow of this, a narrow box having the same length and width can be utilized by knocking out the bottom, or a wooden frame can be made by using four 4 in. battens; this should be strengthened at the corners. The bottom part of the box will form the container or ottoman and the 4 in. frame, when fitted with springs, will make the lid and seat of the pouffe.

The two parts must be upholstered separately, the fixing of the hinges being the last step. First upholster the bottom part, if necessary, scrub and dry the box, preferably out of doors. When dry, rub the inside first with coarse and then fine glass paper. Cover the sides with any suitable fabric, such as easement cloth or hessian. Measure the distance round the box and the depth; allow 2 in. for turnings. Tack the hessian firmly along the top edge and the bottom, keeping it as taut as possible. The reason for covering the wooden sides is that it is impossible to fix hair or wool filling on to wood.

Stitch 3 or 4 rows of strong twine loops into the hessian, using a sacking needle and leaving about 2 in. between each row. Each loop should measure about 2½ in., and a back stitch is necessary between the loops, otherwise the filling, when forced under, causes them to slip. Fig. 14 shows the lower part of the box covered with hessian, and the rows of twine loops ready for the stuffing.

Wood wool is a good first stuffing, and rugging wool, fibre, imitation hair, and kapok, are all suitable for the top layer. Arrange the stuffing as evenly as possible under the string loops, giving the corners extra padding, so that when finished they will be well rounded, as in Fig. 13. Cut off a length of unbleached calico, allowing for the padding and for mitred corners, and tack it in position along the bottom of the box; standing over it, pull the cover up tightly over the padded sides, as in Fig. 15, rearranging and adding more stuffing if needed. Tack the cover just inside the box. Line the inside first with layers of



Pouffe. Fig. 12. Solid pouffe upholstered in small patterned brocade. Fig. 13. Pouffe ottoman, which can be made from a wooden box, with sprung and upholstered top

cotton wool and then with easement cloth. A straight piece of material about 2 in. deeper than the sides of the box and long enough to go round it is necessary. Use small brass tacks to fix the lining along the inside of the top edge. Cut a piece of stiff cardboard to fit the bottom of the inside tightly; cover it with the same material, and place it in position. A piece of plain American cloth to match the upholstery fabric in colours should be tacked over the bottom of the box that comes next to the floor, to prevent the edges of the material fraying and to neaten. The bottom of the pouffe should be fitted with castors or glides. If the latter are used, 4 small stained blocks of wood should be screwed in position at each corner, in which the prongs of the glides should be fixed; this raises the pouffe off the ground and improves its general appearance.

To upholster the lid, first stretch the frame with good quality webbing bands length ways as in Fig. 13, and then interlace them at right angles in basket fashion. A webbing strainer or small piece of wood used as shown enables the bands to be stretched very tightly. Procure five or six 8 in. copper springs, arrange them in position on the webbing, and stitch them firmly, using twine and a packing needle. When all the springs are fixed at the bottom, tack the outside ones tightly to the frame, and tie each one to the adjacent springs. When all are lashed down, cover the springs and sides of the frame with hessian, make twine loops and pad in exactly the same way as the lower part. Extra padding must be piled on to the top of the springs or the seat will become flat after being in use a short time. Keep the stuffing in position with a cover of unbleached calico, tacked to the lower edge of the frame.

Tapestry, rep, velvet or plush may be used to cover the humpy; with a patterned material a more professional appearance is given if an oblong panel 10 in. by 14 in. is pinned on to a length of fabric. The panel must be arranged so that it comes in the centre of the lid, and the piping should be of one of the colours incorporated in the pattern. Mitre the corners neatly, making any surplus material into small rosettes. Make a small tab of covering material about 2 in. long, and tack it to the middle of the front edge of lid, to facilitate opening. Line the inside of the lid with easement cloth over cotton wool, tacking it on to the wooden rim. Attach the bottom of the pouffe to the lid by two small brass hinges. Two chains screwed inside to the sides of the box and to the rim of the lid may be added to keep the lid from falling back.

POULTICE: How to Make. As a means of applying moist heat to any part of the body one may make use of a poultice. Poultices increase the flow of blood to the part which they cover, withdrawing it from deeper, congested areas; hence they are useful in deep-seated pain, as in chest affections, inflammatory pain in the abdomen, or in the painful swelling of joints. In the case of boils, poultices relieve the tension and bring the boils to a head more quickly. The materials used are crushed linseed, bread, oatmeal, starch, etc. Crushed linseed is



Pouffe. FIG. 14. Lower part of ottoman covered with hessian, also four rows of string loops and some of the wool in position. The last piece of webbing is being strained and tacked on the lid. FIG. 15. Springs placed on webbing of lid.

better than linseed meal, because it contains more oil, and therefore does not so readily stick to the skin. Mustard and various antiseptics can be combined in the poultice. Bread, linseed and mustard poultices are described under their own headings, while directions for making one of starch are given in the article on Eczema.

Poultices large enough to cover both the back and chest of the patient are sometimes

ordered. For children, these can usually be made in one piece, the poultice being wrapped right round the body and secured with safety pins; but for adults it is generally necessary to make two separate poultices, large enough to meet at the sides. These cannot be pinned satisfactory and are therefore held in place with a special binder or a wide strip of material that will serve the same purpose. A warm, close-fitting jacket, such as that sometimes worn by pneumonia patients, is also useful for continuing these poultices.

Linseed and other poultices, to be effective, must be smooth, soft, and as moist as possible, without being sloppy. They should be thick enough to retain heat and moisture for some time, but not so thick as to be uncomfortably heavy. As their value lies principally in the warmth they supply, it is necessary to make them in quickly, and to apply them at once before they have time to cool. For this reason everything that is required should be got ready before commencing to make the poultice, and the patient should also be prepared. Poultices on any part should be removed before they become cold. The skin should then be dried with a soft cloth, smeared with vaseline, and covered with a piece of flannel. See Bread Poultice; Eczema, Fomentation; Linseed; Mustard, etc.

POULTRY AND POULTRY HOUSES

How to Rear the Birds Successfully in Town and Country

The poultry keeper will find further practical information under the headings: Chickens, Incubator. The Cockerel and those on the various breeds, e.g., Leghorns, Bantams, may also be consulted. See Column 11 of this page.

Accommodation and feeding are two main items for consideration by the newcomer to poultry keeping. Birds must have ample space, for sleeping and exercise. Feeding stuffs, being rationed, may be a problem unless plenty of household scraps are available. These difficulties overcome, one could start by buying pullets, up to six months.

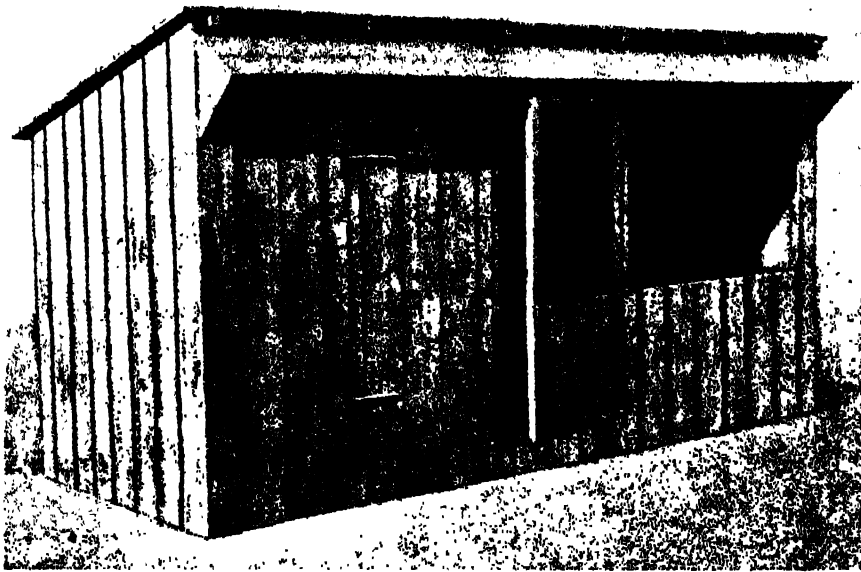
These young pullets can be kept until they have completed their first season of laying, and then sold to a dealer, or be fattened and killed for the table, or be kept for another season of laying. It pays to buy what is known as guaranteed stock, that is, bird-bred from stock which has been trap-nested, and whose egg production is therefore accurately known. Many poultry farmers are breeding cross-bred birds, known as sex-linked, that is, the union of two pure breeds which have progeny of such colour and marking that the sexes are dissimilar as soon as the chicks are hatched. This method of breeding reduces the breeder's costs, as he is saved the expense of rearing his cockerels.

The Poultry House. For suburban or town poultry keeping, a house with a covered run is best. The space given in the house to each bird should be three to four square feet, and

the run should be about from 20 to 24 feet long and as wide as the house. If the house can be placed on grass the larger portion of the run should be open, and the house and run should be moved from one spot to another each year. If grass is not possible, the run should be well brushed and scraped each week, also dug over about once a month, and given a good covering of lime.

The floor of all poultry houses should be boarded and covered with peat moss or chaff. Such a floor is more sanitary and there is less trouble from rats and mice. As soon as the litter on the floor shows signs of becoming damp, or there is a musty smell, it should be swept out and a fresh lot put in. The perches should be fixed from 18 in. to 2 ft. from the floor so as to avoid injury to the legs and feet when the birds fly down from the perches, and so as to miss the draughts which are a frequent cause of colds when the perches are fixed too high.

If the houses are kept clean, the perches and their holders brushed over with paraffin or turpentine every fortnight (except in the height of summer), when once a week is to be preferred, there will be little trouble from red mites, or lice. The best aspect for a house



Poultry House. Fig. 1. Combination house and scratching shed, which will accommodate six or eight birds.
Courtesy of Boulton & Paul, Ltd

is south-east. The birds then get the early morning sun, and avoid its heat during the latter part of the day in the summer months.

The manufacture of poultry houses has now become a great business, and the poultry appliance builders can supply any sized house that may be required from one suitable for 5 or 6 birds to one for several hundred. Strongly built, well lighted, efficiently ventilated, yet draught proof, are the points of a good serviceable house. The ready made houses are sent out in sections and are quickly and easily bolted together. They are fitted with all the necessary locks and bolts, and windows.

Three common types of poultry house are illustrated. Fig. 1 shows a combination house and scratching shed for six or eight birds. The simplest type of house consists of four walls of timber covered with a timber or felt roof and possibly provided with a boarded floor. Half of the front is usually devoted to a door, of which the one part may be boarded up or the upper part can be made with wire netting. The other half of the front may take the form of a window covered with wire netting and provided with some kind of adjustable screen or shutter, as shown in Fig. 2.

A development of the same type of building is illustrated in Fig. 3, and comprises a small

house with a span roof. The building is mounted on strong cast iron wheels. In addition, perches, dropping board, and outside nest boxes are provided, and so arranged that the birds can enter them from within and the attendant can remove the eggs from the exterior. This type of house is suitable for birds that are kept on open range, as the building can be moved about from one place to another and the birds enabled to run on fresh pasture.

Larger and more pretentious buildings used for roosting and scratching sheds are often used. By another method, an extension of the main building consisting of a long run with a back and side wall and open front is enclosed with wire netting, and is used for scratching purposes, the main building being reserved for roosting and laying. One portion may be utilized for breeding and incubation purposes. Another plan is to use the main building for egg production and to have separate buildings for incubators, rearing, and the storage of foodstuffs. Provision should be made for keeping the grain and other foodstuffs in a dry location and free from attack by rats and sparrows.

For the benefit of the poultry keeper who wishes to build his houses and runs we give at the end of this article constructional details of two or three useful types.

Feeding the Birds. In feeding a small flock the table scraps mixed with equal parts of bran and middlings will give them good feeding, in fact all they need, except for grain and green food. The latter may be the refuse of the vegetables used in the house, such as the outer leaves of lettuce, cabbage and broccoli, the tops of carrots, parsnips, beetroot, and turnips. The rinds of vegetable marrows and melons may be boiled and mixed with the household scraps. The grain feed, wheat and oats, should be given at night, a good big handful for each hen. It is advisable that the

house scraps and meal mash should be given warm in the early morning.

By way of a change barley meal, or Sussex ground oats, may be used occasionally instead of the middlings. Fresh clean water should be provided every morning, and in the summer time at midday as well. Flint grit and oyster shell is also needed. If the run is not very large the birds may be exercised by hanging the green food in a net bag and suspending it just out of their reach, thus compelling them to jump for it.

Keep the nest boxes very clean, supply them with fresh hay, and dust them once a week with a good insect powder. The houses should be whitewashed inside twice or thrice a year. This not only keeps the house sweet, but also makes it lighter than when it is creosoted. A few drops of carbolic may be added to the whitewash when it is mixed. The outside may be painted, tarred, or creosoted as desired.

The Breeds. The best breeds for a small household flock are the non-broody or light breeds such as Leghorns, Anconas, Andalusians, Minorcas, and Campines. The Leghorns and Anconas lay eggs about 2 oz. to 2½ oz. in weight. The Andalusian and Minorca eggs are generally from 2½ oz. to 2½ oz., and sometimes a bit more. The Campines eggs are from 1½ oz. to 2 oz. The Hamburg family are also non sitters and prolific layers, whilst they are among the most beautiful of all fowls, but their eggs are small. All these mentioned lay white eggs.

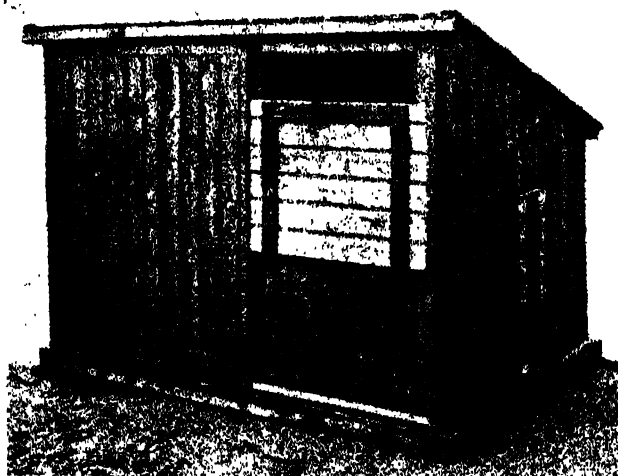
For town and suburban lovers of poultry, whose accommodation is limited in character and who only need the birds as a hobby,



Fig. 3. Useful poultry house, with outside nest boxes, the whole set on wheels for easy transport

Bantams are useful. The breeds to be recommended are the Sebrights (gold and silver), Black Rosecombs, Minorcas, Leghorns, Old English Game, and all the Wyandottes, except the whites and Columbians which are not suitable for town runs. The feather-legged breeds like Pekins and Brahmans are suited for the show man only, and the same may be said of modern game bantams.

Those who have a field, or paddock, in which to keep their birds, may indulge in breeding with consequent pleasure and profit. They have a much larger field from which to select their birds. Among the birds they may choose from are all the sitting breeds such as Wyandottes (Whites, Blacks, Blues, Buffs, Columbians, Gold and Silver laced, Partridge, and Silver-pencilled); Australorps; Orpingtons, Dorkings; Plymouth Rocks (Barred Buff, White, Columbian, and Partridge);



Poultry House. Fig. 2. Strongly built house, small enough and light enough in weight to be easily portable.
Courtesy of T. Bath & Co., Ltd

battens fixed to the top and secured at the bottom to pegs driven into the ground. The front section is then put up in place and similarly supported. Every care must be taken to get this corner square and perfectly upright, otherwise the house will always be lopsided and insecure. A plumb rule proves the latter, while a stout cord, 10 ft. long, attached to hooks fixed exactly 6 ft. from the corner in the end section, and 8 ft. from the corner on the front section, ensures the squareness of these two sections. The corner is bolted together with 5 in. by $\frac{1}{2}$ in. coach bolts and nuts, with a washer beneath the nut. Then the back section is erected and bolted in place. The remaining front, back, and end sections are then erected and bolted together, temporary cross pieces being nailed from side to side, while the internal stretcher section and the ridge pole and struts are nailed in place.

The roof is covered with 3 in. mesh galvanized iron wire netting stretched very tightly, and a covering of tarred felt securely nailed to the top of the section with clout nails. The roof is completed by laying the 6 ft. lengths of galvanized corrugated iron completing the work with a standard galvanized iron ridge capping securely nailed into the ridge pole. This roof costs very little more than an ordinary boarded and felted roof, and is much more durable. The tarred felt lining is essential, as otherwise the condensation would make the interior of the house very damp and uncomfortable. The fronts are enclosed with 2 in. mesh galvanized wire netting, and portable screens made of water-proofed canvas in a wooden framework are provided for use in very wet and cold weather.

Nest Boxes. The nest boxes (Fig. 13) are made to project on the back of the house, and constructed with a weatherboarded hinged top providing easy access for egg collecting. Perches made from 2 in. by 1 in. deal with rounded edges are carried in bearers, and can be lifted out for cleaning. Dropping boards, supported on bearers and legs, are provided with cross battens and lift-out for cleaning. A sliding hen door is fitted at each outside end of the section, and the intermediate section has double folding doors normally closed and bolted. Exterior doors are ledged and braced, hung on 18 in. cross-grain hinges and fitted with a lock and key, and also a turn button on the inside to enable the attendant to close the door while working inside the house. The floor is left in its natural state and covered with a deep bed of litter wherein the hens can scratch for grain. This is good for the birds and keeps them healthy and contented.

A large water vessel, feeding trough and hopper, and a dust bath built in one corner complete the house. Access to the runs is obtained by framed doors covered with 2 in. mesh galvanized iron wire netting, hung on simple hinges and provided with a hook and eye fastener. The combination of run, scratching-shed, and roosting house has always proved satisfactory. In fine weather the birds can be outdoors in the run; in wet weather they are confined in the scratching-shed. On extremely cold and wet days the screens are put up, and the birds are warm and comfortable, and able to seek their food in daylight and also in the dry, with satisfactory results in egg production.

POUNCE POT. Also known as a sand bottle, the pounce pot in silver and Sheffield plate is sought by collectors. It was made for holding sand, which was used before the general employment of blotting paper to sprinkle over writing in order to dry the ink.

POUNCING. Patterns may be pounced on to metal, glass, or pottery by means of a linen bag containing blue chalk. By pouncing is meant that the bag will be dabbed all over the surface of a stencil and will thereby

transfer to the surface of the article itself the outline of the design cut in the stenciled paper. See Stencilling.

POUND. This standard English measure of weight is divided into 16 ounces, and consists, strictly speaking, of 7,000 grains. 14 pounds go to the stone, 28 to the quarter, and 112 to the hundredweight. There are 2,240 pounds to a ton. The usual abbreviation for pound is lb., which is used throughout this work. See Avondupois Weight.

Pound Cake. This is a rich sultana cake, usually baked in a square or oblong, fairly shallow, cake tin. See Cake.

POUT: The Fish. The pout possesses a membrane covering the head and eyes, and which it has the power of inflating. The best known is the whiting pout, a member of the haddock tribe. It makes excellent eating, but must be consumed very shortly after being caught to be in good condition. Large specimens attain the weight of 5 lb., but the smaller fish have the best flavour. They can be cooked by the same methods as are used for haddock.

POWDER. A powder may be described as any substance reduced to fine particles. Powders used in the home may be divided into those used for the toilet, e.g. face and tooth powders, those used for various cleansing purposes, and those taken as medicines.

For the complexion, powders can be had in white, cream, pink, and flesh tints, variously perfumed, and either in solid or loose form. They should be carefully selected both for texture and colour. Many women blend their own by mixing two or three shades until the desired tint is obtained. Other kinds of toilet powders include rice, pearl, violet, and talcum powders.

Cleansing powders include those for cleaning silverware and cutlery; there are also sanitary powders and vermin destroying powders. Powdered soaps are used in washing clothes, while another powder used in the household is baking powder.

The powders used in medicine are reduced to very small particles by a mill, or with pestle and mortar. To give birth, where a small quantity of the drug is to be taken, sugar of milk is frequently included. Powders may be taken by sprinkling on the tongue or in jam or syrup.

POWDER PUFF. Puffs for applying powder to the skin are made chiefly of swansdown, lambs' wool, and beaver fur. For hygienic reasons, no puff should be used too long.

To make a powder puff, cut out a circular piece of swansdown or fur, turn in the edges to the wrong side, and then cover the back with a circular piece of white or coloured silk. If a bone button and ring, or some other type of handle, are attached to the centre back, the puff will be found easier to use. Large puffs intended for powdering the neck, shoulders, and back are fitted with long handles of wood, bone, or tortoiseshell, and are backed with rich satin, narrow ribbon, or floral trimming.

A usual kind of powder puff is a handkerchief puff. Small pieces of coloured swansdown can be purchased and neatly sewn on to the middle of a crêpe de Chine or georgette handkerchief. This may be decorated by painting or pattern printing (q.v.).

On large powder puffs the usual bone button and ring may be substituted by a handle made from a bow of satin ribbon or a small bunch of padded silk covered flowers and fruit. See Baby; Baking Powder; Beauty; Emery Powder; Make-up; Seent; Talcum; Teeth, etc.

Power Grid Detection. See Detector.

PRAIRIE SUNFLOWER. The fine species of perennial sunflower, *Helianthus rigidus*, is a good plant for the garden or for yielding cut flowers. Improved varieties of this prairie



Prairie Sunflower, a favourite species, with flowers ranging through all shades of yellow

sunflower, as it is called, include Miss Melish, Miss Willmott, Daniel Dewar, and Rev. Wolley Dod. All are in varying shades of yellow, the flowers being borne on slender erect stems, 6 ft. or more high.

PRATIA. Being a dwarf plant of trailing habit, pratia is suitable as a creeper for a slightly shady place in the rockery. It belongs to the harebell family. The chief kind is *Pratia angulata*, which grows up only 3 in. high, and during summer bears white flowers; ripens has white flowers followed by red berries. It is best planted in March, and may be increased by division during the same month. See Rock Garden.

PRAWN. In appearance resembling the shrimp, the prawn is larger and more delicate in flavour. Like the shrimp, it is bought ready boiled, and if fresh it should be firm and a good pink in colour. Prawns can also be obtained preserved in tins, in which case they are not only cooked but also shelled.

Preparing Prawns. To shell prawns, take the head and tail in the two hands and pull the prawn straight, giving it a little twist at the same time. In this way practically all the shell will come off with the head and tail, the piece that remains can quite easily be removed.

Cut some large tomatoes in slices, and on each slice place a thin slice of cucumber and then 2 prawns. Prepare some thin bread and butter, spread it over with anchovy paste, mixed if liked with tomato sauce. Cut the bread and butter into strips, roll them up, and place them on the dish between the tomato slices. Another way is to place the prawns on a thin slice of lemon, and garnish them with parsley or sprigs of watercress.

To prepare prawns in aspic, line some small dariole moulds with aspic jelly, and leave them until the jelly is nearly set, when some finely chopped olives, or pickled gherkins, and some chopped lobster coral is sprinkled over it. Then put 2 large prawns or 3 small ones into each mould, fill them up with more aspic, and



Prawns in aspic served on croûtes of fried bread spread with green butter

put in a cool place or on ice to set. Meanwhile make as many croûtes of fried bread as there are dariole moulds, and spread them with green butter. This is made by placing $1\frac{1}{2}$ oz. mixed and washed herbs, comprising parsley, tarragon, chervil, and chives, in a saucepan of cold water and boiling them; dry thoroughly with a clean cloth, and pound in a mortar with 3 oz. butter (or margarine), a little anchovy essence, and seasoning, afterwards rubbing the mixture through a sieve.

When the prawns are to be served, a mould is turned out upon each prepared croûte, and one is served to each person.

To preserve prawns whole in butter, shell 1 pint of prawns, and pack them closely in shallow china pots. Crush the shells roughly, and put them, with $\frac{1}{2}$ lb. butter (or margarine) into a jam-jar in a pot of boiling water. When the butter is thoroughly melted strain it free of shell, flavour it with cayenne, nutmeg, and a little salt, and pour it over the prawns. More melted butter should be added when this is cold, if the pots are not full. Tie them down, and store them in a cool, dry place.

Prawn Patties. While the puff pastry (see page 990) for these patties is cooking, the filling can be prepared. Make a plain

their elder brothers and before their younger brothers' wives. Daughters of peers marrying peers of lower degree take the same order of precedence as their husbands, thus the daughter of a duke marrying a baron degrades to the rank of baroness, while her sisters married to commoners retain their rank. More official rank on the husband's part does not give similar precedence to the wife. See *Dinner Party; Etiquette*.

PREGNANCY. The fact of conception may be shown, or at any rate suggested, almost at once by nausea, sickness, or an ill defined sensation of some sort, but much more commonly it is not suspected till the failure of a menstrual period. Morning sickness may appear very early in pregnancy, but as a general rule it appears towards the end of the first month, lasts two or three months, and disappears.

As soon as a woman finds herself pregnant she can generally, by consulting a doctor, find out within a week or two the probable date of her confinement. She is thus able to engage a doctor and a nurse. The duration of pregnancy is about 40 weeks, that is to say, 10 lunar months or 9 calendar months. There are various methods of calculating the date of a confinement. One is to count back 3 months from the beginning of the last period, and to add 10 days.

Pregnancy does not, and as a rule need not, interfere with the ordinary routine of a woman's life and duties. She should be careful to avoid physical strain or shock, such as is involved in lifting weights, in journeying in jolting vehicles or in occupations in which

there is prolonged standing.

She should take open-air exercise every day, and should live in well-ventilated rooms. She should have a sufficiency of rest at night, and as her pregnancy advances she will, as a rule, find it desirable to be down for a little several times during the day. It may be a comfort to her and make exercise more easy if she wears a properly fitted obstetric belt. Her dress should be loose. She should have plenty of plain food. It may be well to supplement the ordinary diet with a free allowance of milk.

Constipation is apt to be troublesome, and an attempt should be made to obviate it by including porridge, brown bread, vegetables, and fruit in the diet. Should an aperient be required a teaspoonful or more of castor oil at bedtime may be sufficient, and may be taken every night if necessary; or liquorice powder or cascara may equally serve the purpose. The use of strong purgatives is dangerous.

The drawbacks of morning sickness may be avoided by having a light breakfast in bed and an hour's rest before getting up. A woman

should keep in touch with her doctor throughout her pregnancy. See *Baby; Childbirth*.

PRESERVATIVE: In Food. The use of chemical preservatives for food can hardly be dispensed with, as so much food is imported and both this and home-produced food require to be stored, sometimes for considerable periods. Some chemicals used for preserving are harmful if taken in the amounts which might well be ingested in the course of ordinary diets containing a fair proportion of preserved food. Boracic acid, once used extensively, is an example.

In Great Britain the Public Health (Preservatives, etc., in Food) Regulations prescribe the articles which may contain chemical preservatives, the appropriate preservative and amount in each. The only preservatives allowed are sulphurous acid and benzoic acid. See *Adulteration; Food*.

PRESERVING: Of Food. Fruit, vegetables, meat or fish may be preserved and sterilized by a simple method and the use of the outfit illustrated. This is an economy to the housewife, as foods may be purchased when prices are low, or home-grown vegetables and fruits may be preserved during the plentiful season. The shelves of the larder may be stocked with jars of chicken, fish, game, soups, fruit or vegetables which have been preserved, and will keep for years owing to efficient sterilization without the use of chemicals.

The Process Described. The process is simple and fuel saving. The jars are first filled, placed on the combined holder and stand as shown in the illustration, and then put into the sterilizer. When the water at the bottom of the sterilizer reaches the correct temperature the jars are hermetically sealed. No screwing covers are needed, the glass covers are self sealing and the contents can be preserved for years. The natural juices and vitamins are retained, and the food kept pure and wholesome. With the combined holder and stand all the jars can be placed into the sterilizer or taken out with one operation. The stand is supplied with six clips for holding jars securely in position. Shallow jars can be placed one on top of the other. The thermometer is protected by a steel sheath and is clearly charted to show the correct temperature for sterilizing various foods, milk, etc. The special jars can be obtained in several sizes and are guaranteed against breakage by heat.

Preserving Pan. This shallow pan for making jam or marmalade is usually made of brass, copper, or aluminium, but other qualities can



Prawn Patties, consisting of puff pastry cases, with a filling made from white sauce, small pieces of prawn and some grated cheese

white sauce, and add to it $\frac{1}{2}$ gill shelled prawns cut into small pieces. Make the mixture thoroughly hot in a pan over the fire, then stir in 4 tablespoonfuls grated cheese and salt and pepper to taste. When the cheese has melted, fill the pastry cases with the mixture, and garnish the top of each patty with a prawn's head.

Prawn Sauce. This sauce can be served with any white fish. To make it, prepare 1 pint melted butter sauce, season it to taste, and add $\frac{1}{2}$ a teaspoonful lemon juice and a few drops anchovy essence. Then drop in $\frac{1}{2}$ pint shelled prawns, and the sauce is ready. See *Aspic; Curry; Hors d'Oeuvre; Patty; Salad*.

PRECEDENCE. Precedence is the order in which individuals follow one another at state and other public ceremonies. There is also an order of precedence for private gatherings, although this is not so rigid. Their precedence is usually given to the guests in order of their rank and social standing.

For state ceremonies, there is a regular order of precedence for peers and officials. The Sovereign comes first, then a prince of Wales, and other male members of the royal family. Next come the archbishop of Canterbury, the Lord Chancellor, the archbishop of York, and the prime minister, in the order named. Other high officials follow, and then come the peers, rank after rank. After the peers come a number of other persons, sons of peers, baronets, knights, and other members of the various orders.

Women take the same rank as their husbands, or as their eldest brothers. Daughters of peers rank immediately after the wives of



Preserving and sterilizing outfit, comprising sterilizer, thermometer, combined holder and stand, and glass jars

be obtained in tin, iron, or enamelled ware. The iron ones are not to be recommended, as they often discolour their contents, while the tin and enamel pans quickly become overheated and so cause the jam to burn unless the latter is kept well stirred. Enamel pans are also liable to chip.

PRESSED BEEF. To prepare this procure a piece of brisket of beef weighing from 5 to 6 lb.; see that it is well covered with fat and neat-looking, also perfectly free from the slightest taint. Wipe it and lay it on one side while preparing the brine. Mix well in an earthenware pan 2 lb. common salt, 1 oz. saltpetre, $3\frac{1}{2}$ oz. raw sugar, 1 bay-leaf bruised, 1 small teaspoonful mixed sweet herbs, which have been sifted, 1 blade mace, and 4 cloves.

Bone the meat, immerse it in the pickle in the pan, and rub it well with this mixture all over, doing this for about 5 min. Keep it in a cool place, and every day for 5 days turn the meat and rub it as on the first day, taking care that it is left on the side which has been turned over. The joint must remain in the salt for from 12 to 15 days, but after the first five days it need not be rubbed, only turned each day. The saltpetre gives the red tint.

To cook the meat, wash it free from salt in cold water, then lay it in a saucepan large enough to give it plenty of room. Cover it with cold water and boil it up, skimming it very carefully. Add 20 peppercorns, 3 carrots, 2 onions, each stuck with 2 cloves, 1 head of celery, and 2 turnips. All the vegetables should be prepared and cut into pieces of convenient size. Simmer the whole gently for 4 or 5 hours, or until it is very tender, skimming occasionally. When cooked, take up the meat, drain it and lay it on a deep dish, quite flat. Cover it over with a second dish and arrange on the top sufficient weight to press the brisket into an oblong shape.

When cold, remove the weight and covering dish, and trim the meat; then glaze it and dish it, garnished with parsley. The bones removed from the brisket can be added to the contents of the stock-pot, or boiled down separately with a little vegetable and converted into glaze. The stock left over from cooking the meat may either be served as a broth, with the addition of suet dumplings, or it may be used as the foundation of a brown soup. Brisket is too fat for some tastes, and a piece of silver-side or round of beef may be substituted.

Brisket can be bought ready salted and cooked in the same way. See Beef.

PRESSING : Of Clothes.

Pressing is one of the most important items in the care of clothes, as it prevents them from losing their shape. When pressing is done systematically by means of a clothes press, it is seldom necessary to resort to other treatment; but with garments where this method is not practicable, steam pressing is usually effective.



Pressing. Sword iron, heated by electricity, for pressing men's ties

Steam pressing can be done at home with the aid of a hot iron and a damp cloth. The latter should be of linen or calico or some similarly thin material.

Press heavily on the iron so as to remove any creases, and continue pressing until the cloth is dry, taking care that it does not become singed. If the garment itself is wet when pressed, the cloth that covers it should not be damped. The iron must not touch the garment itself, otherwise a shiny appearance may quite likely develop.

Any cleaning that is required should be done before pressing. A special iron for pressing men's ties is shown in the illustration. The "sword" is heated by electricity in the ordinary way and the tie is stretched on to it after the silk has been slightly damped. See Clothes: Ironing.

PRESSURE COOKER. Food cooked by steam pressure in a pressure cooker requires only a very short time owing to the high concentration of the steam inside the cooker.



Pressure cooker consisting of a casserole with food containers. The food is cooked by steam pressure, which is regulated by a special device (courtesy of Harrods Ltd)

There are several makes of pressure cooker on the market, but the principle is identical in all of them. The cooker is really a strongly made casserole, with food containers and a lid which fits internally into the cooker. This is held in position with a locking bar. When the lid is in position no steam can escape; the greater the steam pressure the more securely the lid is held in position, and the lid cannot be removed while the steam pressure remains. The lid is fitted with a whistle device, the function of which is to regulate the cooking of the food, and when sufficient pressure has been generated the whistle blows and warns the user to remove the cooker from the gas or other heat. The whistle is marked with numbers on the movable top half and with a red line at the base, and one of these numbers is set to the red line according to the kind of food which is being cooked. There is also a safety valve on the lid.

Inside the cooker are basket containers for vegetables, also a combined lifter grid and strainer. It is possible to cook a complete meal in a pressure cooker, as each food keeps its own flavour, and does not affect that of others. Greens retain their colour, and dried vegetables can be cooked in a few minutes without soaking. There is very little shrinkage or loss in cooking, and all the natural juices and valuable salts are retained. For stewing or boiling, cold water is put into the cooker to the depth of 1 in. to $1\frac{1}{2}$ in., for roasting, boiling fat is put in.

Below are a few examples of the time taken for various foods to cook in a pressure cooker. Roast chicken, 6-10 minutes instead of 40-60 minutes. Roast joint, 12-15 minutes instead of 2 hours or longer. Stewed meats, 12

minutes instead of 2-3 hours. Potatoes, 8 minutes instead of 20-25 minutes. Green vegetables, 7-10 minutes instead of 25 minutes. Dried vegetables, 20 minutes instead of 2-3 hours. See Digesters.

PRICKING-OUT : Of Plants. The process of transplanting the seedlings as soon as possible after they have made their first true leaf in addition to the seed leaves is termed pricking-out. It requires care, and where the seedlings are very small a thin, flat stick, notched V-shape at one end, should be used to lift them from the seed pan or box.

Tender seedlings raised under glass should be pricked out into pots or pans, at distances apart according to their habit of growth; they will require careful shading and watering for some time after pricking out, and must be kept under glass until established. Outdoor plants raised in heat must be hardened off before permanent planting.

Seedlings raised directly in the open may be thinned out instead of pricked out, and, where necessary, transplanted when 3 or 4 true leaves have formed.

PRICKLY HEAT. In the tropics Europeans frequently suffer from the skin disorder known as prickly heat. It produces intolerable tingling, pricking, and itching, and is due to obstruction of the sweat ducts. Small red pimples, no larger than a pin's head, cover the arms, breast, neck, shoulders, and thighs.

Rest in a cool, shady place, if practicable, is one of the best measures. Cold and hot drinks, spirits and wine, are to be avoided. So are hot baths, especially with the use of soap. Many remedies are recommended, of which the best appears to be a mixture of 8 parts of olive oil and 1 part of lanolin rubbed into the skin night and morning.

A tepid alkaline bath has sometimes a very soothing effect. It is made by adding 1 oz. of bicarbonate of soda to each gallon of water. Or a tepid bath of plain water may be taken, the skin being afterwards rubbed with lemon-juice, or carbolic lotion (1 part carbolic to 60 parts water), or calamine ointment, or dusted with a powder made of equal parts of oxide of zinc, boric acid, and starch.

PRICKLY PEAR. This is the common name of opuntia, one of the cacti. It is usually cultivated in pots under glass in a collection of cacti, but a few, notably monacantha and vulgaris, can be grown on a sunny, well-drained rockery at the foot of a wall.

PRICKLY THRIFT. This is the popular name of a rock garden plant, acantholimon, which forms a low evergreen tuft of spiny



Prickly Thrift. Rose-coloured flowers of a rockery plant which requires a sunny position

leaves and bears rose-coloured flowers in summer. It needs well-drained sandy loam and a sunny position, and is increased by cuttings in a frame in August. *Acantholimon glutacum* and *venustum* are the chief kinds: both have rose-coloured flowers.

PRIMING: For Painting. As applied to house painting and similar work, priming is an undercoating or groundwork for subsequent coats of paint or enamel. Proprietary brands are made up specially for woodwork, metal, or stone. The amateur can make his own by mixing red lead in paste or powder form with white lead and linseed oil thinned with turpentine, and a little driers added. This is brushed well into the woodwork immediately it has been prepared. The advantage of a priming coat is that it works well into the wood and acts as a



Priming paint applied as a groundwork to raw timber

durable base for the paint that follows, which would otherwise peel off after exposure to wind and weather. See *Paint*.

PRIMROSE. This is the popular name of the spring-flowering *Primula vulgaris* and its varieties. Primroses are natives of hedgerows, banks, woods, and the sides of streams, and when found wild they may be dug up and brought into cultivation. They are increased by division after flowering or by seeds sown in spring in a frame. The blue primroses are great favourites and the double varieties are charming flowers. Primroses like slight shade in moist, loamy soil. See *Auricula*; *Himalayan Primrose*; *Polyanthus*.

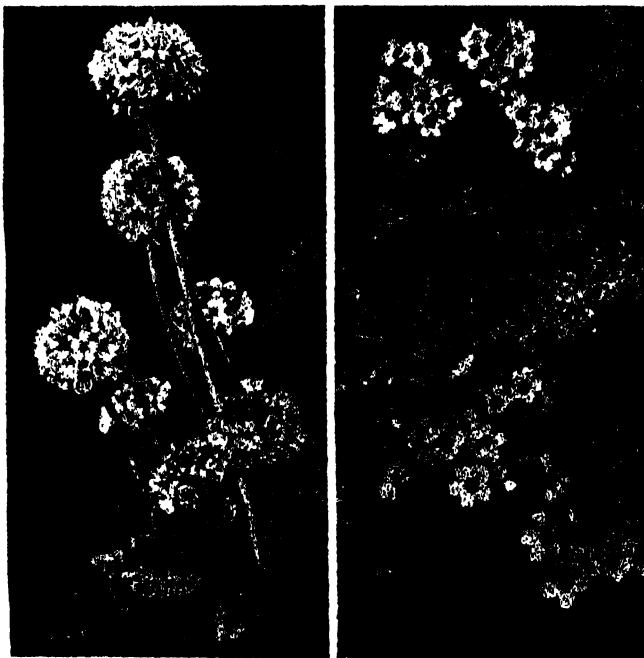
PRIMULA. This group of hardy and greenhouse plants is of the utmost importance to the gardener, for many of the species and varieties are invaluable for spring and summer blooming out of doors or for providing a show of flowers under glass in winter and spring.

There are two chief types of hardy primula, those which flourish best in partial shade in deep, moist soil, and others which thrive when planted in crevices of the rock garden. Among those which need deep, moist

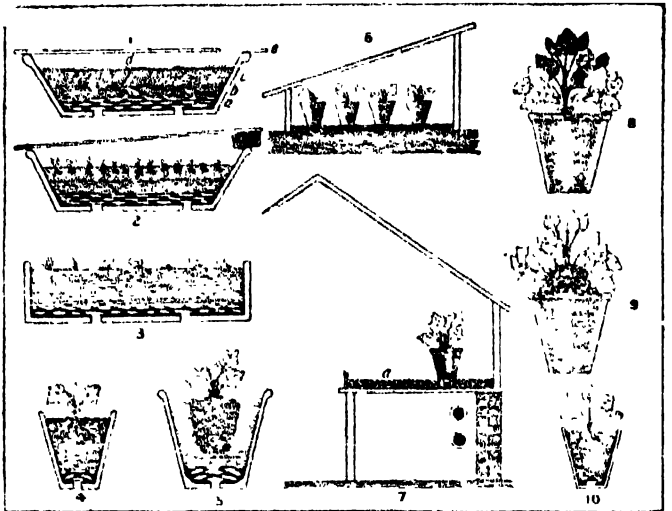
soil there are some remarkable plants. These are some of the best: *beccuana*, 2 ft., reddish-purple and yellow; *cockburniana*, 10 in., orange scarlet; *denticulata*, 12 in., lilac; *frondosa*, 6 in., lilac-rose; *japonica*, 24-30 in., various colours; *Florindae*, two feet, primrose-yellow; *pulverulenta*, 24-30 in., of rich and varied colouring; *rosea*, 6 in., carmine rose; *sikkimensis*, 2 ft., pale yellow. In addition to these, numerous hybrid or cross-bred forms have been raised.

Some of them are doubtful perennials in many gardens, and it is wise to raise them from seeds every year to ensure vigorous free-blooming plants. The seeds ought to be sown as soon as possible after they are ripe in late summer or early autumn. If they do not germinate before winter the pots of seeds should be kept out of doors exposed to all weathers until March, then if they are placed in a frame or greenhouse the seedlings will soon appear. If when large enough the seedlings are transplanted into boxes of soil and later on planted out of doors they will bloom the following year. Deep loamy and leafy soil which does not dry out in hot weather suits them best, and slight shade is beneficial. Planting may be done in autumn or spring.

Most of the rock-loving primulas will thrive in crevices in the rock garden if planted in a compost of loam and leaf-mould with grit added freely. Among them are *glutinosa*, violet; *nivalis*, white; and *viscosa*, rosy purple. Others which need a similar compost with lime or mortar rubble added are *auricula*, yellow; *clusiana*, reddish purple; *marginata*, lavender; and *spectabilis*, rosy-lilac. All are low growing and benefit by slight shade.



Primula. Left, tuft-like flower heads of the species *denticulata*, which needs a moist situation. Right, *P. variabilis*, a rock-garden flower



Primula. 1. How to sow; a, crocks; b, chopped old turf; c, fine soil; d, seed sown on top; e, glass. 2. Seedlings ready for pricking out. 3. Seedlings pricked out in box. 4. First potting. 5. Second potting. 6. Plants placed in cold frame. 7. Position in greenhouse; a, moist shingle. 8. Method of propagation by shoots slit at base, as shown by unshaded portions. 9. Shoots beaped with moss to make roots firm. 10. Rooted shoot potted separately

By special arrangement with the Amateur Gardening

As regards planting, this should be carried out in early autumn or in spring.

Several of the primulas are charming winter and spring flowering greenhouse plants which can be grown to perfection in a minimum temperature of 50 degrees. The Chinese primulas (*sinensis* and *stellata*), of which there are numerous varieties in rose, crimson, salmon and other colours, are the most valuable. The yellow flowered *Kewensis* and *floribunda*, the pale yellow *verticillata* and the fairy primrose (*malacoides*) in lilac, mauve and rose are others to be recommended. *Primula obconica* is a showy kind with bluish, rose or crimson flowers. Gloves should be worn when handling the plants or the hairs on the leaves may cause irritation of the skin.

Seeds of primulas *sinensis* and *stellata* should be sown in pans of fine soil in a frame in May. During summer the plants must be grown in a cool, shady frame, and in September they should be placed in the greenhouse. A suitable potting compost consists of loam two-thirds and leaf-mould one-third, with sand added freely. Pots 5 to 6 in. wide are large enough for the final potting.

Seeds of primulas *floribunda*, *Kewensis* and *verticillata* should be sown in April; those of *malacoides* in April and June to maintain a succession of bloom. *Primula obconica* should be sown in March in order to provide plants in bloom in winter. These need the same treatment as the Chinese primulas. See *Flower Garden*, *Potting*, *Pricking Out*; *Rock Garden*.

PRINCE'S FEATHER. This is the common name of a half-hardy annual (*Amarantus hypochondriacus*), which bears spikes of crimson flowers on stems 3 ft. or more high in summer. It is raised from seeds sown in a heated glasshouse in March, the seedlings being planted out in May. Other favourite allied plants are love-lies-bleeding (*Amarantus caudatus*), and Joseph's Coat (*Amarantus tricolor*).

PRINT: The Material. Many kinds of cloth are printed with designs, but the name print is most often given to simple cottons, useful for aprons, working overalls and dresses, or for dust sheets. Print can be pasted down as a lining to wooden boxes or cupboards, and it can be employed as a backing to curtains made of washing material. Old print dresses can be cut up to make capital dusters, and when these are worn out they are still useful for wiping grease from machinery or for polishers for floors, furniture, or boots.

PRINT: How to Choose. Print collecting is still a hobby open to people of moderate means. Most old print shops have hundreds of prints put away in portfolios through which the would-be collector may look and find treasures, ranging from a few pence to a considerable sum apiece.

The collector's first business is to learn to identify the different processes of engraving and cutting by which the print is evolved. The broad distinction between an etching and a mezzotint or a lithograph is fairly evident at sight. But it is not so easy to tell the difference between an engraving on steel and one on copper, or to know at a glance the mixed processes employed to produce a certain kind of etching. Only by watching an operator at work on a plate through all its stages can absolute certainty be gained as to the way it is done.

Londoners have access to some of the finest prints in the world at the British Museum, at the Victoria and Albert Museum, and the Guildhall; but all over the country there are plenty of good prints to be seen. Yet the most valuable experience is that gained in the shop. For prints of all descriptions, the inexperienced collector's safest guide is an intelligent and honest printseller.

It should be remembered that prints of views, topical events, and sports, if good in themselves, are bound to increase in value. Anyone who decides to specialise in a particular subject may soon acquire an interesting and really valuable collection.

While etchings by great masters, such as Rembrandt, Albrecht Dürer, and Whistler, and colour prints after Morand, Wheatley, and other artists are beyond the reach of the ordinary collector, there are many decorative prints in colour or monochrome which can be picked up for comparatively small sums.

The collector's Japanese prints form a class in themselves and are nearly always pleasing, and those by the less known names may often be bought cheap. One should, however, remember that the Japanese produce a large class of prints solely for export, and they are not of the best quality.

Plate Marks. Every collector is warned against the purchase of prints lacking the slight indentation that shows where the plate has been pressed on the paper; yet a print without a plate mark is not necessarily a fake. Absence of the mark may simply be the result of printing from a plate larger than the paper. The illustrations, for instance, to Scott's novels and Rogers' poems were printed from plates larger than the pages of the book, and there are hundreds of similar cases where the plate mark has disappeared for this reason.

False margins can generally be detected by holding the print up to the light, just as the most cleverly executed repair of a hole or tear in the specimen betrays itself if the light is strong enough. Touch can often determine the age of a print by revealing the texture of the paper. Modern paper is hard and harsh compared with 18th century and older paper. This test, however, is not infallible.

A finger passed lightly over the surface of a print should show whether it is genuine or a clever photographic reproduction.

Baxter Prints. Genuine Baxter prints, the work of George Baxter, are valued by collectors. Baxter illustrated a large number of books, producing frontispieces and vignettes in addition to separate pictures. Many of these were used to illustrate pieces of music, and valuable Baxter prints have been discovered in this way, especially portraits about 4½ in. long, into which he put some of his best work. Some printing firms were afterwards licensed to use the Baxter process, which consisted in building up beautifully coloured prints by the use of many blocks; but the work of these licensees never equalled the originals either

in colour or finish. Some of them bear the name of Baxter, and collectors are very liable to be misled by these. Genuine examples bear the name of the artist and one or other of his various addresses in London: they have good mounts and are generally clean and unframed. Baxter's brilliant and lasting colours being one of the principal secrets of his remarkable success.

There was no 3-colour process in Baxter's day: each colour in a picture had to be applied separately and in this Baxter excelled. He started with an engraving, originally on wood, later copper, and then steel, printing in black, brown, or purple. This was the

foundation. After that he applied his colours with a series of wood blocks, letting one impression dry and then adding another.

The variety of colours is always a striking feature of his work, from 8 to 20 different colours or tints being found in a single print. The register is always perfect; that is to say, each colour is fitted exactly into its place. This is one of the characteristics of a Baxter print; another is the beauty of the colouring. Baxter ground and mixed his own colours, and was very particular in his choice of paper. He engraved the plates himself, and personally superintended every stage in the production of his prints. See Picture

PRINTING AND PRINTING FRAMES

The Best Methods for the Amateur Photographic Worker

For the photographer who carries out the technical processes of his hobby clear instructions are given under this and the relative headings, Developing; Enlarging; Fixing; Negative-Washing. See also Gaslight Paper; P.O.P.; Self-toning Paper.

Photographic printing processes are divided into two classes. The first and oldest, and apparently simplest, is the printing-out method in which daylight is allowed to act on sensitive paper behind a negative, the action continuing until all details of the image are visible. The paper which is used in this process is called printing out paper or P.O.P. (q.v.).

In the second method, called the development method, artificial light is used, and the exposure of the sensitive paper is very much shorter, no visible image being produced until the paper is treated with a chemical developer.

In both P.O.P. and development papers the negative is held in a printing frame for exposure, since it is essential that the sensitive paper should be closely and evenly in contact with negative and also that light should not leak in through the edges of a glass negative. Printing frames can be bought cheaply if a number are required, they can be made as described later.

When printing films it is necessary to place a piece of clean glass in the frame first, then the film, followed by the paper, the sensitive side of the film being in contact with the paper, or the image will not be quite so sharp and will also be reversed. A waste negative glass of the right size for the frame, carefully cleaned, will serve best for the film support, keeping it flat and in close contact with the printing paper. If glass negatives are being printed see that the glass side is thoroughly cleaned and without smears or finger marks, for any marks will appear in the print, particularly if it is on gaslight paper. Care must also be taken to see that the negative is thoroughly dry, or it will adhere to the sensitive paper, spoiling the negative and causing silver stains on it, which are extremely difficult to remove. Take great care to see that the paper itself is not handled with moist or dirty fingers.

When printing in daylight on P.O.P. the frame should be filled in dull light or shadow, and the printing should be carried out in diffused light, never in direct sunlight, except perhaps in weak sunlight from November to February. Too strong a light reduces the contrasts even in a good negative, and gives flat, dull prints. Weaker light, well diffused, increases contrasts and brightens the prints. Place the frame on the window-sill out of the sun, but with an uninterrupted view of the sky. After a short time the print is examined in a dull light by opening one half of the hinged back of the frame.

See that the paper is not pulled or disturbed in any way, or a double and blurred image will appear on the finished print. Depth of printing varies somewhat according to the paper and toning bath used, but as a general rule it should be carried on until the whites of the picture are well coloured and the

shadows begin to appear solid. Fixing and toning should be carried out as soon as possible after printing, as P.O.P. tends to discolour if kept after printing and will not tone so well.

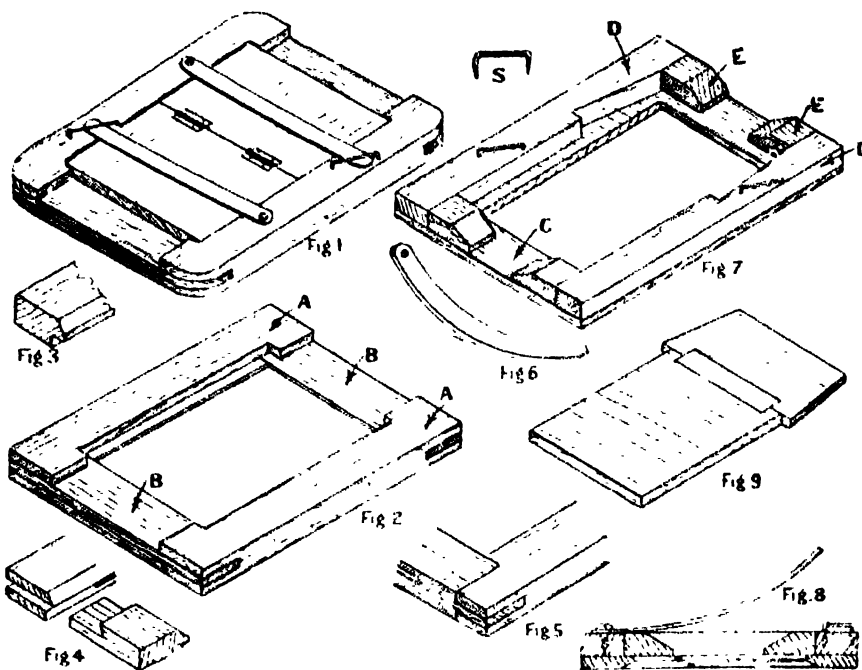
All prints, whether on P.O.P., gaslight, or bromide paper, are much more effective if a white margin appears round the photograph proper. This is obtained by the use of a mask, best cut to fit the particular photograph from opaque paper flat and uncrumpled such as the black paper used for wrapping sensitive plates. A sharp knife or a mounted razor blade must be used to cut the mask since clean, straight edges are essential. Sets of masks may be bought, but those of oval shape or with rounded corners should not be used, for their effect is most artistic.

To get clouds visible in a negative to print properly on P.O.P. paper it is necessary to shield the ground portion of the negative for part of the time during printing by placing a card over the frame, and so allowing the sky portion extra time for printing. The card should not touch the glass, but should be about ½ in. to 1 in. away from it, and moved occasionally, or a sharp line will appear in the print. In a similar way, when there are no clouds in the negative, the sky portion being opaque, the print will be improved if, instead of appearing a blank white, it shows some tone of varying density.

To do this, expose the paper first in the frame through plain glass, covering all but the topmost (sky) portion of the negative with a card as before, gradually moving the card downward so that the top of the print has the longest exposure and shows a decided tint. The finished picture will be a graduated sky of much more natural appearance than if left blank. This process is called sunning-down. When printed P.O.P. papers are toned and fixed together with self-toning papers the two operations of toning and fixing are combined in one.

Printing Frame. Several kinds of frames for making photographic prints and suitable for all sizes in negatives, are obtainable. Although generally made in wood, some are made of metal, two kinds of the former being shown in Figs. 1 and 7. The framework of the first is shown in detail in Fig. 2, and for sizes up to whole plate the material can be the same size in section.

Taking the dimensions of a ½-plate frame as a guide, the two sides A should be 6 in. by 1 in. by ½ in., and the ends 5 in. by 1 in. by ½ in. In order to reduce the thickness of material close to the negative, the top edge of the wood should be planed to a chamfer, as in Fig. 3, and the mortise and tenon joint cut as in Fig. 4. The thickness of the tenon is ½ in., but, before cutting, allowance must be made for the chamfer and also the rebate, this being ¼ in. deep and ¼ in. inward. The



Printing Frame. Fig. 1. Frame with mortise and tenon corners. Fig. 2. View showing joint and rebate. Fig. 3. Section of side. Fig. 4. Detail of joint. Fig. 5. Alternative joint. Fig. 6. Spring. Fig. 7. Another method of making frame. Fig. 8. Section showing spring and staple. Fig. 9. Hinged back.

rebate is cut in order to leave a projection at the ends, Fig. 2.

The simplest way of making the frame is to chamfer the two lengths A, cut out the recess to leave $\frac{1}{4}$ in. at each end and to cut the mortise to a depth of 1 in. The ends B are first notched on the side so that the bottom of the inclined shoulder is 1 in. from the end. After gluing up the corners can be rounded as shown. An alternative method of forming the joint is shown in Fig. 5, the top chamfer being made after the joints are cut. The spring should be of hard rolled brass, hammered to form a curve, as in Fig. 6, a suitable width being $\frac{1}{8}$ in., the length for a $\frac{1}{4}$ -plate being $4\frac{1}{2}$ in. Staples as at S should be made from $\frac{1}{8}$ in. hard brass wire and driven in the wood.

For the plywood frame in Fig. 7 the bottom piece C should be for a frame of the same size as Fig. 1, 6 in. by 5 in., the top pieces D 6 in. by 1 in. by $\frac{1}{4}$ in., and the end pieces E $1\frac{1}{2}$ in. by 1 in. by $\frac{1}{4}$ in. Cut the sloping recesses in the sides D to a length of about 2 in. and a depth of $\frac{1}{4}$ in., and then glue on, with end pieces E butted against them.

The springs are now prepared and screwed on as in the section in Fig. 8, and a staple fitted to each spring. The hinged back for the first frame is made from $\frac{1}{4}$ in. wood, each portion being $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in., hinged together with small brass butts. The back for the second shown in Fig. 9, is made from two pieces, one to fit in the recessed portion and the other beyond it. Brass hinges can be used, or a strip of linen cloth glued on.

PRISONER'S BASE. This game can be played in a garden or playground by any number of children up to about 40. The ground should be marked into two equal portions, and at each end a base established. If played in a yard these can be marked with chalk, the base being 5 ft. each way.

When the players have been divided into two equal parties the game begins. At first they attack capture by venturing into the enemy's ground, or remain on the watch for those who enter their own. Those who are caught by being tagged are placed as prisoners in the base, but can be released if touched by a free member of their own side. Both prisoner and rescuer can be tagged and brought back to

prison before reaching their own ground. A game is won when one side has made prisoners of all its opponents, or when a free man enters his opponent's prison when it is empty.

PRIVET: The Shrub. This is the commonest of all hedge shrubs and it is scarcely surpassed for forming a close hedge quickly, but it needs to be clipped frequently during the summer months and impoverishes the ground near by. The plants should be set in autumn at 15 in. apart; a thick hedge is assured most quickly by planting a double row the plants in one row alternating with those in the other. In the following spring they should be pruned to within 12 in. or so of the base to make them branch out. The common privet is *Ligustrum vulgare*, but the oval-leaved privet (*Ligustrum ovalifolium*) is a better shrub with larger leaves which are almost

evergreen. The golden-leaved privet is a favourite hedge shrub; it varies a good deal in colour and it is wise to choose the plants in a nursery.

Several of the privets are worth cultivation as decorative shrubs: two of the best are japonicum, 4-5 ft., and lucidum, 15 ft., both bear white flowers in summer. Privet is easily increased by cuttings inserted out of doors in October or in a frame in August. See Hedge, Quick.

PROBATE: Of a Will. When a man dies leaving a will his executors cannot handle his estate until they have proved, or taken out probate of, his will. This is accomplished by taking the will either to a local registry or to Somerset House, together with a copy, leaving the original there, and receiving from the officials a copy written on parchment and sealed with the seal of the probate division of the high court. This is called a probate copy, armed with which the executor can collect the estate and deal with it.

Any person who wishes to dispute a will must enter a caveat on a form provided by Somerset House in London (fee 1/-) or a probate registry. This form is to the effect that no will of X Y deceased is to be admitted to probate without notice to the objector or his solicitor. The caveat remains in force for six months and may be renewed. Anyone who wishes to prove a will of X Y deceased must first search and see if there is a caveat. If he finds one, he must give notice to the objector called a 'warning summons' (fee 2/6). Unless the objector enters an appearance to the warning summons the caveat expires. If an appearance is entered by the objector it will be necessary to prove the will in solemn form by litigation.

The action is heard in the probate division of the high court, when the witnesses to the will come and give their evidence on oath, the objector is allowed to call evidence to show either that the will was not executed according to law or that the testator was of unsound mind or subject to undue influence or the like. If the will is pronounced valid, it is then said to be proved in solemn form.

The ordinary probate of a will is called proof in common form. The following documents are required: (1) an affidavit according to the form which can be obtained from Somerset House or the local registry containing all particulars of the deceased's estate; (2) an oath of executors proving the death, will, etc.; (3) renunciation by any executor where necessary; (4) engrossment of the will and any codicils on official engrossment sheets of special paper; (5) where necessary an affidavit of due execution of the will; (6) a certificate of reason of delay where the application is made after a lapse of 3 years from the testator's death in order to enable the estate duty to be assessed. If the deceased left a will but either named no executor or the executor whom he named is dead, then the person who would be entitled to administration if he had died intestate is also entitled to be administrator with the will annexed. As a rule, administration is granted to the residuary legatee, because it is clearly to his interest that the deceased's estate should be properly administered, he being entitled to what is left after paying debts and the various legacies devised under the will. See Executor; Legacy; Will.

PROGRESSIVE PARTY. A progressive party may be held in one's own house, or, if it is desired to invite a large number of people, it may be equally well held in a hall hired for the occasion. What is the most suitable game, as bridge is too scientific to admit of the casual play and constant change of partners and talks which occur during the evening's entertainment. It is important that the tables should not be too close together, and that circulation should be easy. Also that one or two people should be in reserve in case



Privet. Sprays of *Ligustrum vulgare*, the common privet.

some player disappoints. Each table should have its number clearly marked.

The best time-table is as follows: Allow $\frac{1}{2}$ hour for the guests to arrive, to serve coffee or any light refreshments, to hand out scoring cards, and for the arrangement of partners. Play may last for $1\frac{1}{2}$ hours, and another $\frac{1}{2}$ hour will serve to circulate refreshments and present the prizes. It is a great mistake to allow the play to last too long, as after a certain time things may begin to drag.

It is best to leave the arrangement of partners to chance, and to let them find each other by one of the ordinary methods, such as the pairing of words. Each man's card should have the table number written on it, and there should be two men for each table.

Play must start with the ringing of a bell, it should continue from 5 to 10 min., and cease when the bell rings again. The winning couple, when the scores have been filled in, then move to other tables. Usually the woman moves to the next highest number and the man to the lower one. This ensures that the majority of people shall meet each other in the course of the evening. The losing couple remain at the same tables as before, but when the new arrivals come they change partners. When play ceases the scoring cards should be handed in to host or hostess, and the players go into another room for refreshments while the results are checked and graded. These will then be announced and the prizes presented. There should be at least one prize for the first woman and one for the first man. Beyond that, the matter is left to the means and discretion of the host and hostess. See Evening Party; Whist.

PROHIBITED DEGREE: In Marriage.

In the Book of Common Prayer of the Church of England there is printed a table of kindred and affinity showing whom a man or a woman may not lawfully marry.

It is now permissible for a man to marry the sister of his deceased wife or for a woman to marry the brother of her deceased husband. It is not, however, lawful to marry the sister (or brother) of a divorced wife (or husband) who is still alive. A marriage is now legal also between a man and his deceased wife's niece (i.e., by marriage) and between a woman and her deceased husband's nephew (i.e., by marriage). A clergyman is not subject to any penalty for refusing to officiate at any of the above marriages. See Marriage.

PROMISSORY NOTE. By the Bills of Exchange Act, 1882, a promissory note is defined as an unconditional promise in writing made by one person to another, signed by the maker, engaging to pay on demand or at a fixed or determinable future time a sum certain in money to or to the order of a specified person or bearer. The form of a promissory note is as follows:

August 1, 1930.
Three months after date I promise to pay to Mr. Arthur Smith or order the sum of One Hundred pounds with interest at 6% (Six per cent) for value received
£100.

(Signed) JOHN JONES.

In this note John Jones is called the maker and Arthur Smith the payee. The payee of the note can negotiate it, i.e. by endorsing it on the back with his signature he can transfer it to anybody he pleases, with or without consideration. It may be negotiated in the same way by the holder as often as he chooses. In this way the note can pass through any number of hands and the holder at the end of the 3 months has the right to present it for payment to John Jones.

If John Jones does not pay it, the holder can call upon any of the persons or all of them whose names are on the back of the note as endorsers to pay. Any of such endorsers who does pay can in turn call upon anyone whose name was upon the note before his own to pay

him until it gets back to John Jones, the maker. It is no defence to John Jones or any of the other people, it sund, that they received no consideration. If anybody in the whole series of transactions has given any value at all, either in money or money's worth, the note becomes one for valuable consideration in his hands, and also in the hands of anyone who takes it after him.

The value of a promissory note is that it is negotiable, i.e. the holder of it has a good title to the money quite independently of the title of anyone from whom he took it.

As between the original parties, i.e. the original maker and payee of the note, the maker may have a good defence on the ground either that there was no consideration given for the note or that it was obtained from him by fraud or for some illegal consideration. But if the note gets into the hands of someone who is a holder in due course, i.e. a holder who received the note after consideration has been given for it by somebody and who takes it without receiving notice of any fraud or illegality at its inception, the holder can sue upon it.

If in the note set out John Jones received no value from Arthur Smith, that is a good defence of John Jones if Arthur Smith sues him upon it. But if Arthur Smith sells the note to William Brown for £5, William Brown can sue John Jones for the £100. He can, of course, also sue Arthur Smith. Again, suppose John Jones was induced to sign the note by some fraud on the part of Arthur Smith, John Jones can set this up as a defence against Arthur Smith, but if Arthur Smith sells the note to William Brown, who had no notice of fraud, then John Jones must pay William Brown if he is asked.

A note is only fully negotiable so long as it is current, i.e. until it becomes overdue. The note is overdue after the time when it is stated on the face of it to be payable. Thus, the note above is overdue after the expiration of the three months. It can still be transferred even after that date, but anyone who takes the transfer takes the risk of the note having been bad at its inception. In other words, it becomes like an ordinary contract or debt, and the maker may set up any defence or fraud against any holder, and it will then lie upon the holder who took the note after it was overdue to show affirmatively that he had no knowledge of such fraud. See Debt; I.O.U.

PROPAGATION: Of Plants. The chief methods of propagating plants are by seeds; cuttings; division; layering; bulbils; offsets; grafting; budding; marching; leaves, as in gloxinia; runners, as in strawberries; stem-rooting, as in the castor-oil plant; eyes, as in vines; and by pipings. Most of these are dealt with under separate headings.

Aids to propagation are pots, pans, and boxes, a fine sieve, some panes of glass, 2 or 3 cloches, a fine-rosed watering pot, a good syringe, a keen budding knife, and a few minor appliances, such as bast, clean crocks, etc. To these may be added a propagator and a garden frame. A propagator can be made from an ordinary box, with sheets of glass from old picture frames, or from a pot with charcoal and fibre, and

covered with glass. Suitable soil is required, and, generally, any good light soil opened with a little sand will suffice, but certain other combinations will often be called for, including rich loam, sandy peat well rubbed down, decayed leaf-mould, silver sand.

A few hints on preparation for sowing may be of value. Pots, boxes, or pans must be well crocked with clean potsherds, over which a thin layer of moss or fibre is placed. This is followed with compost to within $\frac{1}{2}$ in. of the top, the whole then being made moderately firm by pressure, and gently watered. Excess water should be allowed to drain well away, then the seeds are sown thinly and covered with soil put through a fine mesh sieve.

After sowing, seed receptacles should be covered with a sheet of glass to conserve moisture. Should the soil show signs of dryness, immerse the pot gently in tepid water and moisten the plunging material. It can be shaded from sunshine with sheets of brown paper when the first rough leaf is formed it should be removed to a naturally shady place until ready for transplanting, every precaution being taken to avoid damping off.

There are various kinds of cuttings. Shoot cuttings should always be taken with a heel or cut at the base of a joint, the lower pair of leaves being removed. Other types are root-cutting and leaf-cutting. Receptacles with soil should be prepared in the manner already devised, but instead of the fine top covering of soil, well-washed sand should be used. The cuttings are inserted with a dibber, and their bottoms must touch soil at the base of their holes. The soil is pressed firmly round them, and they are removed to a propagator.

Most hardy herbaceous perennials are easily increased by division, i.e. by lifting the clumps in autumn or spring, separating them into pieces and replanting the latter. Only the young outer pieces should be chosen. Border carnations, various shrubs and strawberries are propagated by layering in summer. The shoots or stems are slit and the slit portion is pegged into the soil and kept moist. Budding is practised in July-August, chiefly for the purpose of raising a stock of fruit trees and roses. Grafting is carried out in spring both out of doors and under glass. Raspberries, chrysanthemums, and some shrubs are propagated by suckers, i.e. shoots which grow through the soil from the parent rootstock. See Cuttings; Division; Grafting; Pricking-Out; Seed; Sowing.

PROPELLER SHAFT. This (also known as *cardan shaft*) is the driving shaft placed between the gear box and the back axle in a



Propagation: the various methods employed. 1. Budding. 2. Grafting. 3. Layering. 4. Multiple layering. 5. Stem rooting. 6. Rootlet of monkshood. 7. Propagation by eyes. 8. Rhizome of perennials. 9. Crinum offset. 10. Root propagation. 11. Hardwood cutting.

motor vehicle, and may be classified under two heads—open and enclosed. With the open type a universal joint is employed at each end, one of which is capable of longitudinal as well as universal movement. The reason for this is that the radius of the axle movement is governed either by the point of the spring anchorage to the frame or, where fitted, by the point of anchorage of the torque stay. The object of the torque stay is to relieve the springs of the twisting tendency of the axle, which is created by the driving and braking stresses.

Unless the centre of the universal joint next the gear box is the same distance from the axle as the other centres that govern the axle's movement (e.g. the spring or torque stay anchorage), the up and down movements of the axle will cause the length of the propeller shaft to alter slightly, and this sliding movement must be provided for. Therefore one of the universal joints is made to permit longitudinal movement. The open shaft is usually constructed of large diameter steel tubing, which affords rigidity and strength.

With the enclosed shaft, the difficulties of centres do not exist to the same extent, because the casing for the shaft is also a rigid part of the back axle, and acts as the torque stay with its forward end anchored close up to the gear box by a ball and socket joint.

Apart from the attention to lubrication which all universal joints require, there is one other point which may be mentioned in connexion with the propeller shaft, namely faulty alignment. This may be detected by a regular rhythmic whining noise when the car is running quietly. The trouble can be put right by any service garage, and is not an expensive job. See Brake; Motor Car.

PROPERTY TAX. This name is given to that part of the income tax which is derived from property. This is paid by the occupier of the house or premises, and if he has a landlord he is entitled to deduct the amount from the rent. See Income Tax.

PROTEIN: As a Food. In animal and vegetable tissues there are found complex organic compounds of carbon, hydrogen, nitrogen, oxygen, and sulphur, which are known as proteins. Food must contain a certain proportion of these nitrogenous substances, because they are absolutely necessary for the building and repair of the tissues. White of egg, serum albumin, fibrinogen, peptone haemoglobin, and casein are examples of proteins.

The patent food sold as protein food is used largely in vegetarian cookery, but may also be served as a breakfast or supper drink. To prepare this, put 3 tablespoonfuls of the food in a jug, mix it slowly with half pint of hot water, milk, cocoa, tea, or coffee. Grated nutmeg, cinnamon, or ginger flavouring may be added to taste. See Diet; Food; Vitamin.

PROTRACTOR: For Measuring. Used for measuring angles, the protractor is generally made in brass or plastic, the commonly used pattern having a base of 4 in. The method of using the protractor is here illustrated. The two ends A and B are placed on a line with the centre-point C exactly at the place where the required angle is to start from. If a mark is made at the point 60 as indicated at D and the point D joined to the centre point C, the angle made by the lines A C D contains 60°. In the same way an angle of 25° can be set off from the point E, and the angle contained by the lines F C B is 45°. Other

angles are 55° at G, 77° at H; the right angle is at K and an angle of 115° is contained by the lines L C A. See Drawing.

PROUD FLESH. The flabby, unhealthy tissue that sometimes projects from the edges of a wound or ulcer is popularly termed proud flesh. It may result from an excessive use of poultices and ointments. The remedy is the application by the surgeon of an astringent, such as a solution of sulphate of copper or nitrate of silver.

PROVENCE ROSE. One of the oldest garden roses, this is commonly called the cabbage rose because of the shape of the blooms, which lack the graceful contour which is characteristic of many modern varieties. The Provence rose, which was derived from *Rosa centifolia*, bears rose-pink fragrant blooms. It forms a fair-sized bush, flowers in summer only, and should be pruned in March by cutting out old worn-out branches and shortening the previous year's shoots slightly.

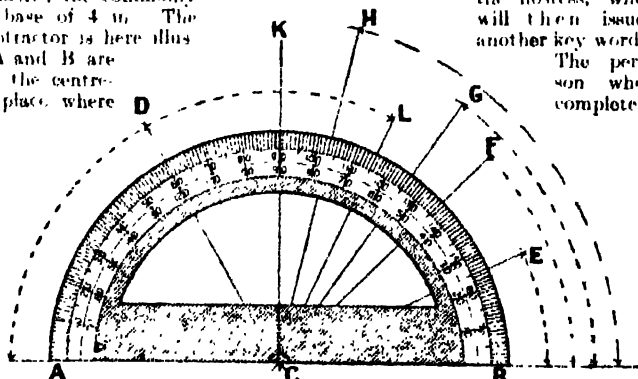
PROVERBS: The Game. There are various games of this name. One of the best known is as follows: One person is sent out of the room. The others select some proverb which contains as nearly as possible the same number of words as there are people present. The words are then given out in order and the person outside is summoned in. He proceeds to ask a question of each player in turn, and the answer must contain the word of the proverb which has been given to that player. When all have been questioned the newcomer must guess the proverb.

Should there be insufficient words to go round, the people for whom there is no word must keep silence. If there are more words than players some of the players must be responsible for two. Obviously the proverb chosen must have as few distinctive words as possible if it is to present difficulties in guessing. "It is never too late to mend" is an example of an easy one to disguise, while "a rolling stone gathers no moss" is remarkably difficult. There are few ordinary questions an answer to which would naturally contain "rolling" or "moss"; the latter word alone would identify it.

A Variant. In another form of the game a list is made of as many proverbs as are considered necessary, the number being regulated by the number of guests expected. Each is then written out in separate words on separate pieces of paper. The key word of each is kept out, and the others, having been well shuffled, are pinned up in different places all over the house. This must be done before the guests arrive. It is advisable to keep the original list as a reference in case of questions.

The guests are each given a key word and are set to complete the proverb which it suggests to them. They must be shown which rooms may be included in the search, and must all start at the same moment. Each proverb when completed must be brought to

the hostess, who will then issue another key word. The person who completes



Protractor. Instrument used by the draughtsman for measuring angles

the largest number in the time given receives a prize.

This is an excellent game for an afternoon or evening party and the less formal type of at home. At least three proverbs should be allowed for each player, but the larger the number the more difficult they are to find and the keener will be the interest. See Children's Party.

PRUNE. The dried fruit of some varieties of plum is known as prune. Prunes form a health-giving addition to the diet, because of their content of carbohydrate, and also because they increase the palatability of cornflour and other starchy dishes. They have a mild laxative effect, and are eaten regularly with advantage by those who have a marked tendency to constipation.

Before stewing, wash the fruit thoroughly and soak it for 12 hours or more in a covered basin containing sugar and water. To 1 lb. prunes, ½ lb. or a little more sugar and enough cold water to cover them should be allowed. After soaking, put the fruit and syrup into a pan with a little lemon rind and juice. Stew these slowly until the prunes are tender, and serve them with the syrup.

Prune Fritter. Cold stewed prunes may be used to make fritters. Take out the stones, and in their place put some blanched almonds. Then coat the prunes with frying batter and fry them to a golden brown colour in a pan of boiling fat. Serve the fritters sprinkled either with castor sugar and grated chocolate or with sugar alone.

Prune Mould. This sweet is made by washing ½ lb. prunes covering them with cold water, and letting them soak for 12 hours



Prune Mould, a jelly sweet which can be made richer by the accompaniment of thickly whisked cream

Dissolve a ½ pint packet of lemon jelly in hot water, and pour about 2 tablespoonfuls of it into the bottom of a mould previously rinsed with cold water. Put the prunes, together with their liquor, into a saucepan, add 3 dessertspoonfuls sugar, 1 oz. candied peel cut into small pieces, and the grated rind of a lemon, and cook all gently until the fruit is tender. Take out the prunes and stone them, boil up the syrup for a few minutes until it thickens, and then set it aside to cool.

In ½ gill of it dissolve ½ oz. leaf gelatine, put the prunes back into the remainder of the syrup, and add the strained juice of a lemon, ½ oz. blanched almonds cut up roughly, ½ gill sherry, and the rest of the jelly. Strain in the gelatine, stir all together until they thicken, then colour the mixture with a few drops of cochineal and pour it into the mould. When it has set, turn it on to a dish, and with an icing bag force round its base 1 gill thickly whisked cream, sweetened and flavoured to taste. Sprinkle the cream with some pistachio nuts which have been blanched and chopped.

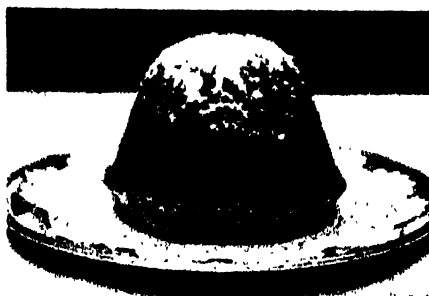
A prune and rice mould can be made by soaking ½ lb. prunes as already described, and then putting them into a saucepan with the water in which they have been soaking. Add also a dessertspoonful Demerara sugar and 1 oz. candied peel cut into small pieces, and cook them until the fruit is soft. Then take out the prunes, stone them, and boil the syrup rapidly for about 5 min. The candied peel may be left in the syrup or strained out. Wash 3 oz. rice, put it in a saucepan with

1½ pints milk and 2 dessertspoonfuls sugar, and cook it slowly until it has absorbed the milk. Then stir the prunes into it, turn the mixture into a wet mould, and leave it to set.

Prune Pie. A pie can be made from prunes by preparing 1 lb. as already described, and putting them in a deep pie-dish. Cover with a lid of short pastry, and bake in a hot oven for half an hour (6 oz. will be required).

Prune Pudding. To make a pudding with prunes they should be stewed and then rubbed with a little of the syrup through a fine sieve. Mix together ½ lb. flour, the same quantity of breadcrumbs, a little less than ½ lb. sugar, 4 oz. suet, a teaspoonful baking-powder, and a little salt. Form a well in the centre, and into this put a well-beaten egg, a breakfastcupful of the fruit pulp, and a little milk.

Mix these gradually, adding more milk if necessary, and then turn the whole into a greased basin. Cover it with a piece of greased paper, and steam the pudding for



Prune Pudding, a wholesome steamed pudding which might be served with hot custard

about 3 hours. Hot custard makes a good accompaniment. See Batter; Custard; Pastry.

PRUNELLA. This dwarf growing perennial, commonly known as self heal, is suitable for carpeting bare ground. The best form, Webbiana, has crimson-purple flowers.

PRUNING OF TREES AND BUSHES

Directions for an Essential Gardening Operation

The gardening reader may be referred to such headings as Apples; Gooseberry; Pear; Plum; Rose. See also Disbudding; Grafting; Kitchen Garden etc.

Pruning is the process of cutting trees and bushes in such ways and at such times as will help their productive qualities. Pruning is chiefly employed for trees and bushes that bear fruit and flowers.

Dealing with fruit trees, the objects of pruning are several. One is to form the tree, as trees are grown to certain forms for certain reasons, and these forms are secured by pruning. Another is to secure for all parts of the tree their due share of air and sunlight, so that they will perform their functions properly. Pruning is also necessary to induce fruiting and to improve the quality and quantity of the fruit, to facilitate cultural functions, such as tillage, spraying, and finally gathering, and to remove dead and diseased fruit.

Knife and Other Tools. The pruner needs several tools. The first is a good knife, which he should keep thoroughly sharp, particularly towards the tip of the blade. The reason for this is that long, slung cuts, finished well through to the tip, are the safest and best. Such cuts can be drawn boldly on to the thumb with the keenest of edges on the knife without the slightest risk of injury, whereas short, jerky cuts are unsafe. The knife is the best tool for use on small trees, but for larger trees scutons or pruning shears may be used, especially if the pruner is working on a ladder, because he can steady and cut the shoot with one motion. For heavy pruning a saw is necessary. The best is a tiny one with a blade not more than 5 in. long and an inch wide,

with small, fairly wide teeth. A pruning hook is useful for cutting high branches.

Saw cuts and large wounds should be trimmed to smoothness with the knife and sealed over with white lead, oil paint, or carpenter's knotting.

Two Groups of Trees. To enable pruning to be done correctly some knowledge of the way in which trees and shrubs bear their flowers or fruits is essential. Fruit trees and bushes fall naturally into two groups so far as their pruning is concerned, those of one type produce fruits chiefly on spurs—short, sturdy shoots which bear blossom buds, those of the other type yield the best fruits on shoots or branches of the previous year's growth. The fruits of the spur fruiting type are apple, pear, plum, sweet cherry, apricot, gooseberry, red and white currant and vine.

Briefly, the way to prune the fruit trees is to shorten the side shoots of the current season's growth in July or early August, and to cut them back still further in winter. At the latter season weakly and crowded branches must also be cut out. Plum, gooseberry and apricot are most fruitful under a modified form of this treatment, in the management of apricot and plum trees care should be taken to preserve promising young shoots and to cut out parts of old branches to make room for them. The pruning of gooseberry bushes is done principally by thinning out the branches to such an extent that the hand can be passed between them, though the side shoots may be pruned in the orthodox way. During the summer vine shoots must be pruned; if this is not done it will become overcrowded and weakened.

Fruit trees which bear chiefly on the branches of the previous year's growth are peach, nectarine, black currant, raspberry, loganberry, blackberry, and other allied berried fruits,

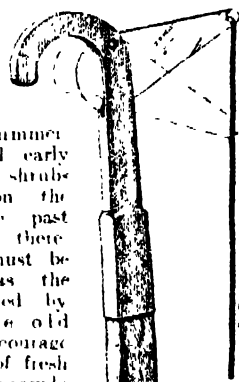
and the morello cherry. They are pruned as soon as the fruits are gathered by cutting out old branches or parts of them and preserving the shoots of the current year's growth to replace them. In dealing with peach and nectarine trees disbudding, that is the removal of superfluous young shoots while they are small, is necessary.

The Lorette System. A practice which is gaining favour among fruit growers is the Lorette system of pruning, so called because it was introduced by M. Lorette, a French expert. It differs from the orthodox summer and winter pruning of side shoots as practised by British growers, for the non-blossoming shoots are cut hard back in spring, leaving only the very small leaves at the base. In June the trees are again examined and all shoots of the approximate thickness of a lead pencil are shortened to about half an inch. This system is based on the discovery that if the buds at the extreme base of the shoots (buds which remain dormant under the orthodox pruning) are forced into growth by hard pruning they will form fruit buds earlier than those higher up the shoot. Similar pruning is carried out periodically until the end of the summer, and no pruning is done in the winter months.

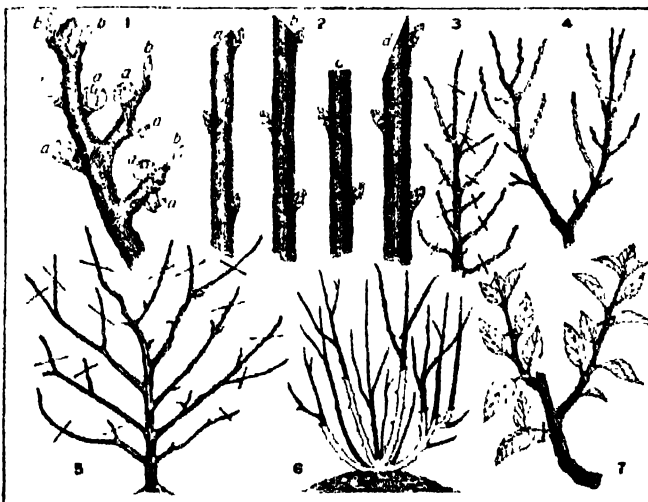
Ornamental Trees and Shrubs. These are conveniently classified in two groups in respect of pruning. In the first group are those kinds which bloom in spring and early summer; in the second group those which flower in late summer.

Many spring and early summer flowering shrubs bloom chiefly on the branches of the past year's growth, therefore pruning must be done as soon as the flowers have faded by shortening the old branches to encourage the development of fresh ones which will provide blossom the following year. Among them are the winter jasmine, golden bell shrub (forsythia) flowering currant, mock orange (philadelphus), weigela, lilac, dentzia and the spring blooming sparacae.

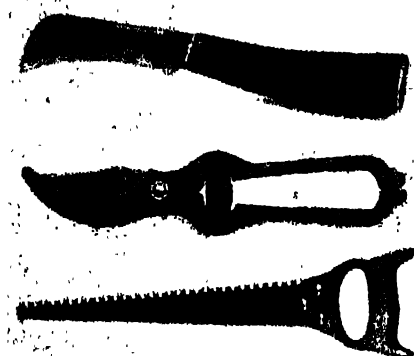
Shrubs which flower in late summer should be pruned in spring, because it is the new shoots



Pruning Hook, a device for cutting high branches



Pruning. 1. Comparison of fruit (a) and wood (b) buds. 2. Pruning cuts: a, correct; b, incorrect: snag left above eye. c, altogether wrong; d, cut too deep. 3 and 4. Different pruning for red (3) and black (4) currants. 5. Principle of pruning bush apple. 6. Pruning a rose bush: black parts to be cut away. 7. Pruning side shoot: to encourage fruit spurs.



Pruning: some of the necessary tools. Top, strong folding knife for the amateur gardener. Centre, pruning shears. Bottom, pruning saw, which has a row of teeth on each edge.

—those which have still to develop - which will yield the flowers. Familiar kinds which need this treatment are the rose, mauve buddleia, all varieties of Clematis of the Jackman type, *hydrangea paniculata* (not the common *hydrangea hortensis*), *hypericum* or St. John's-wort, late summer spiraeeas and hardy fuchsia.

There is still another type of ornamental tree or shrub—that which needs no regular or systematic pruning. They must be looked over occasionally for the purpose of thinning out crowded branches or shortening straggling ones which spoil the symmetry of the bush. These include flowering cherry, crab and plum, magnolia, rhododendron, azalea, viburnum or guelder rose, orange ball tree (*Buddlia globosa*), hawthorn and laburnum.

PRUNUS. This is the botanical name of one of the most important groups of hardy flowering and fruiting trees. It includes the almond, peach, nectarine, damson, apricot and plum. The common and Portugal laurels are also classed by the botanist as *Prunus*.

PRUSSIC ACID. Hydrocyanic or prussic acid is found in oil of bitter almonds, peach kernels, apple pips, cherry laurel leaves, and other vegetable products. When separated or prepared it occurs as a colourless liquid with a characteristic odour. Potassium and sodium cyanide are used in the extraction of gold from ores and in photography.

Prussic acid and the cyanides are extremely poisonous. In poisoning by prussic acid there is rapid unconsciousness, but if there be time an emetic of mustard and water should be given. An attempt should be made to rouse the patient by dashing cold water on the face and chest, or cold and hot water alternately. Ammonia-smelling salts should be held to the nose, and warmth promoted by hot flannels, hot-water bottles, and chafing the limbs. If breathing fails, artificial respiration should be at once begun. Stimulants should be given when swallow is possible. See Artificial Respiration; Poisoning.

PSITTACOSIS. Disease of parrots, and some other birds. It is due to a virus, and may be communicated to man. After a serious outbreak of the disease in 1929, the import of parrots and birds ceased into Great Britain was forbidden until 1952.

PSORIASIS. The skin disease known as psoriasis is characterized by flurish, dry patches of varying size covered with white or silvery-grey scales. The backs of the elbows, the fronts of the knees, and the scalp are the favourite sites, but the trunk and other portions of the body are not uncommonly involved as well. As a general rule the patient does not complain of symptoms beyond itching, and the patches can generally be made to disappear under treatment. Relapses are common, and the disease is subject to sudden increases in its rate of speed. If untreated this skin disease may last for many years.

The drugs used include arsenic, potassium iodide, thyroid extract, etc. The first step in local treatment is to scrub the patches with hot water and soft soap, or bathe them in warm olive oil. An ointment consisting of tar ointment, 2½ drams, and lanolin, enough to make 1 oz., is applied night and morning after the patches have been thoroughly cleared of scales. Another useful drug is resorcin, which may be used in an ointment composed of resorcin, 15 gr.; lard, 1 oz. Pron. So rias-is.

PSYCHO-ANALYSIS. A method of investigating the subconscious part of the mind, which has proved of great value in the treatment of certain forms of neurotic disorders, is known as psycho-analysis. The method was devised by the Viennese physician Prof. Sigmund Freud, and, with its applications, has led to the development of a school of thought which recognizes the influence of

the subconscious in a large number of mental processes.

Speaking broadly, the psycho analyst regards the mind as composed of two parts, the conscious, which appears to control our thoughts and actions, and the subconscious, which, without our being aware of it, does in fact exercise a powerful influence upon our motives and conduct. The subconscious becomes the repository of painful memories and primitive tendencies which are described as being suppressed or repressed, and often date from early childhood.

The exigencies of civilization and social life clearly demand a very considerable degree of inhibition of the primitive instincts and impulses. Abnormal tendencies present in infancy and childhood are by painful experience and education (in the broadest sense) gradually eliminated from, or prevented from ever entering, the conscious part of the mind as normal growth and development proceed.

It is clear that very often the impulses to action of the conscious and subconscious must be in direct opposition to each other. In the normal individual these two parts are so adjusted that no conflict of which he is aware arises. In the hysterical individual, however, the adjustment between the two parts of the mind has not been satisfactorily effected, and the result is the appearance of the various symptoms which are characteristic of hysteria.

The ultimate object of treatment by psycho-analysis is to effect an adjustment between the conscious and subconscious, and thus bring about a resolution of the conflict which is responsible for the symptoms. For this purpose, by means of a special technique, the patient's immediate and free associations with events in his life which have had an emotional effect, slips of the tongue, errors in writing, etc., are obtained, and furnish a clue to the underlying cause of the trouble. In particular, dreams provide material of great value for investigating the subconscious.

Little by little under this treatment the patient comes to understand the warring mental processes which are going on within him, the symptoms gradually disappear, and in favourable cases a complete cure can be effected. The patient who seeks relief by this method is advised to place himself only in the hands of a skilled physician.

PTARMIGAN. A small species of grouse found in mountainous regions, the ptarmigan is also known as the white grouse, because of the colour of its plumage in winter. It needs to be well hung, and is cooked in the same way as ordinary grouse. Ptarmigan is best eaten young, otherwise it may be found to have rather a bitter flavour. These birds make an excellent salmi and game pie. See Game Pies; Ptarmigan.

PTERIS: The Fern. The bracken (*Pteris aquilina*) is the commonest of all British ferns and a familiar feature of the landscape in many parts of Great Britain, especially in woodland districts. It is scarcely suitable for planting in gardens of moderate extent. Bracken fronds provide useful material in winter for the protection of roses and tender shrubs. Several of the pteris ferns are admirable plants for the slightly heated greenhouse and room window, they are easily grown in pots in a compost of loam, leaf-mould, and sand. *Tromula*, *serculata*, *serrulata cristata*, *cristica* and *cristica albo-lineata* are some of the most attractive. They need a good deal of water in summer but much less in winter. They are propagated by sowing spores in pots of soil covered with glass in the greenhouse.

PTOMAIN POISONING. By their action on animal and vegetable matter, bacteria may produce alkaloidal substances,

called ptomaines, some of which are poisonous. It would appear, however, that in the great majority of cases of food poisoning this is not due to ptomaines, or to the products of putrefactive organisms generally, but to disease-producing bacteria and their toxins. A poisonous ptomaine may occur in cheese, pork, ice cream, and other commodities.

Almost any kind of food may give rise to poisoning, but some kinds are more dangerous than others, and should be eaten with caution in hot weather. These are veal and pork pies made from stale meat or kept some time after cooking, cold veal, pork, and badly cured ham, sausages, mussels and other shell fish, mackerel, crab, canned fish, and contaminated ice cream. To these may be added goose and venison kept too long.

Both the living microbes and the chemical substances they produce in the food may be poisonous. The microbes are killed by thorough cooking, but the poisonous substances within them may not be affected. Consequently cooking is not always a protection.

It should be remembered that cooked food is as liable to infection by microbes as raw food. Meat may be quite wholesome when first used and then, when put away in a dirty or ill-ventilated larder, it may become contaminated. This very often occurs, poisoning being frequently caused by cold or reheated meat that has been kept some time after cooking.

One of the great dangers arises from the fact that the meat or fish may contain a fatal dose of poison without having any appearance of odour or decay.

The symptoms may set in soon after a meal or be delayed for twelve hours, or even longer. The patient suffers from violent pains in the abdomen, with nausea, vomiting, and purging. His pulse beats quickly, he has a severe headache, is very weak, and in a state of extreme nervous depression. There may be cramp in the calves of the legs, sleepiness, dizziness, dimness of sight, difficulty in breathing, and finally collapse and death.

At the outset give an emetic of a tablespoonful of mustard in ½ pint of warm water. Follow this with a quickly acting purge, such as a large dose of salts, 1 oz. of castor oil, or 5 gr. of calomel. For weakness give stimulants, and keep the patient warm with blankets and hot-water bottles. Any of the following stimulants may be used: whisky or brandy, in doses of 2 to 4 teaspoonfuls frequently repeated; sal volatile, a teaspoonful in a little warm water; or hot, strong tea. Pain may be relieved by hot poultices or flannels wrung out of hot water to the abdomen. When the patient recovers sufficiently to take food, it should consist at first of boiled milk only. See Food; Poisoning.

PUBERTY. The critical age when the sexual functions become active is usually referred to as puberty. In Great Britain it occurs in girls between the ages of thirteen and fifteen, but may be a year or two earlier or later in exceptional instances. In boys the average age of puberty is between fourteen and sixteen.

Profound changes take place at this period, and parents should exercise great care and watchfulness over their children's health, bodily, mental, and moral. The physical and mental change is very sudden, and there is a great expenditure of energy on the quick development. It is not uncommon, therefore, to have signs of nervous disturbance and exhaustion showing themselves at this time. There is a great increase in glandular activity, and the effect of this on the skin glands is a reason for the onset of acne at puberty. The whole outlook of life becomes altered, the feeling of sexual difference asserts itself, emotion deepens, and the boy or girl may

become very impressionable, self-conscious, and perhaps shy and awkward in manner.

Plenty of nourishing food and outdoor exercise and abundant time for sleep are essential. The following shows the minimum of sleep required as a rule:

13 years old	10½ hours
15 " " " " " " " "	10 "
17 " " " " " " " "	9 "

Do not let a boy or girl be overworked in body or mind. If school-work seems too much it should be cut down. With regard particularly to girls, their management at the appearance of menstruation (q.v.) will influence their health for life.

PUDDING. Puddings can be either sweet or meat, and boiled, steamed, or baked, according to their ingredients. Those made of suet are boiled or steamed, being wrapped in a scalded and floured cloth, or turned into a greased basin and covered with a cloth or a piece of greased paper. Batter and custard puddings, as well as those made with a covering of pastry, are baked in a deep dish. Ice puddings come into a different category, as they are made by a freezing process.

Pudding Cloth. The calico cloths in which boiled puddings are cooked should be sprinkled with flour before use. They need to be kept scrupulously clean, and after use any of the mixture adhering to the cloth should be scraped off, the cloth washed in hot water to which a little soda has been added, and, if necessary, boiled. Rinse it well to remove the soda, and dry the cloth in the open air. No soap should be used either in washing or boiling. Cloths used for tying over the tops of puddings cooked in basins are treated in the same way. See Apple, Batter, Beef Steak Pudding; Cherry, Chestnut, Chocolate, Christmas Pudding; Coconut, Dried Fruit, Gooseberry, Ice, Jam, Lemon, Macaroni, Marmalade, Pastry, Pineapple, etc.

PURPERAL FEVER. Quite shortly after labour a woman may become febrile for a few hours, from some slight cause, or she may become seriously ill from septic infection of the womb or other neighbouring part. The name puerperal fever is popularly given to this condition.

Symptoms of infection may appear a few hours after the birth of the child, but most frequently the first symptoms manifest themselves about the third day. Fever is usually the first sign to attract attention; it may be accompanied by a chill and headache. Puerperal fever is a notifiable disease and immediate medical treatment is required.

PUFF PASTRY. The most delicate of all baked pastries is puff pastry. It is made with equal quantities of butter (or margarine and lard) and flour, a little lemon juice, water, salt. The method of making puff pastry is given in the article on Pastry. Sometimes an egg is added to the other ingredients to enrich the colour of the pastry, which requires a steady but brisk oven. See Pastry.

PUG: The Dog. The pug is a quiet, clean, and affectionate dog. His strong attachment and faithfulness to his master or mistress, his docility and good behaviour, make him a very attractive home companion, especially when it is not desirable to spend so much time over the dog's toilet as is requisite for pets with long, silky coats. Short, thick, and rounded in body, with a smooth, short coat, the pug has well-developed hindquarters, straight, short legs, and a tightly curled tail. The head is rather large, with square, wrinkled face and a short black muzzle. The eyes are large and black; the small, silky ears hang close to the head. Pugs were formerly all fawn-coloured, with a black line down the middle of the back,



Pug. A favourite variety of short-haired toy dog. Mrs. Lake's champion, "Captain Nobbs."

Photo: Thor Fell

a black spot in the centre of the forehead and one on each cheek; the toenails were black. These points are no longer insisted upon. There is now an entirely black race, and the fawns vary from silver grey to apricot colour. The weight should be from 13 lb. to 17 lb. See Dog, Kennel.

PULLET. From the time when she emerges from chickenhood until she becomes an adult the female fowl is known as a pullet. In the past a fowl was considered a pullet from the day she was hatched until Jan. 1 in the year following. But with the advance of egg-laying properties, and the institution of egg-laying competitions in which the birds are entered as pullets, it has become customary to speak of the number of eggs a bird laid in her pullet year. To avoid confusion, a bird is con-

sidered a pullet until she has completed her first laying year, which is termed her pullet year, though strictly speaking she became a hen on the previous Jan. 1. For exhibition purposes the old definition remains, and a pullet becomes a hen on Jan. 1 following her birth. See Chicken, Fowl, etc.

Pullover. See Sweater.

PULMONARIA. These hardy herbaceous plants of the borage family are suitable for the rock garden or border. The flowers of most of them are blue on opening and change to rose colour as they fade, and the leaves have white markings. The common name is lungwort. The best sorts are angustifolia, 12 in., arvensis, 10 in., and rubra, 12 in., reddish. The flowers open in spring and early summer. Propagation is by dividing the plants in autumn. See Border, Rock Garden.

PUMICE. There are a number of uses for pumice. It is employed in the form of a powder in soaps and cleaning mixtures of many kinds, and is also present in a number of polishing compositions. Pumice is chiefly employed in the home for cleaning purposes. A small lump is rubbed on the fingers to remove stains and paint markings. The powder, wrapped in a linen or muslin bag, can be employed for rubbing down a painted surface, especially if worked with a little water to act as a lubricant. In addition pumice is employed as an ingredient in a certain kind of soap known as pumice soap.

Pumice stone is usually greyish white in colour, but can also be obtained in yellow, brown and black. It is especially effective in removing obstinate ink stains from the fingers, and is also used to produce a gloss on unpolished marble, and for rubbing down papier mâché articles before painting them. See Lubrication, Marble.

PUMPS FOR THE SUPPLY OF WATER

A Household Necessity in Country Districts

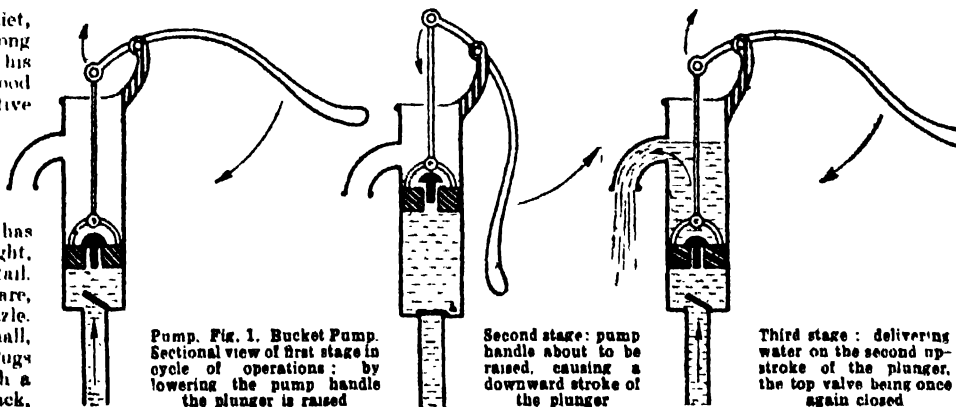
This article is one of those that deal with the important subject of the water supply. See that entry; also Frost; Pipe; Rainwater; Ram; Well.

In country districts, and also to some extent in towns, households are dependent for their supply of water, or at least for some part of it, upon a pump, which may be situated either inside or outside the dwelling. Such pumps are of two main kinds. The one more frequently seen is known as a reciprocating pump, but the other, the chain pump, is also used. There are three main kinds of reciprocating pumps: bucket or lift pumps, piston or force pumps, and combined bucket and plunger pumps.

The principles of the bucket or lift pump are fairly simple. A bucket works in a barrel, being raised or lowered by the movement of a handle. When the bucket is first raised a partial vacuum is created in that part of the barrel that is below it, and water rushes in through the suction pipe which is beneath the

barrel, lifting the foot valve that divides the two. Then comes the down stroke caused by the upward movement of the handle, the water below the bucket being trapped by the closing of the foot valve. This, therefore, forces open a valve nearer the top of the barrel, or one in the bucket itself, and the water gets above the bucket. The bucket then rises again and carries with it the water above the upper valve, which is discharged through the mouth of the pump. Simultaneously more water is sucked into the barrel through the lower valve. The sequence is illustrated in Fig. 1. In Fig. 2 a typical lift pump is seen, the valves being shown separately. The latter may vary in type, but the working principle is as above described.

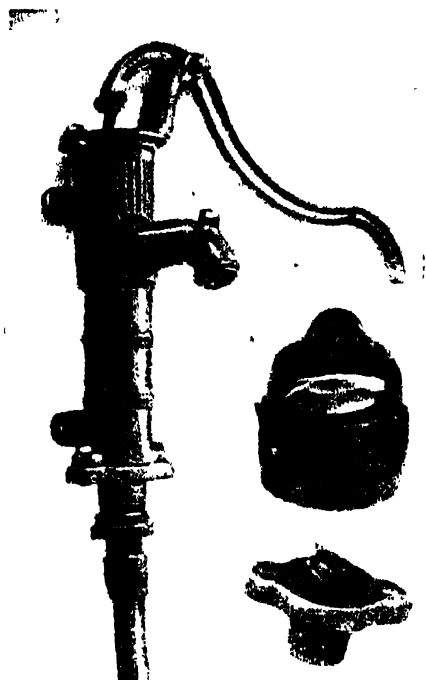
The lift pump is useful for raising water from a well to the surface, and is recommended



Pump. Fig. 1. Bucket Pump. Sectional view of first stage in cycle of operations: by lowering the pump handle the plunger is raised

Second stage: pump handle about to be raised, causing a downward stroke of the plunger

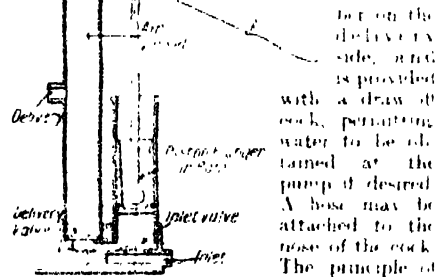
Third stage: delivering water on the second up-stroke of the plunger, the top valve being once again closed



Pump. Fig. 2. Bucket or lift pump with valves shown separately. A. plunger, showing mushroom valve in open position. B. flap valve at base of pump.

for suction lifts up to about 25 ft. Trouble associated with this pump is usually restricted to incorrect valve seating owing to the material used being perished or worn, or to a badly fitting plunger, also due to wear. New leathers can be had quite cheaply, so that it is not worth while to continue using defective ones. Where considerable pumping is required before water is drawn, indicative of faulty valves, the operation may be considerably quickened if a quantity of water is poured into the top of the pump before pumping is commenced.

Lift and Force Pumps. When, in addition to lifting water from a well, it is desired to force water into an elevated tank, a combined lift and force pump is used. The pattern illustrated in Fig. 4 has an air chamber on the delivery side, and is provided with a draw-off cock, permitting water to be obtained at the pump if desired. A hose may be attached to the nose of the cock. The principle of the force pump is shown in Fig. 3, which illustrates what is known as a ram type, used for working against considerable pressure.



Pump. Fig. 3. Mechanism of common type of force pump.

An excellent pattern of force pump is that known as a semi-rotary, illustrated in Fig. 5. The internal construction comprises a rocker or movable plate, which oscillates within a circular cast iron casing. The water enters at the bottom, is forced to the upper side of the rocker through a simple flat valve, and then through the upper chamber into the delivery pipe, other valves serving to check the return of the water.

This type of pump is very easy to work, and will lift water from a depth of 10 or 12 ft. without the need of a holding-up valve. It will lift from greater depths if such a valve is fitted to the suction pipe, but no pump will lift more than about 27 ft. It can force water to a great height, depending largely upon the energy with which the handle is operated and the amount of friction in the pipes.

Another good pump for domestic purposes quite inexpensive, is the diaphragm pump shown in Fig. 6, which at 60 strokes per min. will deliver 4½ gal. water per minute. With the addition of a foot valve and strainer it will lift from 25 ft. and force water to a vertical height of 50 ft. In this class of pump a flexible diaphragm of leather or rubber replaces the piston or plunger.

Chain Pumps. The chain pump (illustrated in Fig. 7) consists of an endless chain passing over a pulley which is driven by a crankshaft mounted in suitable bearings in a framework or casing situated over the well head. The lower end of the chain should reach well below the surface of the water, which is raised when the crank is turned. The water clings to the rising chain and is flung off into the casing by centrifugal force as the chain passes over the pulley.

The turn of the chain must be at least 2 ft. below the surface of the water in the well. The spout should deliver the water over a barrel or into a chute or pipe, whence it can flow to any desired point. The only attention necessary is an occasional cleaning of the chain and frequent lubrication of the crankshaft bearings. This type of pump is specially adapted for lifting thick fluids, such as liquid manure, sewage, etc. Normally it is arranged for a depth of 12 ft. below the spout, but can be made for any depth not exceeding 25 ft. At 40 revs. per minute a 2 in. pump will raise 650 gal. per hour with a depth below spout of 12 ft.

Deep Well Pumps. In these the working surface is at or near the normal water level. The suction pipe projects down into the water, and terminates in a foot valve with a strainer to exclude dirt and other foreign matter. The delivery pipe extends to the well head and thence to a cistern or elevated tank. The pump is actuated by a well rod made of wrought iron, or sometimes of wood, which is guided by rollers in metal brackets fixed to the well side, as in Fig. 8, or mounted on a central staging.

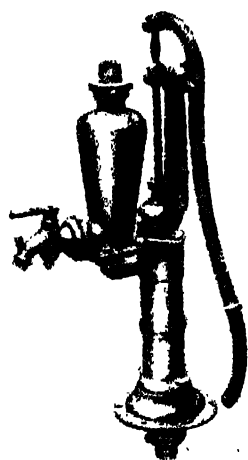


Fig. 4. Force pump with air chamber on delivery side. Fig. 5. Semi-rotary pump. Fig. 6. Diaphragm type of hand pump.

Figs. 4 & 5 courtesy of Joseph Lucas & Sons, Ltd.

The well-rod in the pump illustrated is worked by a wheel and crank type of pump motion.

A deep well pump of a simpler kind is shown in Fig. 9. A branch for the delivery pipe is provided 18 in. below ground level, and a draw-off cock 3 ft. above surface level. This type is adapted for wells up to 80 ft. deep, and for delivery to an elevated tank about 20 ft. above the well top. A smaller pump has the lever motion work attached to a plank (Fig. 10), the working barrel—not illustrated—being fixed below near water level and connected by iron rods with the motion.



Fig. 7. Endless chain pump for thick liquids.

Joseph Lucas & Sons, Ltd.

Power Pumps

As a rule a pump for the domestic supply is not required to work continuously, and therefore a hand operated apparatus which is employed for an hour or less per day usually suffices to fill the overhead cistern. However, we give brief particulars of a horizontal double acting power pump which can be driven by an oil engine.

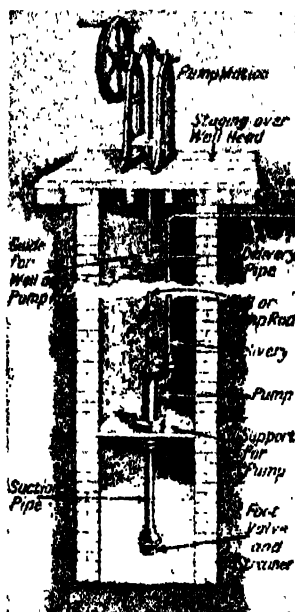
The Petter pump shown in Fig. 11 is coupled to a paraffin-petrol engine of the type illustrated on page 623, one rated at 1½ H.P. being used. Such an equipment will deliver about 350 gal. water per hour under a total head (including friction) of 150 ft. Suction must not exceed 25 ft. A foot valve and strainer are supplied with the pump.

A miniature pumping plant is sometimes employed to operate a small fountain in the garden. An underground rain-water tank can be arranged as the source of supply, the water from the fountain falling into an ornamental pool, whence the overflow drains back to the rain-water tank. A suitable plant might consist of a small centrifugal pump operated by means of a ¼ horse power electric motor.

Useful Data. A pump in theory should lift water from a depth of about 33 ft., but owing to various causes the average pump will not work with a vertical suction of more than 27 ft., reduced in the case of deep wells to about 20 ft.

In the case of some rotary and semi-rotary pumps the suction depth is much less. Factors governing the output of the reciprocating pump are the length of stroke and the inside diameter of the working barrel. Taking, for example, a single-acting pump with a 2 in.





Pump. Fig. 8. Section of a deep well force pump

as in the case of a spring or stream, and a fall can be arranged, it is often possible to use a run (p.v.) to raise the water.

PUMP : For the Motor Car. Pumps of various types are used in motor cars and motor cycles to inflate the tires and to circulate the oil in the engine and the water in the cooling system. The cylinder, piston, connecting rod and crank of any internal combustion engine form a pump; the piston will draw air into the cylinder via a valve on the down stroke and following this the air will be expelled on the up stroke.

This is the principle adopted in the case of most mechanical pumps such as are used in garages, but the ordinary hand-operated tire inflator carried on the car consists of a plunger on a rod working in a tubular cylinder. A third type of pump consists of one or more vanes working in a disk eccentrically disposed in a

circular chamber of a slightly larger diameter so that as the disk and the vanes revolve in the chamber the space between the vanes is constantly increasing and decreasing.

Oil Pumps. For circulating lubricant in an engine various applications of these principles are adopted. The plunger pump comprises a cam which is rotated by the engine and depresses a plunger (returned by a spring) oil being drawn in on the up stroke through a small ball valve and delivered on the down stroke through a similar valve. In the gear pump two small gear wheels are arranged within a casing which fits them fairly closely. One gear wheel is on the end of a shaft usually driven from the camshaft by skew gears, and the other wheel meshes with it. As the engine rotates, therefore, both the gear wheels turn also. A hole in the pump casing admits oil, which fills up the spaces between the teeth on the gear wheels and is carried round by the teeth to the other side of the casing. There

definite supply of oil only a little in excess of the actual amount required by the engine, as motor cycle engines—except on some of the most modern types—do not carry a supply of oil in a sump. Those motor cycle engines, however, which have been designed to carry oil in the pump employ methods resembling those used in a car engine.

Pumps for Water Circulation. Engines with water circulation on the thermosiphon system do not require a pump, but in large and medium-sized cars a centrifugal pump is used. Cool water from the bottom of the radiator flows into the centre of the casing, and the vanes of the rotating member carry the water round with them so that the water is caused to flow through the outlet pipe on the periphery of the casing to the cylinder jacket.

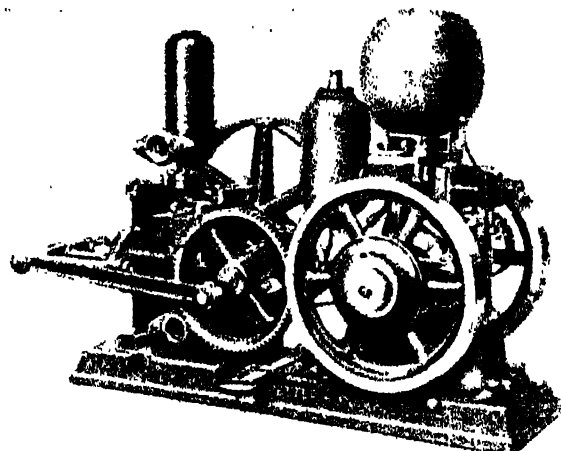
PUMPKIN. The pumpkin is a fruiting plant of the Cucurbita family, to which the gourd and the marrow also belong. It is not as largely grown in Great Britain as in N. America. Culture is the same as for marrows.

Pumpkins, like marrow, have their uses in cookery and can be made into soups, pies, and other dishes. They may also be served as a vegetable, when they should be prepared according to the directions given for cooking marrow. For soup-making, old pumpkins may be used, but for all other purposes they should be young and tender.

Pumpkin Pie. This pie is made by cooking some thin slices of pumpkin in boiling salted water, and when tender, rubbing them through a sieve. Measure out $\frac{1}{2}$ pint of the pulp, and to it add 3 well beaten eggs, $\frac{1}{2}$ pint milk, $\frac{1}{2}$ teaspoonfuls lemon juice, and sugar and spice to taste.

Mix these well, then turn them into a pie dish lined with short-crust pastry, and bake the pie for about 40 min. or until the pastry is golden brown in colour and the filling of a firm appearance. Serve it either hot or cold and sprinkled with castor sugar.

Pumpkin Pudding. To make this dish take a pumpkin, 2 oz. butter, $\frac{1}{2}$ pint milk, 2 or 3 eggs,



Pump. Fig. 11. Self-contained power pump driven by a 1 1/2 B.H.P. paraffin-petrol engine (courtesy of J. J. & S. Ltd.)

a pipe is provided along which it is forced at considerable pressure.

In the vane pump the shaft is eccentric to a circular casing. In a slot in the end of the shaft there slides a vane consisting of two flat pieces of metal with small springs between them. As the shaft rotates it forces the vane to turn within the casing, and accordingly the spaces between the shaft, vane, and casing alternately increase and decrease in size. A hole admits oil to the space which is increasing in size, and a pipe conducts oil from the space that is decreasing in size.

In most cars the oil pump is attached inside the crankcase, projecting downwards into the sump. The pump is then submerged in oil, and there is no chance of its failing to begin work as soon as the engine is started. When the pump is attached to the outside of the crankcase above the oil level it is usual to arrange the suction and delivery pipes so that when the engine stops the pump remains full of oil and is ready to start again. If a pump fails to work it may require priming, i.e. filling with oil.

On motor cycle engines similar principles are employed, but the oil-circulating pumps are usually run at a slower speed and are smaller. They are called upon to deliver a

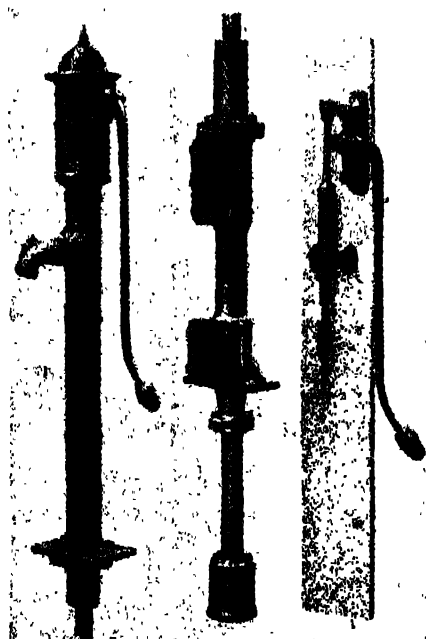
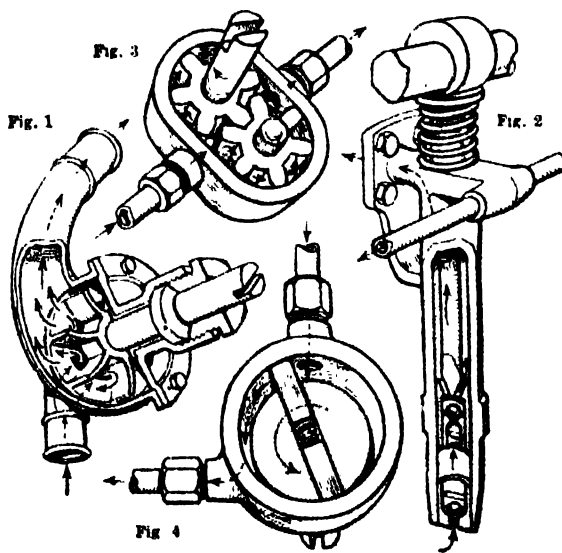


Fig. 9. Deep well pump, showing standard (left) and working barrel. Fig. 10. Smaller pump with lever motion attached to a plank. (Courtesy of Joseph Keane & Sons, Ltd.)



Pump for motor vehicles. Fig. 1. Centrifugal pump for circulating cooling water. Fig. 2. Plunger oil pump, operated by a cam. Fig. 3. Gear-wheel oil pump. Fig. 4. Eccentric vane type of oil pump. (Courtesy of The Autocore)

3 oz. moist sugar, $\frac{1}{2}$ teaspoonful powdered mace and a little grated nutmeg. Peel the pumpkin, remove the seeds, and steam or boil it until it is soft. Drain the pulp well, pass it through a sieve and measure it. One pint is required for the quantities mentioned; if more or less is used they must be varied accordingly.

Beat in the butter and spices; add the sugar and the milk, which should be made hot, beat up the yolks of the eggs and stir them in. Mix these all together, put them into a greased pie dish and bake the mixture in a moderate oven for an hour or until it is firm when touched. Whip the whites of the eggs to a stiff meringue, sweeten this to taste, flavour it with vanilla and pour it over the pudding, which should then be put back in the oven to get brown and set. It can be served either hot or cold. See Gourd, Mallow; Pastry.

PUNCH: The Tool. In the domestic sense a punch may be considered as any small wood or metal bar used for intervention between the hammer and the object to be smitten. The nail punch is a piece of mild-steel bar, either hollow or flat at the small end, and slightly rounded at the upper end. This is applied to the head of the nail, and the upper end is struck with the hammer to drive the head of the nail below the surface of the wood, or in order to prevent the wood being bruised.

Punches of various kinds are used for the perforation of leather. The wad or saddler's punch has a hollow, tube-like cutting end, with the hollow earned upwards and increased in diameter at its mouth. A smart blow with a hammer drives the punch through the material, leaving a clean, round hole. The part cut out is driven up into the hollow portion of the punch, such as doing cuts gradually forcing the disks out at the mouth. Other small, hollow punches are used for making round holes in leather. A hand-tool can be held with several punches of various sizes, and is used like a pair of pliers. Matting punches are made of steel, and are used by wood and metal workers for working up a diaper pattern. One end is shaped to produce the pattern, the other slightly rounded off. Soft punches are used by metal workers for many purposes.

A centre punch is for making an indentation on a metal surface (e.g. when starting to drill a hole). A similarly shaped punch with a sharp point is used for putting holes in corrugated iron. A bell centre punch has a conical shroud surrounding the point and is used for centring the ends of cylindrical rods. Spring-actuated punches are made which need only a gentle pressure to operate.

the marking point. A spacing punch has an additional or guide point which can be set at varying distances from the marking point.

Nail punches are employed for punching names or monograms. Buttonhole punches are used by dress-makers and tailors for cutting cloth. Eyelet punches are used for closing eyelets on sails and the like. Pinking

punches are about 1 in. in diameter and are employed for cutting soft material with a serrated edge. Automatic, mechanically actuated punches are made for cutting cardboard and paper for filing purposes. See Leather Work; Nail; Repoussé Work.

PUNCH: The Liquor. Five ingredients, lemon, sugar, spices, spirits, and water, are usually employed in brewing a bowl of punch, which was originally an Indian drink.

In making punch the juice of several lemons, together with one lemon cut into slices, is put with sugar into boiling water, allowed to stand for half an hour then strained into the bowl, and the spirits added, rum, brandy, gin, or whisky, with some grated nutmeg. The recipes vary, the quantities of each ingredient required being more or less a matter of taste, the proportion of water to spirits may be 2 to 1, or less. Rum and brandy may be mixed; sometimes milk takes the place of water, or champagne is used instead of spirits. Egg punch is made by adding 4 eggs to each pint of whisky, brandy, and rum in equal proportions.

Punch Jelly. Rum, sherry, and kirsch are used to flavour this jelly. Put the thinly peeled rind of 2 lemons into a pan with $\frac{1}{2}$ lb. loaf sugar and 1 pint water; boil the whole to a syrup, and then add $\frac{1}{4}$ oz. leaf gelatine, the strained juice of the lemons, a wineglassful each of rum, sherry, and kirsch, and an inch stick of cinnamon. Let the gelatine melt slowly, then boil up the whole and add a crushed eggshell, together with the stiffly whisked white of an egg. Whisk the contents of the pan over a fire till they boil up, let them settle for a few minutes, and then strain them through a cloth until they are clear. Pour the jelly into a mould to set, and serve it in small glasses, with a teaspoonful of whipped, sweetened cream on top of each, decorated with half a glacé cherry and strips of angelica. See Milk Punch; Rum.

Punch Bowl. Very capacious punch bowls were at one time a recognized article of household equipment. To-day when one is possessed of it is sometimes used on New Year's Eve and other special occasions when punch is brewed. The bowls were usually of polished oak or other wood, plain or with silver mountings. The bowls were also made of silver, and some fine pieces date from the latter part of the 17th century, when they were introduced into England. A few existing specimens are of Sheffield plate, but this metal was not much used for them. They are sometimes provided with a ladle, made of whalebone or wood, in the bowl of which a coin was inserted. The monteith, sometimes classed as a punch bowl, differs from the latter in that it is notched at the rim so that the glasses may hang by the foot down into the bowl. The rim could be removed when the glasses were required for use.

Porcelain was employed in making lighter and more delicate forms of punch bowl, and decorated vessels of this kind are still made in Japan for ornamental purposes, and form an article of export. There are some annual customs and ceremonies at which a punch bowl filled with spiced ale is passed round.

PUNCTURE: How to Mend. When a leakage occurs in a cycle or motor tire, it is well to make sure the valve is not at fault. A glass of water held up to the valve will reveal a leakage by the presence of air bubbles. If the valve passes the test, take out the inner

tube, attach the valve, and pump up again. If the leak is a bad one, it will be sufficient to run the hands over the tube to detect the stream of escaping air. If the leak is a small one, the inflated tube should be immersed by 6 to 8 in. lengths in a bucket of water. Air bubbles will locate the puncture, and its position can be marked with an indelible pencil.

The patch had better be a prepared one, as sold with the puncture outfit. The surface of the tube near the puncture should be thoroughly cleaned with glass paper and a little petrol. The solution should be rubbed well into the surface of the tube on and round the place of puncture and on the patch until the two surfaces are tacky. The prepared

surface of the patch is protected by linen, and should not be touched with the fingers after the linen has been removed. The patch should be held firmly on to the tube until it is dry. In dealing with a large patch care must be taken that air is not imprisoned between tube surface and



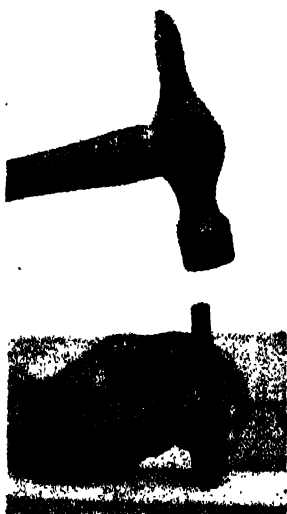
Punch Bowls in antique silver. 1 Engraved bowl originally used as a monteith; period of James II. 2 Queen Anne punch bowl with embossed shield, mask handles and castellated loose rim; maker Richard Green, 1711

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the patch. This can be avoided by first pressing the middle portion into contact and then slowly working down the remainder.

Plenty of time should be given to let the patch dry thoroughly, and it should be dusted with french chalk to dry the sticky edges. If the inner tube has punctured on the rim side and not on the tread side, the wheel rim should be carefully examined while the patch is drying. The puncture may have been caused by the nipping of the tube between the edge of the cover and the rim, or by chafing on the spoke heads, which may not have been filed down properly, or the tape which protects the tube from direct contact with the heads has slipped or worn through. Perhaps the tube is not the correct size for the cover, or it has not been properly inflated. The cover may be a bad fit on the rim, or the rubber may have perished.

A common cause of punctures is nipping of the inner tube, owing to lack of care in replacing it. The deflated tube should be placed inside the cover on the wheel, the cover having one free edge. Fit the valve and pump up the tube just sufficient to make it round. The cover can then be levered on the rim with little danger of the tube being punctured. In any case, when the cover has been finally placed on, the rim should be examined



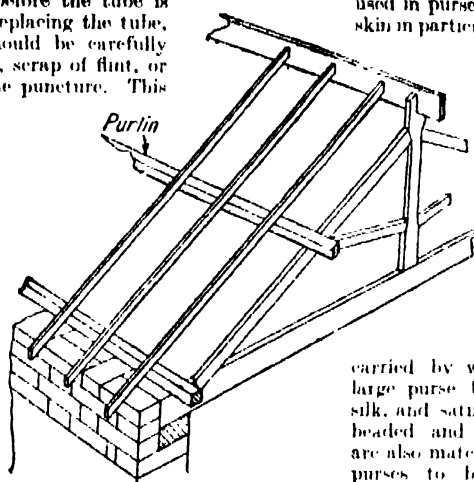
Punch. Using a nail punch to drive the nail head below the surface of the wood

all round, to make sure, before the tube is finally blown up. Before replacing the tube, the inside of the cover should be carefully examined to locate the nail, scrap of flint, or other object that caused the puncture. This may be hardly visible, but unless removed will cause trouble again. Any considerable gash in the cover should be sealed up with one of the patent compounds sold for the purpose. See Motor Car; Motor Cycle; Tire; Valve.

PURCHASE TAX. Tax introduced in Great Britain in the 1939-45 war, and first levied on October 21, 1940. The tax was imposed on retail sales of consumer goods, except food and drink, and was graded according to the necessity of the article taxed; on some articles the tax reached 100 per cent of the article's retail price. Some goods, chiefly clothing, which normally were liable to purchase tax were exempt provided that: their manufacture was standardised from specified raw materials; a minimum of material was used in their manufacture; and that their retail price did not exceed a certain amount. These were called utility goods.

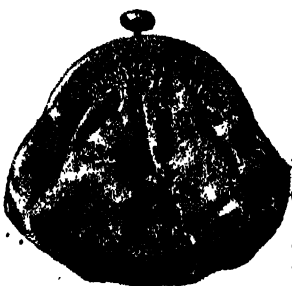
Purchase tax was continued after the 1939-45 war, but in 1952 the arrangement under which goods were free of tax because they came within a utility specification was ended. Instead, the D scheme was introduced, whereby articles below a specified price level (which is liable to variation) became exempt from the tax, more expensive articles being taxed on the excess of their price over the D level, so fixed that about one half of consumer goods avoid tax.

Under the D scheme, the basic rates of purchase tax of 6 2/3 per cent, and 3 1/3 per cent, on garments, shoes, cloth, and household textiles were reduced by a quarter to 50 per cent, and 25 per cent. Some of the higher quality goods which, under the utility scheme,



Purlin. Showing the situation of this piece of roofing timber

were free of tax became liable to a small tax. As a result of the D scheme, shopkeepers stopped using the word "utility" to designate goods free of purchase tax, and substituted by general consent the term "tax free."



Purse. Brocade purse, the silk being gathered to an ivory top

Purgative. See Aperient; Cathartic.

PURLIN : Of a Roof. The purlin is the horizontal member of the roof that supports the common rafters between the ridge and the wall plate. The purlin is supported by the principal rafters, which are the top members of the truss of the roof; the ends are supported by the walls at the end of the building, or, in a hipped roof, they are framed to the hip timbers. See House; Loft; Roof.

PURPLE CONE FLOWER. This is the common name of a hardy herbaceous perennial, *Echinacea purpurea*, which grows 2-3 ft. high, and bears large reddish-purple flowers with raised cone-like centre. Propagation is by division in autumn.

PURSE. Leather is the material mostly

used in purse making; pig-skin in particular, because of its hard wearing quality. Suede purses, though attractive in appearance, are less durable. Venetian leather purses, ornamented with medallions and designs in colours, are sometimes

carried by women, inside large purse bags. Velvet, silk, and satin, elaborately beaded and embroidered, are also materials for small purses to be used with various evening dresses.

To make a brocade purse, as illustrated, cut out a circle of brocade 7 in. in diameter, and a circle of silk or other lining of the same size. Sew the two together around the edge with a running stitch, then gather them up and attach them to a bone or ivory purse-top. Trim the inside, where the material meets the frame, with a little rose trimming or ribbon ruffling. Bone, metal, and tortoise-shell purse-tops can be bought at drapery stores.

PURSLANE. This is an annual plant (*Portulaca oleracea*) grown for the value of its leaves as a summer salad. Seed should be sown early in April, the seedling being thinned to 6 in. apart. As soon as the shoots are about 3 in. in length, they should be cut off close to the ground.

PUSH-PULL : In Wireless. A system in which two valves are used in an amplifying stage of a receiver or transmitter instead of one. The input is divided by means of a special transformer; one valve receives the positive, the other the negative half-cycle. While one is "pushing" the other is "pulling." The disadvantage of push-pull amplification, especially of battery-driven receivers, is that the high-tension current for that stage will be doubled. By means of a development of the principle known as quiescent push-pull, this drawback can be overcome. In this system each of the two valves concerned is given a considerable negative grid bias so that it remains "quiescent" with very little anode current flowing during that half-cycle when the other valve is actively amplifying.

Class B Amplification. The "Q.P.P." development is carried a step further by the "Class B" valve which is, in effect, two valves in one. For this method no grid bias is required, as only a small anode current passes when the grid is at zero potential. Therefore, it will always give a maximum efficiency for any given H.T. without any adjustment.

PUTLOG. On a builder's scaffold, putlogs carry the boards that form the floor. They are placed at right angles to the wall that is being built, with one end resting on the ledger of the scaffold; the other end is let into a hole left in the wall to receive them.

Putlogs are about 5 ft. long and 3 in. square. They are made usually of birch, and they are split and not cut, in order to avoid injuring the fibres of the wood, thus affording greater strength. The putlogs are as a rule placed about 4 ft. apart along the ledger. See Scaffolding.

PUTTEES. Worn at times by men, and women, round the legs, puttees consist of long, narrow bands of material usually cut from woollen cloth, but they may be specially

woven fabric bands. They are warmer and more comfortable than leggings, and in addition they have the advantage of giving substantial support to the legs. Being usually wound from the ankle to just below the knee, the leg is protected by at least a double, and mostly by a triple, thickness of the material, so that there is little danger of scratches and other injuries being suffered by the wearer. They are, therefore, very suitable for farmers and others engaged on the land, and for those who go out hunting and walking. They are usually made in khaki colour, sometimes in navy blue. Care and some skill are necessary in winding them round the leg, because, if badly wound, they look unbecomingly.

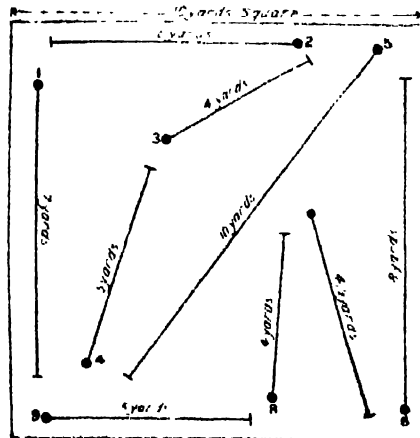
To obtain a smart effect puttees should be firmly and closely wound, but not so as to interfere with the circulation. The method is that of ordinary bandaging, a reverse being made in the puttee whenever necessary so that it may be flat to the shape of the leg. The usual procedure is to begin at the inside of the ankle and wind upward, but for horse-riding it is best to start below the kneecap and wind downward to the ankle.

PUTTING : On the Lawn. Putting can be practised on a lawn too small for croquet or lawn tennis. Apart from the land, the requirements are a few balls and two or three putters. Putting resolves itself into the playing of two kinds of putts: a long approach putt, and a short putt. The approach putt involves two ideas: first, the imagination of a line to the hole, and ability to hit the ball along the imagined line; second, judgment or instinct, born of habit, of the strength necessary to make the ball travel firmly to a spot close to the hole. The ball lies, say, 10 yds. or so away; a putter is taken, and the line of the putt inspected. It is well not to move either hand or body until the putter is still and the stroke is quite finished.

The short putt is of a different character, and is a comparatively simple business which requires little more than confidence in tapping the ball smartly to the hole.

Making a Green. A golfer can get putting practice and also a good deal of quiet recreation on an ordinary lawn. One way of doing this is to make the lawn into a miniature golf course, say, one of nine holes, although any number can be substituted. Holes can be made in the ground and a small flower pot put in each, or, if preferred, a metal cup can be bought for the purpose.

The holes should be disposed so as to give the greatest possible variety in the length and direction of the strokes. One will be made as long as the ground will allow, and the others arranged to give putts, each shorter than the other. The diagram offers a suggestion as to



Putting Green. Diagram showing how to lay out a lawn as a miniature golf course of nine holes

the laying out of the ground. A simpler way of obtaining practice is to make a single hole in the lawn and to aim at this from various distances. See Clock Golf, Golf, Midget.

PUTTY. As generally used in the household, putty is the material known as glazier's putty, and is composed of whiting and linseed



Putty. Applying putty in glazing a window frame

oil. The word is used in plastering to describe the fine stuff consisting of lime and water, it is also the name of a powder used in polishing glass and steel. Small quantities of glazier's putty can be obtained from any oil shop or from an ironmonger, but if a quantity is required, it is more economical to purchase a 7 lb. keg, when not in use, the lid should be kept on tightly. It is sometimes

advocated that the top be covered with a small quantity of linseed oil to prevent the putty hardening.

Should putty when purchased be very soft and sticky, a very small quantity of whiting may be added, by taking a lump of the putty in the left hand, sprinkling it with powdered whiting from the right hand, then rolling and kneading the putty. This process should be continued until the putty is an even paste, perfectly free from lumps.

When putty is too dry, the same operation is performed with linseed oil, which softens the material. Should it be short, or tend to crumble, it is an indication that it requires linseed oil, and the process can be hastened by slightly warming the putty. In some cases the putty may be prepared by placing a quantity on a clean board and beating it with heavy pieces of wood, one in each hand, much as if beating up butter. Usually, however, the best method is to knead the putty between the hands, as by this means its consistency can be judged. When exposed to the air, putty gradually gets hard, until finally it becomes almost as hard as soft stone.

A putty knife is a thin, broad bladed knife with a wood handle, the blade somewhat pointed at the end and more or less pear shaped. It is an indispensable tool for applying putty, stopping up small holes in wood work prior to painting, and for other purposes. See also Glass, Window.

PUZZLE JUG.

This name is given to a type of jug which has some unusual and unexpected feature. For instance, some

have a series of hollow tubes running round the rim of the jug and through the handle. The tubes contain the liquid, and the spouts, which project from the rim, are so arranged that the drinker will be drenched unless he knows exactly which of the spouts to cover with his fingers and thumb.

These jugs have always a suggestion of rough humour about them, and many were made for the use of ale houses. To day they are sought by collectors. A few puzzle jugs were made in England in the 16th century. Later they were made in large numbers especially by the Staffordshire potters but also at Leeds, Liverpool and Bristol. Some were imported from Holland. They are often found with humorous inscriptions upon them.

Pyæmia. See Blood Poisoning

PYORRHOEA. Pyorrhœa is a disease commencing at the margin of the gum where this encircles the neck of the tooth. In the early stages it may be recognized by a redness of the gum margin, and a tendency to bleed when rubbed, e.g. with a toothbrush. It is caused by stagnation of secretions, which harbour multitudes of microbes.

The natural method of preventing the disease is to eat or masticate the foods which necessitate or stimulate mastication, and which rub, cleanse, and promote movement in the secretions surrounding the necks of the teeth. The foods which do this most effectually are generally of a somewhat fibrous nature, such as meat, fish, and particularly uncooked vegetables. The mastication of fresh fruit also is very suitable for preventing the stagnation of matter around the necks of the teeth, and the type of fruit which is most useful is such as is of a firm consistency and somewhat acid or tart, such as apples.

Artificial methods follow the same principles. A toothbrush is generally used to supply the friction necessary to keep the necks of the teeth clean, and should be used with an up and down motion, rather than across the teeth. As the toothbrush cannot be forced between the teeth very far without injury to the gum, a mouth wash of a slightly acid nature should be used to rinse the mouth, and this should be done fairly vigorously. A pinch of cream of tartar to about a wineglassful of water may be used. The importance of preventive measures may further be emphasized by recognizing that as age advances the predisposition to the disease increases. See Teeth.

PYRACANTHA. This is a favourite evergreen shrub which bears white hawthorn-like flowers in spring and red or yellow fruits in autumn. It will thrive in the open, but is more commonly planted against house walls, where it forms a decorative covering in spring and autumn, and is pleasant to look upon all the year round. The common kind is *Pyracantha coccinea* (the fire thorn), which bears red fruits; the variety *Lalandii* has orange-red fruits, while those of *angustifolia* and *rogersiana* are orange yellow.

Pruning, which should be done in winter or early spring, takes the form of thinning out crowded or weakly branches, or if the shrub is on a wall of keeping it within bounds. Propagation is by sowing seeds out of doors as soon as they are ripe.

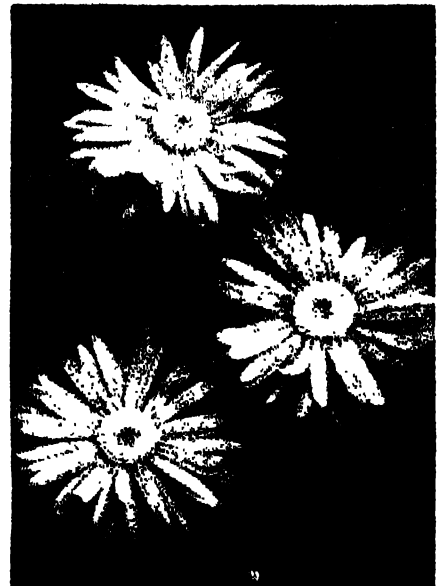


Puzzle Jug. Quaintly fashioned jug in Wrotham slip ware
British Museum

PYRAMIDS: The Game. The game called pyramids is played on a billiard table with 15 coloured balls, usually red, and the white ball which is used as the striking ball. The coloured balls are arranged in the form of an equilateral triangle, and the object of the players is to strike one of them with the white ball in such a manner as to pocket a coloured ball, points being scored accordingly. The balls used in pyramids are slightly smaller than ordinary billiard balls.

Pyramids is usually played by two persons, but it can be played by four, or by any other convenient number forming sides. It is a game of winning hazards exclusively, cannons being ignored.

When the 15 red balls are placed on the table, practically everything, between players of approximately equal skill, who strike a good winning hazard, depends on getting an opening for a break. Safety play is so greatly the deciding factor that first class players often



Pyrethrum, the variety H. Robinson. See below.

make stroke after stroke without the least intention of pocketing a ball. But when at last the desired opportunity does present itself, 4 or 5 balls are almost sure to vanish, and it is by no means unusual to see a break of 8 balls made, which ends the game at once.

Shell-Out. It is different when playing shell-out, a game often confused with pyramids, because it is played with the same number of balls and points are scored in the same way. But there is the important difference that shell-out is a round game for a number of players, whereas pyramids is a game between two players. When playing shell-out, a man draws a stake from each of the other players for every red ball he can pocket, and it is consequently the game to concentrate on every possible chance of taking a ball. The trouble is that while safety may close the game up for the next player, it is long odds against a bout of safety lasting until a man has another chance at the balls, a circumstance which makes safety the exception rather than the rule when playing shell-out. See Billiards.

PYRETHRUM. The most valuable plants in this group are the florist's varieties of *Pyrethrum roseum*, which grow from 18 to 24 in. high and bear single and double long-stemmed flowers in rose, crimson, blush and other colours in May and June. They are hardy herbaceous perennials which thrive best in well-drained soil. The way to propagate the plants is by lifting and dividing the clumps as soon as they have finished flowering.

Seeds may also be sown under glass in spring, the seedlings being grown on a reserve border in summer and planted finally in autumn. There are numerous named varieties. The noon daisy (pyrethrum or chrysanthemum) uliginosum grows 5 ft. high and bears large white daisy like flowers in late summer. It flourishes in ordinary soil, even on a shady border, and is increased by division in autumn. Pyrethrum aureum is the well known golden feather sometimes used as an edging to flower beds. It is raised from seeds sown in a heated glasshouse in spring. See Border; and illus. in facing page.

PYRIDINE. It is believed that the benefits derived in asthma from burning various fumigatory powders are due to pyridine. For use in asthma pour a dram on a plate and allow it to evaporate in a small room in which the patient remains for half an hour.

Pyridine is used with soap as an insecticide. Leaflet No. 106 of the Ministry of Agriculture gives the following formula for the treatment of apple aphid:

Pyridine (i.e. tar-distillate) 4 oz.
Soap (soft) 1 lb.
Water (soft) 10 gal.

See Asthma; Insecticide; Nicotine

PYRO or PYROGALLOL. Often, but wrongly, known as pyrogallie acid, pyro, as it is known to photographers, is more widely used than any other developer. Mixed with an alkaline substance or another developing agent, it produces negatives of fine quality, showing the characteristic yellow stain of pyro, which, however, often improves the printing value, especially of thin negatives.

Dissolved in water, pyro quickly oxidizes the solution, turning dark brown and losing activity as a developer accordingly. It is best kept in strong solutions containing an acidifying agent, potassium or sodium metabisulphite being added, when it will keep for several months. Pyro is sold in two forms, compact crystals and light feathery crystals, easily soluble in water. It is very poisonous, and must be kept in well-corked bottles.

Pyro is never used alone, but combined with an alkali, sodium carbonate or caustic soda, or another developing agent. In making up any formula the quantity of pyro in grains per ounce of developer mixed ready for use gives a useful indication of the strength of the developer. When weak, pyro brings out the first details in a negative quickly, but requires a comparatively long time to build up proper density; when strong, the image appears slowly, but density is rapidly gained, so that development is complete soon after the image appears.

Following are formulae for standard pyro combinations:

PYRO-AMMONIA			
A	Pyro	1 oz.	
	Potassium metabisulphite	1 "	
	Water	to 9 "	
B	Potassium bromide	1 "	
	Distilled water	to 9 "	
C	Ammonia (880)	1 "	
	Distilled water	to 9 "	

For normal use take 10 minims A, 10 minims B, 5 minims C, and 1 oz. water

PYRO CAUSTIC SODA			
A	Pyro	110 gr.	
	Sodium sulphite, 1 oz. (or 1 1/2 oz.)	300 "	
	Water	to 10 oz.	
B	Caustic soda	35 gr.	
	Water	to 10 oz.	

For use take 1 oz. of A and B and 1 oz. of water. This is a quick acting and very economical developer.

PYRO-METOL			
A	Pyro	40 gr.	
	Metol	35 "	
	Potassium metabisulphite	90 "	
	Potassium bromide	10 "	
	Water	to 10 oz.	
B	Sodium carbonate, crystals	1 1/2 "	
	Water	to 10 "	

For normal exposures take equal parts of A and B. This will contain 2 gr. of pyro to the

oz. of developer. For under-exposures take 1 part of A, 1 1/2 parts of B, and add 2 parts of water. This developer combines the characteristics of strong pyro and metol, and gives both detail and density quickly, the negatives being slightly greenish black. It is a good and reliable developer for the snapshot photographer.

The Watkins' development factor for pyro varies with the number of grains per oz. For the pyro-metol formula given above it is 9. See Developing; Photography; Pyro-Soda.

PYRO-SODA. The most commonly employed of pyro developers, and perhaps the most economical of all photographic developers, is pyro-soda.

When used without potassium bromide restrainer, which is quite unnecessary, it gives brownish or greenish black negatives of very good printing value, without the risk of fogging.

Pyro-soda is so called because the alkali which it contains is carbonate of soda, though ordinary washing soda is liable to contain impurities, and the photographic quality should be obtained. There are many pyro soda formulae differing principally in the proportions of the preservative and alkali, but that which follows will meet the amateur's requirements. The developer is always made up as two stock solutions, which are mixed and diluted when required for use. One contains the pyro with preservative, and the second the alkali. First make up the following:

TEN PER CENT PYRO STOCK SOLUTION			
Pyro	1 oz.		
Potassium metabisulphite	20 gr.		
Water	to 9 oz. 1 dr.		

A half-pint stoppered bottle is required. The water is boiled briskly to get rid of dissolved air, which would cause oxidation of the pyro, and allowed to stand till cool without being disturbed. Crush the metabisulphite, the preservative, and dissolve it in the water. Pour it carefully into the 1/2 pint bottle, add the pyro, and leave it to dissolve, the bottle being kept stoppered. Do not shake the bottle, or oxygen will be reabsorbed. This solution will contain almost exactly 10 per cent by weight of solid pyro. That is, every 10 minims of solution will contain 1 gr. of pyro. Made up exactly as described, it should keep for two years or more.

No. 2 ALKALI STOCK SOLUTION			
Sodium carbonate	8 oz.		
Sodium sulphite	8 "		
Water	to 40 "		

The carbonate and sulphite are dissolved in about 1 p. of hot water, which has boiled for some time, and the total made up to 40 oz. Keep it in a large corked bottle; a glass stopper is liable to stick on account of crystallization in the neck. It should keep for about a year. For use make up in the following proportions:

PYRO-SODA DEVELOPER			
10 p.c. stock pyro solution, 20 minims (or drops)			
No. 2 solution	1 oz.		
Water	to 1 "		

This developer will then contain 2 gr. of pyro per fluid oz., and will be suitable for practically any plate or film. For tank development 20 minims of the 10 per cent solution and 1 oz. of No. 2 may be used for each 4 oz. of developer, then containing 1/2 gr. of pyro per oz. When pyro is used for tank development it is essential to pour off the whole developer from the tank and return it once or twice to avoid uneven development. Merely shaking or tilting the tank is not sufficient.

The Watkins' development factor for pyro-



Pyrus Japonica. Flower spray of this decorative shrub
Courtesy of Amateur Gardening

soda varies according to the number of grains per oz. When potassium bromide is not included, the factors are as follows:

1 gr. per oz.	18
2 "	12
3 "	10
4 "	8
5 "	6 1/2

When required pyro stain can be removed from a negative by a clearing bath containing the following, alum, 1/2 oz.; hydrochloric acid, 1 dr.; water, 10 oz. See Developing.

PYRUS JAPONICA. A hardy leaf-losing red apple-blossom-like flowers in spring is familiarly known as japonica. It is an excellent shrub for a sunny house wall where it blooms earlier than in the open where, however, it may be planted.

The way to induce it to blossom freely is to prune the side shoots in summer and again in winter. There are several named varieties. In a warm summer Pyrus (Cydonia) japonica bears quince-like fruits which do not ripen, but may be used to make an excellent jelly. In recent years a new race of Japanese quinces, called Cydonia Maulei, has become popular; there are many varieties with flowers in salmon, red and bluish.

QUADRILLE: The Dance. In quadrilles the set is composed of 4 couples, who form a square, each couple facing the centre, the men standing on the left of their partners. In the first figure, the leading couple and their vis-a-vis start by crossing over and returning. In each case 7 walking steps are used and the left foot is brought up behind for the eighth.

This movement is called half right and left, because each dancer passes on the right-hand side of the first person met in crossing and the left-hand side of his own partner. They cross and return to the first 8 bars; setting to partners in the next 8 bars. This is passing on the right-hand-side, using 3 steps forward and the left foot brought behind and 3 steps back, bringing the right foot up to the left to finish, giving the right hand to partner and returning.

Then comes the ladies' chain, in which the women cross giving the right hand to each other and the left hand to the opposite men and the same back to place, while the men move round behind their partners giving the opposite woman the left hand and repeating the same movement to meet their own partners when they promenade holding hands, over to the place of their vis-a-vis, then return and perform half right and left to finish. There are 16 bars of music. The side couples now repeat this figure.

In the second figure, the woman of the leading couple, and the man of the vis-a-vis, advance and retire, using 3 steps and the foot brought behind, and then move to right and left, cross to each other's place, advance and retire. This is danced in 16 bars. Then all return to place, set to partners, and turn in 8 bars. This movement is repeated by the other couple each woman dancing with the partner of the opposite woman.

The woman of the leading couple and the opposite man change places in the third figure, giving the right hand, and return, giving the left to each other and then the right to their partners, so that the 4 dancers form a chain. They take a step forward together and one back, do this twice, then cross over to the

opposite couple's place. The two people who started the figure advance and retire twice, giving the nearest hand to their respective partners. All 4 advance and retire and then left and right to places. This is danced in 32 bars. The figure is repeated in the same order as the preceding one.

In the fourth figure, also 32 bars, the leading couple advance and retire, again advance and the woman remains on the left of the man of the opposite couple while her partner returns to place. The 3 advance from the other side, retire, then cross over, give hands round, cross to their original places and half right and left to finish. The side couples then repeat.

The fifth figure starts with all 4 couples joining hands, advancing and retiring twice. Then the top and bottom couples promenade to each other's places and turn. The two movements are performed in 16 bars. Then the ladies' chain follows for 8 bars and final promenade to places and turn for another 8. This figure is repeated, being started by each of the four couples in turn and sometimes again by each of the couples.

Another form of this dance is known as the Caledonian quadrille. In this the set is composed in exactly the same way as in the ordinary quadrille and there are 5 figures. The chief difference between the two is that reel time is used throughout the Caledonian quadrille. The first figure is danced in the same way as in the quadrille, but there are slight differences as regards the other figures. The line of the dance is a promenade all round. See *Lancers*, Reel.



Quaigh. Shallow Highland drinking cup in wood, with two handles.

QUAIGH. The Highland drinking cup, known as a quaigh or quach was rarely seen south of the Grampians until towards the close of the 17th century. It is in the form of a shallow bowl of oak or other wood, with two small ears or handles, and usually without ornamentation, being one of the simplest of drinking vessels and probably of very ancient origin. It was also made in pewter and horn, and some were of silver, but the earliest quaighs were all carved from blocks of wood and made with staves and hoops.

In the 18th century the quaigh found its way to the lowland houses, and was embellished with silver mountings. Other uses were found for it, and quaighs were utilized as alms dishes and served in some Scottish churches as communion cups.

Quail. These birds may be cooked in the same ways as pigeons. See *Pigeon*.

QUAKING GRASS.

This is an ornamental flowering grass about a foot in height. It is quite hardy and is easily raised from seed sown in the spring in ordinary garden soil. It may be cut and dried for the purpose of indoor decoration. The commonest is *briza maxima*, others are *media* and *minor*. See *Grass*.

QUAMASH. This is a hardy bulbous-rooted plant belonging to the lily family. It grows from 12 to 24 in. high, and produces spikes of white or blue flowers in May and June. These plants thrive in ordinary soil, and should be planted in autumn about 5 in. deep. The botanical name of quamash is *Camasia*. The chief species are *esculenta*, blue, and its white variety *Leitchii*, *Cusickii*, pale blue, and *Fraseri*, pale blue. Propagation is by offsets taken off in autumn or in early spring.

QUARANTINE. The period during which a ship on which an infectious disease has occurred is kept out of port, or, at any rate, from free personal communication with the shore, is called the quarantine period. Arrangements are made for a special mooring place at which persons can be landed from ships which are infected coming from foreign ports, and for the medical examination of all on board. Hospital accommodation is provided at or near the port for actual or suspected infectious diseases, and the medical officer is provided with the other passengers are proceeding or have been microscopically examined and have names and addresses so that they can be kept under observation. Similar arrangements are normally made of all made to prevent the spread of infectious diseases by persons arriving from abroad by sea or air.

The term quarantine is also used to describe the period of isolation of persons suffering from the disease, or convalescing after, an infectious disease, or the period during which a person exposed to infection must be of landing in the premises of a registered veterinary surgeon or other place authorized for the purpose. The period fixed by the Ministry is the usual length of time the disease is infectious. In some diseases, especially scarlet fever, the patient may be infectious for a long time after the usual quarantine period has elapsed.

Principal application of quarantine periods in Great Britain concerns school children. The length of time an infectious child has to be prevented from mixing with other children at school or elsewhere is fixed by the school medical officer, who is usually also the local medical officer of health, for each local education authority. Children living in the same house or belonging to the same family may have already contracted the disease from the sufferer.

If the children show no signs of infection, they are known as contacts, as are others in touch with the patient. They must be kept away from school and from contact with other children until such time as the disease would have shown itself, had they contracted it.

In the above table are shown the quarantine

Quarantine Period
(Period of Exclusion from School)

Disease	Patient	Contacts
Cerebro spinal meningitis	Three months at least from onset of disease	Three weeks
Chicken-pox	Until all scabs have gone; usually three weeks	For those who have not had the disease, three weeks As for patient
Diphtheria	Depends on bacteriological tests	Three weeks
Encephalitis lethargica	Until recovery (at least six weeks)	May attend if doctor certifies
Erysipelas	Until rash and peeling gone	For those who have not had the disease, three weeks
German measles	Not less than a week from appearance of rash	May attend usually
Influenza	Until recovery	For those who have not had the disease, three weeks from onset of last case in the house
Measles	Until morbilli discharges have ceased (three weeks at least)	Three weeks
Mumps	A week after the subsidence of swelling (at least three weeks)	Three weeks
Poliomyelitis	Until pronounced free by a doctor	Three weeks
Scarlet fever	Two weeks after release from isolation or from hospital	Five days, seven days after patient is removed to hospital or released from isolation allowed by some authorities
Smallpox	Until free from scabs (at least six weeks)	If not recently vaccinated, sixteen days
Typhoid fever	Depends on bacteriological tests	May attend
Whooping cough	Until six weeks from commencement of whoop	For infants only, three weeks from last exposure
Typhus	Until cured	If free on inspection, may attend

Quarantine Table showing quarantine periods for various infectious diseases

periods for infectious diseases adopted by most of the education authorities in Great Britain. The arrangements are made for a special mooring place at which persons can be landed from ships which are infected coming from foreign ports, and for the medical examination of all on board. Hospital accommodation is provided at or near the port for actual or suspected infectious diseases, and the medical officer is provided with the other passengers are proceeding or have been microscopically examined and have names and addresses so that they can be kept under observation. Similar arrangements are normally made of all made to prevent the spread of infectious diseases by persons arriving from abroad by sea or air.

Quarantine of Dogs. All dogs entering Great Britain from the Continent and abroad the period of isolation of persons suffering from the disease, or convalescing after, an infectious disease, or the period during which a person exposed to infection must be of landing in the premises of a registered veterinary surgeon or other place authorized for the purpose. The period fixed by the Ministry is the usual length of time the disease is infectious. In some diseases, especially scarlet fever, the patient may be infectious for a long time after the usual quarantine period has elapsed.

QUARRY. This name is given to a square or lozenge-shaped piece of glass sometimes set in leaded lights. Quarries are painted with figures or patterns and inserted in otherwise plain lights. They are also seen as plain squares set diagonally in 15th-century church windows to divide panels or roundels painted with pictorial subjects. See *Stained Glass*.

Quart. This measure is used for milk, beer, and other liquids. It consists of two pints; and four quarts make a gallon.

QUARTER: The Measure. This measure or weight is the fourth part or quarter of a hundredweight, containing therefore 28 lb. or 2 stone. As a measure of capacity, used for grain, etc., the quarter contains 8 bushels. From it has sprung the words quart and quartan, used in measuring food and drink.

See *Avordupois Weight*

QUARTER : Of Meat. This word is used for the parts of a beast when it is cut up for human food, the idea being that it is quartered or divided into four. The parts are known from their position on the animal as the fore-quarters and the hind-quarters. *See* Beef; Carving; Joint; Lamb; Mutton.

QUARTER DAY. Quarter days are days on which are due the rents of houses taken by the quarter and certain other payments. In England, Wales, and N. Ireland they are March 25 (Lady Day), June 24 (Midsummer Day), September 29 (Michaelmas Day), and December 25 (Christmas Day). In Scotland, quarter days, called term days, are Feb. 2, May 15, Aug. 1, and Nov. 11. *See* Rent.

QUARTERING : In Woodwork. Quartering as a form of decoration in woodwork consists in the division of a surface into 4 parts, the grain of each portion running in a direction contrary to that next to it. Its most general use is in decorating flat surfaces of furniture. *See* Graining; Oak; Veneer.

Quartering : Of Timber. This term applied to timber means timber having scantlings from 2 in. square up to 6 in. square.

QUARTER LOAF. A loaf of bread weighing 4 lb., which is known as a quarter loaf, is not a fancy bread, but a household quality, and must be sold by weight. In making a batch of bread the dough for each loaf should be weighed off before baking, or it will be impossible to obtain equal-sized loaves. *See* Bread.

QUEEN ANNE STYLE: DECORATION & FURNITURE

The Graceful Elegance of the Walnut Period

Pieces of furniture made in this style are referred to in a number of articles in our work. The reader may therefore consult such entries as Chair; Drawing Room; Screen; Settee; Tapestry. *See also* Furniture; Lacquer; Marquetry; Mirror; Silver; and the articles on the immediately preceding and subsequent period styles, William and Mary; Georgian.

In England the end of the 17th and beginning of the 18th century were marked by a period of great beauty in furnishing and interior decoration. At the end of the reign of Charles II walnut had superseded oak for finer pieces; by the time of Queen Anne the age of oak had practically finished except for strictly useful and farmhouse furniture. In the main her period was distinguished from those of the Restoration and of William and Mary by greater comfort and less stateliness, by elegance and grace rather than opulence of ornament and the grandeur which made the best furniture of the preceding periods only suitable for the homes of the magnificent.

Queen Anne furniture is also simpler than that of the Georgian styles, including Chippendale, which followed. It is this simplicity of line combined with exquisite beauty of workmanship, the lovely use of colour in lacquer and needlework, ornamental china and mirrors, imported Oriental carpets and rugs, which made her period style at once compact and homely and yet richly varied. It was open to Eastern artistic influence and the comforts which commercial overseas trade were making more generally possible.

The architecture also underwent a change, largely brought about as the result of fresh ideas from Holland during the previous reign moulded and reproduced by such distinguished men as Sir Christopher Wren and Sir John Vanbrugh. The last named was responsible for the most famous house of the period, Blenheim Palace. Dutch architects also did much work in the royal palaces and had a great influence on Queen Anne style in building, as also had the carvings of Grinling Gibbons on the interior decoration.

The smaller houses were of brick, and built for the most part on rectangular plans. The shaping of the gables with scrolled outlines was one of the most characteristic Dutch features. The window frames were flush with

QUASSIA. The wood of the quassia tree in the form of chips is used both as a tonic in medicine and in gardening to destroy insects. The chief medical preparations are infusion of quassia, dose $\frac{1}{2}$ to 1 fluid oz., concentrated solution of quassia, and tincture of quassia. $\frac{1}{2}$ to 1 fluid dram. Quassia is frequently combined with iron in bitter tonics prescribed for anaemia and debility. The infusion is often made at home by letting the chips stand overnight in cold water, or by leaving water in a bowl made of quassia wood. The action of quassia is mainly in the mouth where it stimulates the gustatory nerves, the gastric vessels are reflexly stimulated, with the result that the gastric juice pours out. This secretion is temporarily diminished when the bitter saliva itself passes into the stomach. It is sometimes employed to kill threadworms, $\frac{1}{2}$ to $\frac{1}{4}$ pint of it being injected into the rectum.

Garden Uses. In the garden quassia is useful for clearing gooseberry or currant bushes of caterpillars in spring. The chips are boiled in the proportion of 1 oz. to a quart of water; a similar quantity of soft soap is added, and the bushes are sprayed with the mixture thus obtained. *See* Insecticide; Spraying.

QUARTREFOIL. The quartrefoil is a conventional treatment of a flower form with four lobes which is employed in stone and wood carving, and is a common feature of Gothic ornament. Like the trefoil and the cinquefoil, it is based on a geometrical construction. *See* Stone; Woodcarving.

upper and lower parts of the chimney piece were designed to harmonize as a whole instead of as separate features. Internal doorways were made decorative by the introduction of boldly moulded architraves and pediments. Carving was employed in the decoration of mouldings on the panels, but was on the whole sparingly used and with good effect.

A beautiful drawing room or parlour of this period style is illustrated in Fig. 1. The panels are 3 ft. wide and reach from dado to cornice. The dado shows a projecting moulding running all round the room, while the panel mouldings are enriched with carving and pediments, the detail of which forms part of a co-ordinated scheme enhancing also the fire place and the door (not seen in illustration). Over the fireplace is a picture let into a panel arranged for its reception. Swags of carved fruit and foliage surmount the pilasters are employed at either side.

Belection moulding is characteristic of the style. Up to this time it had been usual for the panels of a room to be recessed below the level of the stiles and muntins which surround them, the intervening moulding being practically an elaboration or agreeable modification of the square section of the edge of the board. But the belection moulding became a feature in itself and projected in front of both panel and stile.

Walnut was employed in some cases for panelling, but less expensive was the pine panelling, which was usually painted cream or light green. Occasionally it was lacquered and painted in Chinese or Indian style with coloured decorations and raised and gilded portions on the panel designs.

Wallpapers were imported from China and a few were manufactured in England with hand blocked and part stencilled designs showing Oriental influence, but these were rare, and the most general form of interior decoration was painted panelling.

The plaster ceiling of a Queen Anne room was usually panelled out in a large way in conformity with the walls. The mouldings would be prominent, and the decorative enrichment, although bold, would be confined to suitable positions and not scattered indiscriminately. The floor would be of oak boards



Queen Anne Style. Fig. 1. Drawing room or parlour decorated in typical Queen Anne style, with large panels surrounded by broad raised moulding enriched by carving. The chimney piece has a panelled picture and pilasters, and the carpet is Oriental.

Courtesy of White Alion

or parquet. The fire basket grate for burning coal was speedily ousting the open hearth for logs.

Typical Furniture. Domestic furniture of the Queen Anne period was chiefly of walnut, although beautiful pieces are existent made of other fruit woods such as pear, plum and apple, and much fine work was lacquered, especially cabinets and chairs. Oak, chestnut, cedar, and other woods were used for constructional or foundation work, and walnut for the outer parts of the pieces. The bulk of this walnut furniture was veneered, probably as much upon deal as upon oak, although naturally the existing pieces are mainly the oak ones. For veneering, burr walnut, acacia, olive-wood, and laburnum were employed, and finely grained walnut logs were set aside for oyster grain veneer.

The most beautiful Queen Anne walnut furniture does not rely on ornament, but on perfection of grain, line, and proportion. The varnish used cannot be imitated by the acid bleaching preparations employed to simulate the effect of period walnut.

Inlaying and marquetry were as much used in Queen Anne's time as they were in that of William and Mary, and this is a feature of many pieces in those styles. Cross banding, feather edging, and herringboning were used upon bureaux, chests, and grandfather clocks. A characteristic feature of the marquetry of the time was its enclosure in panels outlined by parts of circles, and frequently combined with oblongs having rounded ends. The grounds of these panels were of wood differently coloured from that of the rest of the piece. The scalloped shell is a characteristic detail of the period. It is shown above the panels in Fig. 1 and also on the chair decorated in lacquer work, Fig. 3.

The general lines of furniture became curvilinear instead of vertical and horizontal, and the cabriole leg was now first introduced and reached the form in which it was standardized for the next 50 years, with variations in knee ornaments of shells and acanthus leaves, and in scroll, club, hoof, claw, and claw and ball feet. Stretchers disappeared from chairs and settees during Queen Anne's reign and re-appeared in some of Chippendale's pieces, especially in the Chinese style.

Queen Anne chairs, settees, and stools had upholstered seats. Moreen was employed as an upholstering fabric, velvets and brocade sometimes, but the bulk of these pieces for parlour use were covered in needlework. Cross-stitch and petit point were employed in coloured wools on canvas. A winged or grandfather



Queen Anne Style. Fig. 2. Chair covered in petit point needlework and having cabriole legs with club feet.
Courtesy of M. Harris & Co.

style chair covered in beautiful needlework is shown in Fig. 2.

Some of the chairs were made with pierced, scrolled, deep rails, and with turned or scrolled legs; while others, more typical of the period, were without the piercing and scrolling, but had hoop and splat backs. Settees in the form of two linked chairs were also products of Queen Anne's day. The broken pediment and also the lunette or semi-circular shaped pediment observed in architecture were seen in mirror frames, bureaux, and china cabinets.

Dressers on cabriole legs replaced the heavier ones of the 17th century; sideboards and large dining-tables

are apparently not known in this style. Many side tables, however, are in existence.

A representative piece of furniture is shown in Fig. 4. This knee-hole dressing-table is exactly like the knee-hole writing-table of the period in construction. The handles should be noted as they are typical of Queen Anne style. Bureaux of the bureau-bookcase type

were made in great variety and also double chests of drawers or tallboys. Built-in cupboardboards with shelves were used for the display of china and for books, though movable bookcases are to be found protected by small oblong latticed doors. The Queen Anne style is famous for its mirror frames, which have been much copied. These were in pine, gilt, or walnut, and relied almost entirely for effect upon their flat shapings. A bird or shell was frequently introduced above the mirror itself (see page 787). Another decorative piece was the screen. These were covered in stamped leather or brocade, or lacquered in Oriental style. The firescreen, usually a needlework panel framed in walnut on a stand, also appeared with the established use of coal fires.

The immense increase of trade with the East and the more general use of tea as a beverage caused china to become a fashion, with the consequent increase in the output of beautiful ware. For the same reason many cabriole-legged tea tables of various designs belong to this period, and, as gambling was a favourite pastime, it became necessary to provide card tables that were fitted with receptacles both for counters and for glasses. These card tables showed the varieties of cabriole legs, and often had enlarged corners for candlesticks. The legs were movable and hinged to the back of the underframing. All the well known pieces of Queen Anne style furniture are reproduced more or less successfully to-day according to the beauty of the materials selected and the workmanship employed on their manufacture.

QUEEN CAKE. These small fruit cakes are made by beating together 5 oz. castor sugar and 5 oz. butter (or margarine and lard mixed), whisking in an egg, and beating for a few minutes. Add another egg, continue beating for about 6 minutes, then fold in 9 oz. flour, previously sieved, together with one teaspoonful



Fig. 3. Chair, dating from Queen Anne's time, with cabriole legs and stretchers. Fig. 4. Walnut knee-hole chest with seven drawers and a cupboard, the walnut toilet mirror completing a beautiful piece of bedroom furniture.
Courtesy of Country Life and Gill & Raigate, Ltd.

baking-powder and mixed with the grated rind of a lemon, $\frac{1}{2}$ lb. clean currants and $\frac{1}{2}$ oz. candied peel, all cut into small pieces. Turn the mixture into some small greased fancy cake tins and bake the cakes in a hot oven for 20 min.

QUEEN LILY. Three species of the queen lily, *phacelranassa*, a S. American half-hardy bulbous plant, may be grown in Great Britain in a warm sheltered border out of doors, or in the greenhouse. Some of the best are the scarlet *ventricosa*, vermilion-shaded *schizantha* and yellow *chloracea*.

QUEEN OF THE PRAIRIE. This is a herbaceous species of meadow sweet botanically named *Spiraea lobata*, about 4 ft. high, producing heads of rosy carmine flowers in June. It should be planted in a shady, moist border during autumn.

QUEEN POST. In building, this name is given to two posts in a roof truss used for supporting a large roof with a span of from 30 to 45 ft. It is not so generally employed as the shorter king post truss, but is suitable for a small roof with a lantern light.

The roof truss comprises at least 9 elements. The horizontal member, called the tie beam, reaches from one side of the building to the other, and rests on the walls. The queen posts are tenoned into the tie beam, and the principal rafters are framed into the latter and the top of the queen posts. A straining beam is fitted between the two queen posts, and struts are placed between the latter and

mixture, and bake it for $\frac{1}{2}$ hour. When it is nearly cold spread on it a layer of jam, and on top of this pile the stiffly beaten whites of eggs. Put the pudding back into the oven until the meringue is a good biscuit colour. See Meringue; Pastry.

QUEEN'S WARE. This term was first adopted by Josiah Wedgwood about 1765 to describe his improved cream ware, of which he presented a breakfast service to Queen Charlotte. Cream ware was the basis of all the earthenware fabrics produced at an earlier date by Whieldon, even when the nature of the body was concealed by agate and other decorations. The paste was a mixture of flint and clay, as used for Staffordshire salt glaze.

The improvements made by Wedgwood resulted in an earthenware of light texture, in various shades of cream, straw, and saffron, well potted, with a soft glaze. His final improvement was to introduce Cornish groganstone. The effect was such that delft and salt-glaze were driven out of the market. Wedgwood's own services of dinner, dessert, and tea ware were usually made in this material, which is still produced at Etruria. He decorated it in hand painted designs, and a sparing use of fire-gilding and sent large quantities to Liverpool to be transfer-printed. Gold lustre was also employed.

The collector may usually identify this ware mainly by the Wedgwood mark, because some rivals attained a very close imitation of its



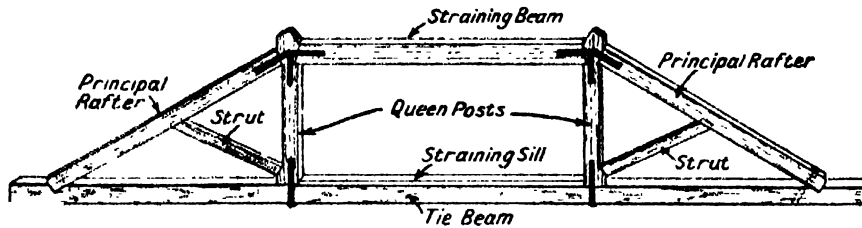
Queen's Ware. Cup and saucer bearing the Wedgwood mark. The transfer was printed at Liverpool. British Museum.

mixture, shaping the latter with the aid of a knife dipped in hot water to form the quenelle into an oval. Then dip another tablespoon into hot water, and with it remove the quenelle from the first spoon into a well-greased frying-pan filled with boiling water or stock. Poach the quenelles for about 12 min., keeping them basted with the water.

When they are cooked, take them out of the pan, drain them well, and arrange them on a dish, afterwards coating them with some white sauce made from 2 oz. each flour and butter, 3 gills milk, 1 gill good, flavoured white stock, a squeeze of lemon-juice, and a sufficiency of seasoning.

Quenelles of veal and rabbit are made in exactly the same way. They may be varied by adding equal quantities of lean ham or bacon, and a little finely chopped onion. In making all quenelles, seasoning is important. Care must be taken to prevent them being misshapen. Garnish with green peas, or chopped French beans, or sprigs of parsley.

Fish Quenelles. For these use whiting for choice, as it is easier to work with; but most fish can be used. Skin 3 large rock whiting and remove all the flesh from the bones, then pass it through a wire sieve. The back of a wooden spoon is best to use for this purpose. Allow for each whiting 4 oz. bread or flour panada, 2 eggs, and seasoning of cayenne pepper and salt, also a little mace or



Queen Post. Illustration showing the employment of two uprights in a roof truss.

the rafters. A straining sill is fixed between the queen posts to prevent the stress from the struts shearing the tenons of queen posts.

Iron stirrup straps connect the queen posts and the tie beam, and three-way straps are secured on each side of the rafters, queen posts, and straining beam. A typical example of a queen post roof truss is illustrated. See King Post.

QUEEN'S CUSHION. The popular names of queen's cushion and dovedale moss are given to one of the mossy saxifrages named *hypnoides*. This is a hardly low growing plant which forms spreading moss-like tufts and bears white flowers in May. It flourishes in the rock or wall garden, or as a border edging, in well drained soil in sunshine or slight shade. The variety *Kingii* is of particularly dense growth and makes a delightful moss-like cushion though it does not flower freely.

QUEEN'S FLOWER. This is one of the names of the Indian *crêpe* flower, *Lagerstroemia indica*, a shrub or small tree suitable for cultivation in a greenhouse having a minimum temperature of about 50 degrees. It bears beautiful rose-coloured flowers which have prettily curled or crimped petals, hence the name *crêpe* flower. It may be grown in large pots or in a border; a well drained compost of loam, peat and sand suits it.

QUEEN'S PUDDING. To make queen's pudding, boil $\frac{1}{2}$ pint milk with 3 oz. castor sugar, a little lemon rind, and 1 oz. margarine, then pour this on to 3 oz. breadcrumb. Allow the whole to cool slightly, and mix in the yolks of 2 eggs and the juice of a lemon. Line a pie-dish with 3 oz. short pastry, and put a strip of pastry around the edge. Fill it with the

qualities, notably Elijah Mayer of Hanley. Queen's ware was produced in most of the styles already mentioned at Leeds, while at Stockton, down to about 1848, a reproduction of the Etruria fabric was made by Smith and marked W. S. & Co's queen's ware. See Pottery; Wedgwood.

QUENELLE. The rich white forcemeat known as quenelle is served sometimes as an entrée, but is also used as a garnish for soups and made dishes. Quenelle may be made either with meat or fish, but the meat must consist of veal poultry, or game and the fish of some delicate variety that can be pounded very finely.

When quenelles are served as a garnish for clear soups they are made up with teaspoons, then are poached and laid at the bottom of a hot soup tureen, the soup being poured over them gently.

Chicken Quenelles. For these put 10 oz. cold chicken through a fine mincer and pound it well. Melt $\frac{1}{2}$ oz. butter in a saucepan, add twice as much flour, and mix the two ingredients well before adding $\frac{1}{2}$ gill white stock. Bring the whole to the boil, cooking it until it ceases to adhere to the sides of the pan, and keeping it well stirred. When the mixture has been allowed to cool slightly, add the minced chicken, season the whole with pepper and salt, and beat in an egg. Pound all these ingredients together, then rub them through a sieve.

Shape them into quenelles in the following way. Well fill a tablespoon with some of the



Quenelle. Quenelle of chicken served with white sauce and garnished with green peas.

nutmeg. Mix these ingredients with the flesh of the fish, shape the quenelles and poach as for chicken quenelles.

A very simple fish quenelle mixture may be quickly prepared by pounding the flesh of 2 large whiting in a mortar with the hard-boiled yolks of 2 eggs, 2 oz. bread panada (the bread to be soaked with boiling milk, hot stock or water), 3 oz. fresh butter, and seasoning. Separate the yolks and whites of the eggs, and steam the yolks in a cup or jar by themselves, leaving the whites raw. When

other ingredients are well mixed work in one tablespoonful chopped parsley and the whites of the eggs whipped to a stiff froth. When all are incorporated the quenelle meat is ready.

QUICK. The hedge plant quick, or hawthorn, may be planted during late autumn, winter, and early spring in soil which has been dug over to the depth of about 2 ft. The plants should be put in about 6 in. apart. A double row will make a much stiffer hedge.

Quickset Hedge. This is a very old term signifying a live fence or hedge set with quicks, a name generally applied to *Crataegus Oxyacantha*, the common hawthorn. For the production of a quickset hedge thorough soil preparation is essential, the ground being deeply trenched and allowed to settle down before planting either in Oct. or early Nov.

Four year-old plants of quick are to be preferred; they should be planted about 8 in. apart, and cut back to about 6 in. of the ground level. Cutting back in drastic fashion induces strong growth from the base. Some growers prefer a double row of plants. Hedge bottoms should always be kept clean, and the soil regularly forked over. See Hawthorn, Hedge.

Quicksilver. This is an alternative name for the chemical element mercury (q.v.).

QUICKSTEP: The Dance. The fundamental steps of the quickstep are the natural and reverse turns, from which all variations are built up. The natural turn is generally used on corners; the reverse (usually a section only) on the straight. As in the Fox Trot (q.v.), a slow step (S) takes two beats, a quick step (Q) takes one; the latter is danced on half a foot. Only one walk on, at the outside, two should be done between the steps. The weight of the body should be forward without leaning forward towards partner.

The natural turn, counted S Q Q S S S, is danced as follows: The man steps forward with right foot (on heel first, but going immediately on to ball turning out to R (S)), steps to side with left foot (Q) and closes right foot (R.F.) up to it (Q), steps back with left foot (L.F.), turning on it to R (S), closes R.F. back to L.F., turning from L. heel to R. heel (S) and steps forward with L.F. (S) (See Fig. 1). The girl (see Fig. 2) steps back with L.F., turning on it to R, to side with

R.F. still turning, closes L.F. up to R.F., steps forward with R.F., turning on it to R, to side with L.F., and brushes R.F. through (close to L.F.) as she steps back with it.

A three-quarter turn should be made on the complete step. Contrary body movement (C.B.M.) is used on the 1st, 4th and 6th steps. The 2nd, 3rd and 4th steps (Q Q S) constitute a chassé, this figure, however, may be taken straight turning, or to the side in other variations of the Quickstep.

The reverse turn (Figs. 3 and 4) is counted S S S S Q Q S. The man steps forward with L.F., turning on it to L, to side with R.F., still turning, back with L.F. back with R.F., turning on it to L, closes L.F. back to R.F., turning to L on R. heel (Q Q), and steps forward with L.F. C.B.M. is used on the 1st, 4th and 7th steps. It should be noted that on the counts "Q Q" the man actually makes one step only; but the girl makes two steps, therefore it is so counted.

The girl's reverse is as follows: Step back with R.F., turning on it to L, close L.F. back to R.F., turning from R. heel on to L. heel, step forward with R.F., turning with L.F., turning on it to L. Take small step to side with R.F. and close L.F. up to R.F. (Q Q), and step back with R.F. C.B.M. is used on 1st, 4th and 7th steps.

The most popular variations are the Quarter Turns and the Zig Zag, and an attractive movement can be made by joining them together, making the last step of the quarter turns the first step of the zig-zag.

The Quarter Turns, Figs. 5 and 6, are counted S Q Q S, S Q Q S. The man begins facing diagonally to R. He steps forward with R.F., turning on it to R, to side with L.F., still turning, closes R.F. up to L.F. and steps diagonally back with L.F. Steps back with R.F., turning on it to the L, closes L.F. back to R.F., turning to L on R. heel (Q Q) and steps forward with L.F.

Both girl and man make a quarter turn to the R. on the first four steps and a quarter turn to the L. on the last four. C.B.M. is used on the 1st, 5th and 8th steps. It will be noticed that the 1st, 2nd and 3rd steps are similar to the 1st, 2nd and 3rd of the natural turn and the 5th, 6th, 7th and 8th similar to the 4th, 5th, 6th and 7th of the reverse turn.

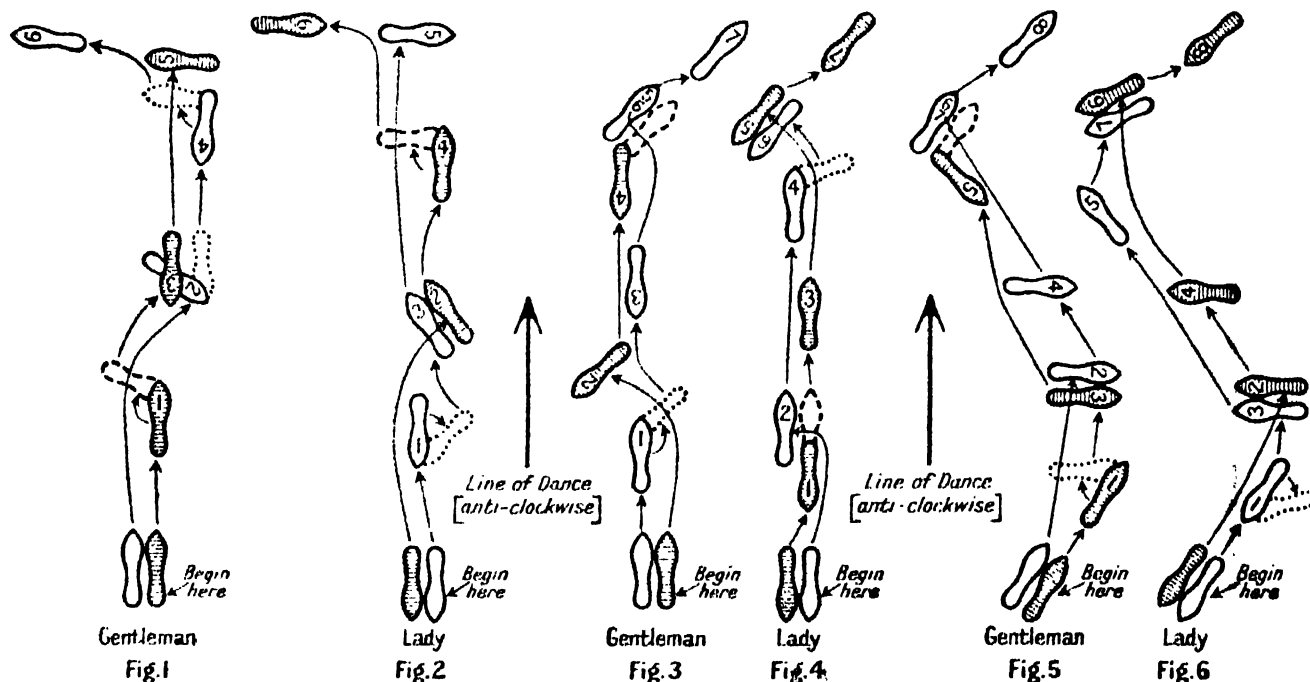
The girl's quarter turns are executed by stepping back with L.F., turning on it to R, to side with R.F., still turning closing L.F. up to R.F., and stepping diagonally forward with R.F. She then steps forward with L.F., turning on it to L, takes a small step to the side with R.F., closes L.F. up to R.F., and steps back with R.F. C.B.M. is used on the 1st, 5th and 8th steps.

The Zig-Zag is composed of five slow steps, as follows: The man steps forward with L.F., turning on it to L, to side with R.F., still turning, back (and across behind R.F.) with L.F., bringing partner outside, closes R.F. back to L.F. and steps forward with L.F. The girl steps back with R.F., turning on it to L, closes L.F. back to R.F., turning from R. heel on to L. heel, steps forward with R.F. outside partner, to side with L.F., and brushes R.F. through (close to L.F.) as she steps back with it. In this figure a quarter turn is made to the L. on the first two steps, and a quarter turn to the R. on the last three. C.B.M. is used on the 1st, 3rd and 5th steps. It should be noticed that the first two steps are similar to the reverse turn and the 4th and 5th to the 5th and 6th of the natural turn.

Another attractive variation that may be used with advantage after the quarter turns or the natural turn is the Cross Chassé, counted Q Q S. Following the last step of the quarter turns or natural turn, as the case may be, the man takes a small step to side with R.F., closes L.F. up to it, and steps forward with R.F. outside partner, going straight into the 2nd, 3rd, 4th, etc., of the steps of the Quarter Turns or other suitable variation. C.B.M. is used on the 3rd step. The girl takes a small step to side with L.F., closes R.F. up to it, and steps back with L.F. to go straight into next variation. C.B.M. is used on 3rd step.

Other well-known variations are the Quick step, the Corte, and the Drag.

In the accompanying diagrams the R.F. is shaded, the left in outline only. The dotted outline shows the position of foot after a turn has been made on it. Diagrams will be easier to follow if the dancer faces the direction in which the toes are pointing and turns the diagram as he or she turns. See Dancing, Fox Trot; Tango; Waltz.



Quickstep. Diagram showing the fundamental steps of the quickstep dance. Figs. 1 and 2 show details of the natural turn. Figs. 3 and 4. The reverse turn. Figs. 5 and 6. The quarter turn.

QUILLAIA BARK. Panama or quillaia bark, because of its chief constituent, saponin, has the peculiar characteristic of forming a frothy solution in water. It is inodorous, but has an acrid taste, and is used as a febrifuge and diuretic. It is useful in forming emulsions, and in the form of tincture of quillaia is an ingredient of numerous shampooing preparations. It is an expectorant, but care has to be taken in using it internally, as it may cause irritation of the digestive tract.

Cleaning Uses. One ounce of quillaia bark stewed for an hour in enough water to cover it, provides a simple means of freshening up suits that have become shiny. The liquid should be strained when ready for use, and then applied on a piece of material of the same colour as the suit itself. Fairly vigorous rubbing is required, and when this has been completed a clean, damp cloth should be placed over the suit and a hot iron used for pressing. See Emulsion.

QUILTS AND QUILTING

Modern Coverlets Worked in Simple and Traditional Designs

This article includes instructions on making a down quilt, patchwork quilts and some details for hand quilting work. Readers should also consult the entries on Down; Embroidery; Night-Wear Case; Patchwork; Woolwork.

A quilt is a padded bed coverlet usually of silk, satin, or sateen, with an interlining of sheep's wool, flannel or cotton wool or packed with a down filling. The down obtained from the eider duck is the best, and, incidentally, the most expensive. Some kinds of patchwork quilts are made without interlining and used over a separate lining, but the original idea was that the patchwork was the outer covering stitched through to a foundation lining. The stitching which holds a lining padding in place under another material is known as quilting.

Down Quilts. The down padded quilt is sometimes called a "bed-down," but only the most expensive are filled with the down from the breast and neck of the eider duck which is the softest filling known. Less expensive ones are cygnet and goose down, separated from the feathers and purified before use. Vegetable down is not suitable for this purpose as it so soon loses softness and becomes lumpy. Occasionally kapok is used mixed with bird down when a cheaper filling is required.

Down quilts are sold in double or single bed sizes and in many qualities. They can be made at home and covered with self-coloured material or with panels, borders or centre pieces of plain material, used in conjunction with a patterned fabric. When both plain and fancy materials are to be used, the panels and borders must be cut out and machined together. If the quilt is to be made entirely of one kind of fabric, the quilting design can be first marked out in chalk and then with a tacking thread on to the silk. Artificial silk is quite suitable for this purpose and cotton backed satin is also used. Some people prefer sateen for the underside of the quilt as it is less likely to slip off the bed than the other fabrics. For a quilt to be used on a double bed the silk will need joining, but this will probably not be necessary for a single bed or cot quilt.

Sometimes an inner case of down proof sateen is made, but this adds to the weight of the quilt. The case is formed by joining together the two pieces of silk or other fabric cut or made up to the required size. The wrong side of the material should be soaped or waxed, as shown in Fig. 1, before making up in order to retard the passage of the down. A piping of the same or contrasting material along the seam gives a professional appearance when the quilt is finished. One end must be left open for filling.

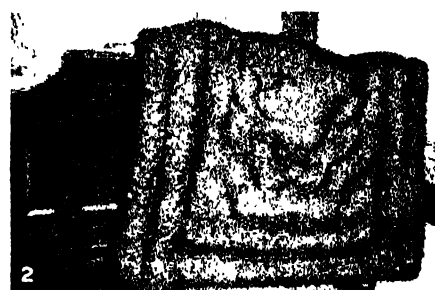
In the home the down has to be carefully put into the case by hand, and the end which was left open must be sewn securely. It should then be placed quite flat on to a large table or bed, and the down arranged as evenly as possible by careful shaking and tapping with the outstretched hands. Without moving or disturbing the down, tack along the lines marked out for the quilting, ascertaining that all the tacking stitches go right through to the underside of the case. This process is most important, as otherwise, when quilting,

the depth of the down padding will become uneven, and the whole appearance of the quilt will be spoiled. It is best to use a tacking thread of a contrasting colour. Fig. 2 shows the quilt filled with down and tacked for quilting.

Quilting can be done by hand by stitching along the lines of the pattern and taking the needle through to the underside at each stitch but this would make the work rather laborious. It is therefore more often done by machine. Test the machine on a piece of material similar to the cover; the stitch should be long, and neither top nor bottom tension



Quilt FIG. 1. SHOWING THE WRONG SIDE OF THE MATERIAL BEING SOAPED OR WAXED. FIG. 2. Quilt filled with down, and tacked ready for machining



should be tight. No trace of any puckers should be seen in the stitching.

When the machine is satisfactorily adjusted, raise the pressure foot to its greatest height, pass the quilt under it, commence stitching, and do not hurry the process. With the left hand carefully smooth out any creases in both the top and underside of the eiderdown cover.

If a hand sewing machine is being used, a second person to guide and arrange the eiderdown is a great help. The quilting completed, the tacking cottons should be removed carefully so that no down is drawn through in doing so, and five or six eyelet holes should be buttonholed at convenient distances in the centre of the quilt to provide ventilation. In another form of quilted bedspreads, the designs of the patterned silk, satin, sateen or chintz used for the covers are outlined with running stitches taken through the interlining of wadding. These spreads are finished with brightly coloured plain shantung or cotton linings and are most effective.

Patchwork Quilts. For cottage bedrooms and for use with four poster beds patchwork quilts are always suitable. They may be made of cambrics, gingham, sateen and other similar materials, or of silks. Sometimes they are composed of blocks of linen 6 or 8 in. square embroidered in woolwork and joined by alternate plain squares of a contrasting colour. Edges may be finished with plain banding or with a binding. Transfers can be obtained for such blocks. Another idea is to use alternate squares of a small patterned chintz and plain sateen. Designs for quilts which

more strictly deserve the name are made with patchwork and hand quilting and are interlined and lined, the quilting being worked on the plain border and plain squares.

Patchwork quilts can also be made by adapting the directions given in the first part of the article on patchwork (page 901). Sometimes the work forms a panel in the middle of the quilt and a border of 18 in. is added of plain material. Such patchwork requires a foundation. Haphazard, crazy patchwork is a way of using up odd scraps, but is only suitable for a cottage quilt. Fancy stitches such as feather-stitch, chain-stitch or blanket-stitch are used to attach the patches to the foundation. Whatever the design decided upon, begin by tacking the first patch to the centre of the foundation and arrange the others round it.

A foundation for a quilt should be cut and made to allow $\frac{1}{2}$ in. drop at either side of the bed and also at the end. When the top is completed turn in $\frac{1}{2}$ in. hem all round. If only the centre panel (large enough to cover the actual top of the bed) is of patchwork, a cotton foundation is cut just of the same size as the panel and the lining may be chosen of a suitable colour and cut the full size required so that it also forms the border.

Otherwise cut the lining material exactly the same size as the quilt, tack it in position, turn in the raw edges and tell to the patchwork. The most suitable material for lining

depends on the kind of fabric used for the patches. Sateen, woolback satin, jap. or Shantung silk is preferable for backing more elaborate silk or brocade patchwork. For cotton quilts use only cotton or linen for lining; a small patterned old English print, easement cloth, crash or coloured lawn are the materials which are generally employed.

A more formal type of quilt is not made upon a foundation, but the patches are cut out in geometrical shapes, such as triangles, squares, hexagons, and octagons, each piece being mounted on fairly stiff paper. Black and white triangles placed so as to form a box-shaped pattern is a familiar design that imitates fling, but the best effect is gained with octagonal shapes. Cut out a template the exact size of patch required and cut the pieces of mounting paper from this so that all the patches correspond. Place a paper hexagon on the table and see how the edges may best be joined to the surrounding patches without overlapping.

Cut out all pieces of material allowing $\frac{1}{4}$ in. turnings, place them on to the paper shapes, turn the raw edges, and tack to the paper.

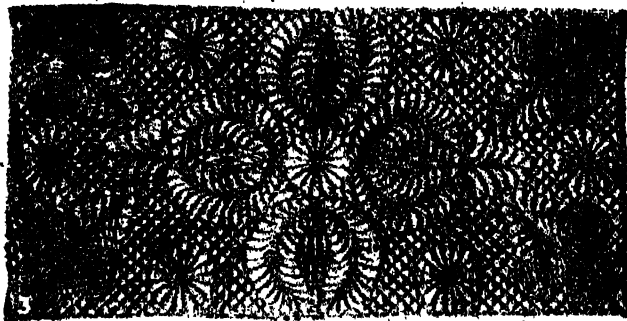
Prepare a number of pieces in this way before commencing to join them together. Place them edge to edge, right sides outside, and sew them with very small stitches, taking only a few threads of the material, or the patches will not lie flat.

When all the shapes have been joined together, a plain or quilted border can be stitched by hand or machined on to the patchwork, and the lining made in the way already described. It is particularly necessary when making such a patterned quilt to cut each

shape with accuracy, or the effect is spoilt, inaccuracies showing much more readily on a large surface than on small ones. The paper used for mounting the patches must be torn away before the quilt is lined.

Rosette Quilt. Most attractive for a country bedroom is a form of quilt dating from the 18th century, or earlier, made of rosettes. Some originals seen came from the West Indies, the materials used for the rosettes being soft, patterned cottons as worn by the plantation negroes. Any prints, patterned lawns or sateens may be used, provided that the scheme is harmonious and the effect light and dainty.

The method of making is simple. Cut out a cardboard template the size of a small saucer (about 5 in. in diameter), the paper shapes to correspond, and the pieces of material allowing for turnings. Having tacked these to the paper, whip round the edges of the material, and before drawing up tear away the paper. Each patch or rosette is like a little flattened circular bag with the gathered top uppermost and is joined by a few stitches to the adjacent patches, but made up in such a way that the quilt has an openwork effect through which the separate lining of some pretty, plain-coloured sateen shows.



Fancy Quilting. Plain quilting usually consists of lines of back-stitching arranged to cross diagonally about 1 or 2 in. apart. This is used sometimes with an interlining of wadding to make comforters, or small quilted spreads, and cot coverlets of silk or satin and may be done by machine or hand. Fancy quilting in which the stitchery forms a pattern is also employed on materials for such coverlets. Fig. 3 shows a traditional design from Wales for a full sized quilt. This style of work dates at least from the Tudor period and is still carried on by women in the colliery villages. The quilts are interlined with sheep's wool or cotton wool, covered with sateen or silk or other washable material and stitched all over by hand, as shown in the illustration.

An example of English quilting is shown in Fig. 4. This cot coverlet is of quilted satin, back stitched by hand with embroidered motifs worked in padded satin-stitch, stem-stitch and darned-stitch. Designs for quilting may be obtained through embroidery pattern services. Traditional quilting patterns are adapted to transfer form. Designs are also obtainable for quilting babies' shoes and bonnets, and for bedroom slippers, dressing-gowns and jackets.

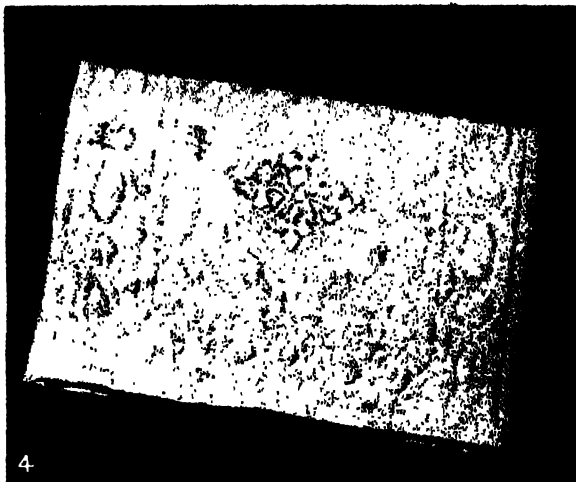
Italian Quilting. Small decorative pillows and night wear sachets to match the bed quilt are dainty accessories. They may be made of satin, taffeta or crêpe, the quilting,

lined with muslin and padded with cotton wool. The pillow foundations may be made of sateen and stuffed with down or kapok. Fig. 5 shows an example of a charming sachet in Italian quilting in which the design stands out with a raised effect. This work is equally suited to decorating a comforter, to be laid over the foot of the bed, to match the sachet or for a cot quilt, and such work would form a beautiful present.

The example illustrated is made of white georgette quilted over pink crêpe de Chine. The padding of the design consists of bright coloured wools. These are threaded between the two materials in the lines of the design and show through the georgette with the most delicate effect when quilted.

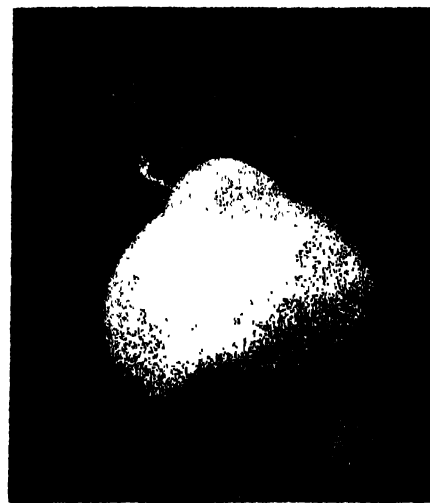
QUINCE. This Persian tree (*Cydonia vulgaris*) is hardy in Great Britain and is worth planting in small numbers in southern districts for the sake of its flowers and its large, hard, pear-shaped fruits, which make excellent marmalade. They need more than the usual quantity of water when used in this way. The quince is chiefly valued, however, as a stock on which to bud pear trees; it is known as a dwarfing stock, because it has the effect of dwarfing or restricting the growth of the pear trees and thus encourages earlier fruiting. For gardens of restricted size pear trees of the quince stock should be planted. The chief varieties are the apple-shaped, pear-shaped and Portugal. One named the Sorbian quince, introduced from the Balkan countries, is said to produce good crops even on young roots.

Quince Jam. The ingredients required for making quince



jam consist of 6 lb. quinces, 3 pints water, and 1 lb. lump sugar to every pint of pulp. Peel and quarter the quinces, and, after removing the cores, put them into a preserving pan with the water. Stew them slowly for several hours until the fruit is soft, then rub all through a wire sieve and measure the pulp. Put the whole back into the pan with the requisite amount of sugar, and boil it for ½ hour, or until it sets.

Quince Jelly. To make this jelly, peel and quarter a few quinces, and, after removing the cores, weigh the fruit, and to every lb. of this add ½ pint water. Cook slowly until the fruit is soft, then strain the whole through a jelly bag, and measure the juice. To every pint of this add 1 lb. sugar; put both



Quince. Hardy fruit resembling the pear, and much used for jams and jellies

into a preserving pan, and boil rapidly for about ½ hour, or until they set. See Jelly.

QUININE. Along with other alkaloids quinine is contained in cinchona bark. A large number of salts are formed with it, those most in use being the sulphate, the hydrochloride and the acid hydrochloride. The drug has a marked power to reduce fever. Its most striking characteristic is its power to cure malarial fever by killing the parasite.

The ammoniated tincture of quinine is a common and efficient remedy at the start of a cold in the head, or influenzal attack. A teaspoonful in a wineglass of water, at hourly intervals until 4 doses have been taken, will often cut short such an attack, if begun early.

QUINOL: In Photography. This is a photographic developer which is slow in action and tends to produce density in the high lights of a negative rather than to bring out details in the shadows or low lights. It thus gives negatives with great contrasts, which, while useful for special purposes, such as copying black and white drawings, are excessive for ordinary negatives. When quinol is mixed in the right proportions with metol, a very valuable developer, known as metol-hydroquinone, or M.Q., is obtained, in which the defects of both quinol and metol are overcome, the combined developer being quick acting, clean, and giving good gradation. See Hydroquinone, Metol-hydroquinone; Negative.

QUINSY. Acute inflammation of the tonsils going on to the formation of pus is known as quinsy. It most commonly attacks children and young adults. An attack often follows exposure to wet and cold, and a person who has one attack is likely to have another.

Usually the patient first complains of sore throat, with dryness and some pain in



Quilting. Three examples showing different types of quilting. Fig. 3. Hand quilting in traditional Welsh design. Fig. 4. Modern English hand quilting. Fig. 5. Italian quilting

swallowing. Pain may be felt in the ear and on opening the mouth. The swelling of the tonsils increases rapidly, and the temperature rises, sometimes to 105° while the pulse goes up to 120 or 130 beats per minute. The tonsils are very red and are coated with mucus. The patient's strength may rapidly decline. An abscess generally forms between the second and fourth day of the disease, and it bursts commonly into the mouth, but sometimes in the pharynx. This may occur during sleep or in a fit of coughing. Instant relief follows the bursting of the abscess. Frequently in children the disease does not follow this severe course. Treatment should be supervised by a doctor.

Quinsy is infectious, the patient should therefore be kept isolated. To guard against further attacks the neck should be bathed with cold water every morning, and the mouth should be rinsed morning and evening with solution of potassium permanganate, 4 drops

in a half glass of water, diluted glycerin of borax, 1 in 20, or a similar wash. See Tonsillitis.

QUINTAL. This measure of weight is really a hundredweight, being either 112 or 100 lb., according to the scale used. See Hundredweight.

Quire. This measure is used in selling writing-paper. A quire contains 24 sheets, and 20 quires make a ream. See Note-paper.

QUIRK. This is the name given to a narrow channel or groove separating one portion of a moulding from another. The name is also applied to the bead or fillet of a beading plane, and a tool, similar to a metal spokeshave, known as a quirk router, is obtainable for use in forming quirks. See Moulding.

Quoin. This is the name given to the external angle, or corner, of a building. See Brick: Concrete.

RABBIT KEEPING FOR PLEASURE OR PROFIT

With Some Attractive Recipes for Cooking Rabbit

The reader may consult the article *Fur* and those that will help him to make a simple rabbit hutch, e.g. *Amateur Carpentry: Chisel; Hammer.* See also *Belgian Hare; Havana Rabbit*

Rabbits can be kept in a comparatively small space, and be maintained to a considerable extent on waste products from the garden or allotment. Green food for a few animals can usually be obtained for the labour involved in collecting. Rabbits are worth keeping both for their flesh and their fur, while their manure is of value to the soil.

The principles of rabbit keeping are outlined in Bulletin Number 50 issued by the Ministry of Agriculture. The animals must be fed wisely, as unsuitable food quickly upsets them and prevents them from thriving. A properly balanced ration of sound and nourishing food should always be provided. Green food and roots judiciously given ensure good digestion. Generally speaking a rabbit thrives on a daily supply of food equal to 2 oz. per lb. of its live weight. Water should always be supplied. Changes of diet must be effected very gradually and feeding should always be at regular hours.

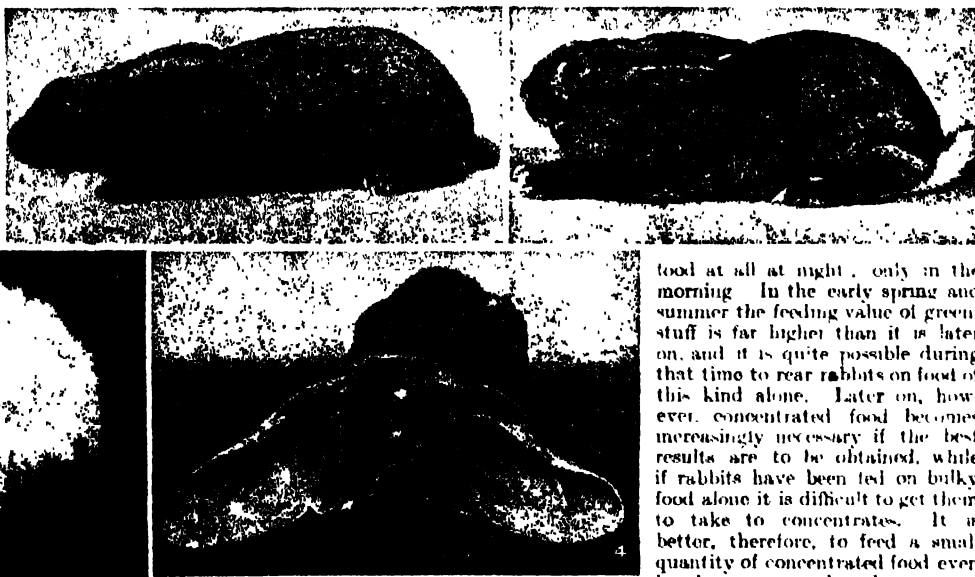
for breeding does and for young and growing stock than for older rabbits.

Bulk food, in the case of rabbits, covers a very wide range, almost all growing or dried plants, not directly poisonous being useful. A few only need be mentioned: cabbage cauliflower and broccoli leaves carrot and parsnip tops, pea haulms, strawberry runners the leaves and twigs of nearly all deciduous trees, e.g. apple prunings, poplar twigs and leaves, clippings from hawthorn hedges, etc. *Kohlrabi*, dried nettles, brambles, swedes,

sooner or later. Frosted greenstuffs or roots should also be avoided but, contrary to common belief, there is no harm in wet greenstuff so long as it is fed in reasonable quantities. Greenstuff of some kind or other or roots, should be fed to all rabbits at least once a day.

As regards concentrated foods, an albuminoid ratio of about 1 to 5 is suitable for all rabbits, but this proportion may be varied according to age. The materials commonly employed for other farm stock are also useful for rabbits and cover a wide range. The following mixture has been found to give good results in practice: Bran 6 parts, barley meal 2 parts, best white fish meal 1 part all by weight, mixed well together and water added till it is crumbly and moist. Separated milk, buttermilk or whey, if available at a cheap rate, forms a valuable foodstuff and may be used to moisten the mash in the place of water. Milk in any shape is particularly useful for very young rabbits and breeding does, and less fish meal is necessary where it is used.

Rules for Feeding. All rabbits should be fed twice daily at any convenient fixed times in the morning and evening. The bulk of the ration is better given in the evening. The following plan will be found most convenient: In the morning all rabbits should be given as much concentrated food as they will clear up in about 1½ hours. In the evening they should receive a liberal ration of greenstuff or hay or other bulky food. All nursing does and youngsters up to the age of about three months should be given the same amount of concentrated food at night as they had in the morning, and rabbits from about three months to six months old and pregnant does should be given about half this proportionate amount. Other rabbits should be given no concentrated



Rabbit. Pedigree varieties that are grown for their beautiful fur. 1. Silver. 2. Giant. 3. White. 4. Lop-eared Rabbit

A prospective purchaser of rabbits should visit a show and study the rabbits there. He should also read the papers devoted to them, note the names of successful breeders, and make inquiries about their reliability. A breeder should not start operations with more than one breed. If the rabbits are to be kept for pleasure and for their flesh, one of the heavier breeds, such as Belgian hare or Flemish giant, should be selected.

Suitable Foods. Feeding materials are divided into two classes, bulk food and concentrated food. The bulk food represents the main part of the ration for ordinary cases. Concentrated food is used to supplement the bulk food. It is required in larger quantities

before Christmas, mangolds, after Christmas, oat, straw, etc., are all useful. Beet leaves and potato parings may be given, while such plants as dandelion, sow thistle, clover, chickweed and groundsel are good.

With regard to greenstuff, special care should be taken to avoid sudden changes of any kind. Thus, if rabbits have been fed during the winter on a bulk food composed mainly of roots and hay, it is dangerous to change suddenly to large quantities of cabbage or dandelion. Care should also be taken to avoid the use of grass or other plants which may have been contaminated by the excreta either of other rabbits or of dogs, or trouble from internal parasites will certainly ensue

food at all at night, only in the morning. In the early spring and summer the feeding value of greenstuff is far higher than it is later on, and it is quite possible during that time to rear rabbits on food of this kind alone. Later on, however, concentrated food becomes increasingly necessary if the best results are to be obtained, while if rabbits have been fed on bulky food alone it is difficult to get them to take to concentrates. It is better, therefore, to feed a small quantity of concentrated food even in the spring and early summer. It is important always to inquire

as to the previous feeding of newly purchased rabbits and to introduce any changes gradually.

Stock should be watched and individual requirements studied. Most rabbits will eat a good deal more than they really require, and some suffer in consequence. The rate of growth of youngsters of breeds which have an adult weight of about 6 to 7 lb. should be 3 to 4 oz. per week. If large quantities of succulent greenstuffs or roots are being fed, water is not very necessary, but it is prudent to keep a supply of clean water in the hutches of breeding does and young stock.

Pedigree Rabbits. Pedigree rabbits of the best known and most popular breeds are just

as hardy and as prolific as their humbler relations. They may be fed on anything which a pig would ordinarily eat, excepting salty things, with this proviso, that all food given to rabbits must be absolutely sweet and fresh. Every imaginable type of table scraps, oddments of left-over pudding, crusts of bread, vegetable parings, apple peel, banana skins, orange peel, cooked potato peelings, even tea leaves, if set aside during the day in a white enamelled pail or bowl, may be utilized. These are chopped up roughly, scalded with boiling water, well drained, mixed to a dry, crumbly mash with a few handfuls of dry bran and given to the rabbits just before bedtime.

Rabbits for Fur. The following are the best known and most popular breeds of pedigree fur rabbits: The Giant Blue Beveren is a very large and beautiful rabbit, whose thick, soft fur is of a blue grey colour. It makes up into all sorts of wraps intended for hard wear, full length fur coats, capes, stoles, and muffs, besides being in much demand for trimmings of every description. There are certain cleverly dyed blue grey furs on the market which may be at once detected by gently blowing the fur apart. The natural coloured fur grows from a creamy white skin, but the dyed variety will be found to spring from a blue grey one.

The Giant White Beveren is a snow white rabbit with a rather long, soft coat and pale blue or pink eyes. Its fur makes evening wraps, children's coats and caps, and for trimmings. For furs for home wear this rabbit is well worth breeding, but it would not be as a rule, worth while to breed it for selling, on account of the strong competition in imported white rabbit furs.

The Black Beveren, or Sitka, as it is sometimes called, is a big rabbit with long, lustrous, soft black fur, which makes excellent coats, stoles, muffs, and wide bands of trimming for frocks and suits. The Chinchilla enjoys special popularity on account of its very beautiful soft, grey shaded coat, which should resemble real chinchilla as closely as possible in colour. It makes good wrap-coats and is much used for summer wear.

The Havana is a good sized rabbit, not quite as big as the foregoing ones. Its fur is an attractive and useful shade of brown. It makes good coat collars and cuffs, stoles, muffs and trimmings. The Argente de Champagne is a large rabbit whose rather long coat is of a very pale grey. When born the young ones are quite black, but they silver gradually through the black fur, so that at about 13 weeks they become silvery pewter colour. Their fur is useful for all ordinary purposes.

The Silver Grey is a rather smaller rabbit with a short, hard coat of closely mingled black and white hairs. Its fur makes good hard wear, collars, cuffs, muffs and stoles to wear with tailored suits. Of uncommon and attractive appearance, it makes up well into useful short coats. The Black and Tan is quite a small rabbit, very prettily coloured. Its coat is a fine glossy black, with dull orange points and hairs, which makes narrow dress trimmings, and is much used for fur-backed gloves and fur-lined bedroom slippers. The White Polish rabbit, which has pink eyes, has a short white coat so closely resembling Russian ermine that it is in great request for trimmings as a substitute for that very expensive pelt.

In all breeds alike a furrier cares only about the thick winter coats of fully grown rabbits and the quality of the fur makes more difference in the actual value than the choice of breed. It is best to start with only one or two varieties of pedigree rabbit, of which the Chinchilla and the Blue Beveren would be a very suitable choice. It is, of course, necessary

to keep the different breeds absolutely separate to mix the strains would be to spoil the pedigree stock.

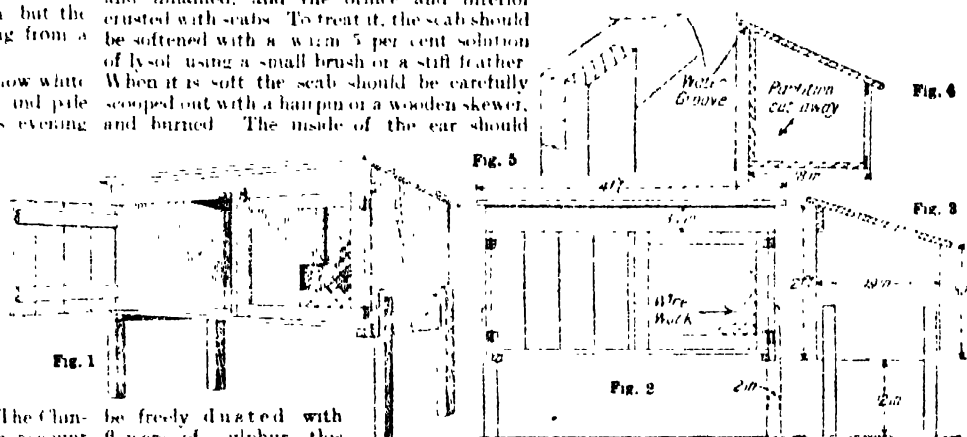
Pedigree fur rabbits should be bred from three times a year, after the age of 7 months, preferably from January to July. The youngsters should be in full adult fur at from 5 to 7 months old, and must then be watched very carefully and caught at the right moment for killing, i.e. when the fur is fully through and before there is the slightest sign of the impending moult. Good pedigree stock can usually be obtained at prices ranging from 10s. for a promising youngster to as many guineas for a prize winning adult, from reliable breeders. A start may be made with a buck and 2 to 6 does of the same breed, according to the accommodation available. Each must be housed in a separate hutch from the age of 11 or 12 weeks onward until old enough to breed from or for killing, as if run on together they fight or soil each other's fur, which spoils it for selling purposes.

Diseases of Rabbits. Canker of the ear is caused by an itch mite burrowing in the skin. Its symptoms show the base of the ear hot and inflamed, and the outside and interior crusted with scabs. To treat it, the scab should be softened with a warm 5 per cent solution of lysol, using a small brush or a stiff feather. When it is soft the scab should be carefully scooped out with a hairpin or a wooden skewer, and burned. The inside of the ear should

restrict the amount of food to very little. The food given should be good and nourishing, with a high content of oil, for example, carrots, cloves, linseed, hemp, lucerne, sunflower seed and linseed oil in a mash. When it is due to mites, the complaint can be cured by anointing the bald patches with petroleum or linseed oil. The best cure, however, is to bathe the animal in a 2 or 3 per cent solution of lysol, afterwards rubbing it dry and placing it in a warm spot away from the draughts. Care should be taken to avoid getting any lysol in the animal's eyes, while the hutch must be thoroughly cleaned and disinfected.

Rickets, evidenced by crooked forelegs and an irregular gait, is usually inherited. It may, however, be accentuated by giving the animal an undue proportion of food that lacks lime salts, potatoes and roots, for instance. To cure it is impossible, but it may be prevented by frequent changes of food and putting some salt in the mash. A small saltspoonful of calcium phosphate, two or three times a week, is also helpful.

Rabbit Hutches. The hutch should be located in a dry place under shelter; it should be large



Rabbit Hutch. Fig. 1, Small and easily constructed hutch, with two compartments. Figs. 2 and 3, Front and side elevations. Fig. 4, Section showing cut in partition. Fig. 5, Corner joint of framed door.

be freely dusted with flowers of sulphur, this treatment being repeated after 4 or 5 days. If the animal continues to hold its head on one side it means that the ear drum has been pierced. In this case the disease will probably be fatal, so the rabbit had better be killed at once.

An itch mite in the skin is also responsible for the complaint known as scab. In this a scaly scab is seen on the nose, eyelids, lips, forehead, or the base of the ears; later it spreads over the body. In the early stages the skin is inflamed and scaly, and small red pimples form. The hair falls out and the animals scratch themselves a good deal. To cure it, the hair should be cut off. The scab should be thoroughly softened with soft soap, washed off with a warm 2 per cent solution of lysol, using a stiff brush, and anointed every day with one part of Peruvian balsam in one part of the spirit. Daily painting with tincture of iodine is recommended, but care must be taken to avoid the eyes.

Some rabbits suffer from inflammation of the eyes. In these cases the eyes are red, with a tendency to water. The eyelids stick together and discharge matter. The trouble may arise from draughts, dirty or damp hutches or injuries and scratches. The eyes should be washed with camomile tea and 2 per cent boracic acid.

Other rabbits suffer from loss of hair, this taking the form of bald patches on the coat. It may be caused by a weakening of the hair follicles through poverty of blood or nervous trouble; or it may be due to hair knives which are seen as small white spots, especially on the flank, chest and tail. When it is due to a weakening of the hair follicles, the cure is to

enough for its inhabitants, and it should be so arranged as to admit of being cleaned quickly and easily. The hutch, moreover, should be ready before any stock is bought. With the exception of the hay rack, there need be no internal features of any kind in it. Partitions are not necessary, since movable nesting boxes can be used in their place. Outdoor hutches should stand on tarred bricks. They should always be arranged to face a wall or hedge, or some other object that will give shelter from the wind.

Two kinds of hutches may be used, one being at least 4 ft. and the other 3 ft. long. Both kinds should be about 3 ft. deep, from back to front, and about 18 or 20 in. high. The large hutches are used for breeding does and their progeny; the smaller ones for stud bucks, resting does and growing youngsters. If rabbits are kept in any number there should be about three large hutches to every two small ones.

For the need of those who only keep rabbits on a small scale, a strong and easily constructed hutch is shown in Fig. 1. It has two compartments and is sufficiently roomy for breeding purposes. Figs. 2 and 3 show the front and side elevations, and other details are given in Figs. 4 and 5.

The sides should be made first, they are 24 in. high in front, 18 in. at the back, 10 in. wide, and formed from 1-in. boards. Unless the wood is glued up to provide a piece of the required width, and this will mean very careful planing, tongued and grooved matchboarding should be fitted together to form the correct

width when the outer tongue and groove have been removed. A 1-in. square fillet should be nailed or screwed across the bottom and a 2-in. by $\frac{1}{2}$ -in. length secured in the same way across the top; the latter piece should be fastened on before the top is trimmed to the correct slope. The two ends are joined by the flooring at the bottom, suitable $\frac{1}{2}$ -in. boards to a width of 18 $\frac{1}{2}$ in. being nailed to the bottom fillets to give a length of 42 $\frac{1}{2}$ in. between the sides. At the top (front) a 44-in. by 3 $\frac{1}{2}$ -in. by $\frac{1}{2}$ in. length is let in as shown, and a similar length should be let into the sloping top so that the outer edge is $\frac{1}{2}$ in. away from the back.

The middle partition is fitted in position, suitable slots being cut to allow for the top pieces, and an opening must be cut at the bottom back corner; this should be about 6 in. or so square. A horizontal batten can be fastened to the partition on a level with the edge of the opening. The back is nailed on direct to the bottom boards and the top piece, and nails driven in from the ends as well as into the partition. The solid door is of tongued matching nailed to lengths of 3 in. by 1 in. wood, and carefully fitted in the space; either cross grained or ordinary back flap hinges, as shown, can be used to hinge the door. The wire covered framed door is made from 2 in. by 1 in. wood, either halved at the corners, or preferably, joined with the mortise and tenon joint.

Securing the Wire Netting

The frame should be covered with stout wire netting on the inside, but the ends of the netting should be turned in neatly and secured with wire staples. The four legs or supports are cut from 2 in. square material and notched out at the top half way through, allowing a distance of 12 in. below and from 6 in. to 8 in. above the notch. These pieces are screwed on to the ends a short distance from the edges. The roof is composed of pieces of match boarding 4 ft. long joined together to project about 2 in. in front and at the back. A groove to prevent the water running from the roof into the interior should be planed or cut with a gouge. Another method of forming it is to plane a V-shaped cut with a rebate plane.

A good way of housing a number of rabbits is to have a stack of hutches one above the other. These can be made on the lines suggested, but for protection against the weather it may be well to coat the whole of the wood work with creosote. The floors can be water proofed by melting some pitch in an old saucepan, adding about a table-spoonful of turpentine to every lb. of pitch, and basting all the cracks and crevices of the floor with the hot mixture. The whole should then be treated with a hot flat iron to work the pitch well into the wood. The floor should be strewn with sand, which may be thoroughly incorporated in the pitch by the aid of a blow lamp. Great care should be exercised in melting the pitch, and the job is best done out of doors.

RABBIT MEAT. Boiling or stewing are the most usual methods of cooking a rabbit, but it can be roasted, baked, or made into soup or pies. When buying rabbits select those that are plump and free from discoloration, and pay attention to the ears, claws, and teeth. The ears should tear easily, the claws be smooth and sharp, and the teeth small.

Unlike hares, rabbits should be skinned immediately after they are killed, the stomach and intestines being removed, and the inside thoroughly cleaned. If the rabbit is not to be cooked at once, hang it up until it is required, then remove the ears and cut off the legs at the first joint, skin it, and remove the eyes. This is usually done by the poulterer if the rabbit is bought from a shop.

The kidneys and the fat that surrounds them should next be taken out, the diaphragm broken, and the heart and lungs drawn. The liver, heart, and kidneys only should be

reserved. Wash the rabbit well in two or three bowls of cold salted water, then let it soak for about $\frac{1}{2}$ hour in some salted tepid water.

Only young rabbits should be roasted or baked, the older ones being better suited to stewing. Simmer the liver, heart, and kidneys in salted water. When tender chop them finely and add them to some veal forcemeat (see page 477). Stuff the rabbit with the forcemeat, sew up the opening, and truss with the fore-legs backward, the hindlegs forward, and the head in an upright position. Tie a piece of fat bacon over the back, then put the rabbit into a tin with some dripping, and cook it in a moderate oven.

Baste it frequently, and when it is almost done take off the bacon, dredge the rabbit with flour, baste it again, and let it brown. Serve it on a hot dish after removing the string and skewers, pour some thickened brown gravy round it, and serve more of the latter separately in a hot tureen; $\frac{1}{2}$ hour to 1 hour is the time required for roasting. Red currant or rowanberry jelly, forcemeat balls, and rolls of bacon may be used as a garnish.

The dish called jugged rabbit is prepared in the same way as jugged hare. For boiling first prepare the rabbit as directed. Truss it neatly, put it into a stewpan with enough white stock or water to cover it, and add 2 peeled and sliced onions, a bunch of parsley and herbbed together, 4 cloves and the same number of peppercorns, and a little salt.

Bring the whole to the boil then simmer well and let it simmer gently for 1-2 hours, according to the age and size of the rabbit. When it is tender lift it out of the pan, remove the string, and put the rabbit on to a hot dish, pouring over it some onion or parsley sauce. Some neat rolls of roasted bacon should be used as a garnish.

Casserole of Rabbit. Draw and clean a rabbit, cut it into neat joints, and leave these to soak for about $\frac{1}{2}$ hour. Then dry them and put them into a pan containing 1 oz. hot melted dripping, adding also a chopped onion. When the rabbit is browned, take it out and add 1 oz. flour to the fat in the pan. Brown that also, then pour in 1 $\frac{1}{2}$ pints stock, and stir the sauce until it boils.

Into a casserole put alternate layers of rabbit and thick slices of peeled and parboiled potato, using about $\frac{1}{2}$ lb. of the latter. Add a small bunch of herbs and seasoning to taste, then pour in the sauce. Put another $\frac{1}{2}$ lb. thickly sliced potatoes on top, cover the casserole, and cook its contents in a moderate oven for about 1 $\frac{1}{2}$ hours, or until the meat is tender. Then take out the herbs and serve the whole in the casserole, using a few rolls of lightly fried bacon as a garnish.

Rabbits also make excellent curries, fricassées and quenelles. Recipes for these three methods will be found under the general headings, Curry, Fricassée and Quenelle in this work. Cold cooked rabbit can be used as a filling for patties by mixing 4 table-spoonfuls chopped rabbit with 1 gill white sauce. Add chopped parsley and seasoning to taste.

Rabbit Stew. To stew a rabbit, cut it, after soaking, into neat pieces. Fry them lightly with an onion as for casserole of rabbit, and put the pieces in a stew-jar. Add the flour and stock to the fat in the pan, and when smooth add two sliced carrots and a diced turnip. Boil up, add $\frac{1}{2}$ lb. belly pork cut in small pieces, simmer for a few minutes, then add to the rabbit in the stew jar. Season well, and stew gently for 1 $\frac{1}{2}$ to 2 hours.

Another excellent way of cooking rabbit is to stew it in milk. Put it in a pan with enough milk or milk and water to cover it, add an onion, a blade of mace, a bay leaf, and pepper and salt to taste, and stew it gently until it is tender. Then take out the rabbit, place it on a hot dish, and pour over it some thickened

gravy. Fried rolls of bacon should garnish this dish of stewed rabbit.

Rabbit Pie. To make a rabbit pie cut a prepared rabbit into joints of a convenient size, and coat them with flour. Then mix them in a pan with $\frac{1}{2}$ lb. bacon cut into small pieces, 2 table-spoonfuls chopped parsley, the grated rind of half a lemon, and seasoning to taste.

Put the mixture fairly high in the centre point in enough good brown stock to make the dish three parts full and season the sides with some small forcemeat balls. Cover the pie with rough puff pastry or short crust (see Pastry), leaving a hole in the top and bake it in a hot oven until the rabbit is cooked and the pastry lightly browned.

Rabbit Soup. To prepare a rabbit soup, cut up the remains of a cooked rabbit, dipping the pieces in flour. Melt a lump of dripping in a saucepan and lightly fry the rabbit in it, together with a chopped onion. Pour in a pint of water and bring the whole to the boil, skimming it well. Slice a fairly large carrot, and add it with a bouquet garni to the soup. Simmer the latter for 2 hours, then strain and thicken it with 1 oz. flour mixed with any good brown sauce. Cook the soup for a further 5 min., and season it well before serving.

RABBIT WOOL. The soft, fluffy wool manufactured from the hair of the Angora rabbit is popularly known as rabbit wool. Because of its silky texture it is employed in white or a pale colour to make ladies' knitted and crocheted caps, and it is used extensively as an edging for knitted coats and frocks. Garments made to a rabbit wool should be washed in warm, not boiling, soapy water, squeezed, not wrung out, and laid on a cloth to dry in the air.

RABIES: In Dogs. The disease known as hydrophobia when it affects human beings is called rabies in animals. The most common animal affected of these are dogs, but it is not almost every warm-blooded animal is susceptible to the poison of rabies. The dog is the chief propagator of the disease.

Rabies practically no longer exists in Great Britain, having been banished by the stringent order and other sanitary measures. At present, however, and this renders necessary the enforcement of quarantine with regard to imported dogs.

The first signs of rabies in a dog are as follows. He becomes sullen and fidgety, he has a suspicious look in his eyes, and continually licks the injured part through which he has been infected. If his ear has been bitten, he scratches it without cessation. Occasionally he vomits, and very often eats such things as straw, grass, pieces of cloth, or carpet, etc.

The madness develops rapidly, and in the next stage the dog becomes exceedingly bad-tempered. It is not safe for even his master to go near him. He attacks other dogs, bites at strangers, destroys his bed, and if he is chained up, gnaws the wood of his kennel. About the second day of the disease a large quantity of saliva flows from the dog's mouth. This continues for only 8 or 10 hours, and then the animal suffers from insatiable thirst. Unlike a human being suffering from hydrophobia, a rabid dog has no difficulty in swallowing, and therefore he has no dread of water. The rabid dog drinks constantly, but in many cases paralysis of the jaw muscles sets in. This may quickly extend to the body and limbs, and the animal then staggers or falls. If he barks the bark is hoarse and unnatural. About the fourth, fifth, or sixth day death comes, sometimes with convulsions, but more often without a struggle.

If any one has been bitten by a dog, the animal should on no account be killed, but should be confined and observed. If the dog

appears to be rabid the bitten person should undergo the Pasteur preventive treatment of hydrophobia. The animal is killed, and its spinal cord, packed in glycerin, accompanies the patient to the hospital. See Dog; Hydrophobia; Quarantine.

RACE GAME. Games of this type exist in great variety and new ones are constantly appearing. The principle of all is the same. A piece of cardboard is marked for the course, and on it miniature horses, cars, trams, or other means of progress, are placed, one for each of the players. The latter are provided with dice, and each moves his piece according to the number of his throw.

In some of these games obstacles are marked, and if a player, instead of passing over one of these, just reaches it, he is penalized by having to go back a certain distance, or by missing a throw, or throws.

RACQUET. This implement is used in several ball games, notably lawn tennis, while the battledore is in origin the same. In selecting a tennis racquet it is essential to choose one that feels thoroughly comfortable when swung in the hand. This is the main consideration; others are weight, balance, the size of the handle, and the nature of the gut. See Badminton; Lawn Tennis.

RADIATOR: In Heating. In the home the term radiator is used to denote a heating element, such as a gas fire or an electric heater, but by far the most frequent use, though scientifically incorrect, is to denote the multitubular unit in a central heating system from which the heat is dissipated into the room. Actually the heat from such a unit is convected, and not directly radiated to any extent. However, radiator is the accepted trade term for this type of heating unit.

The most common form of radiator consists of a series of cast iron loops, or pipes, through which the heated fluid passes. This fluid may be hot water, steam, or hot air. In most domestic central heating systems the heating fluid is low-pressure hot water. With separate gas-heated radiator units steam or hot air is employed. See Boiler; Central Heating; Electricity; Gas; Heating; Hot Water Supply.

RADIATOR: On Motor Cars. A radiator is an important part of the internal combustion engine. Considerable heat is generated in the cylinder walls by the firing of the compressed gases on the explosion stroke, these explosions occurring at from about 200 to 2,000 a minute.

Rising in proportion to engine speed, a very high temperature is reached, and, unless a suitable means is provided by which to cool the cylinders, the walls would be made red hot, and the pistons would seize or even melt, if of aluminum. With air-cooled engines the temperature is kept within reasonable limits by providing the outside of the cylinder with an (at least integral with the cylinder block), by means of which the heat generated is the more quickly drawn off and dissipated to the air. In the water-cooled system the radiator is

used to cool the water after it has flowed round the cylinders, and before it again passes to the cylinder jackets, where the water once more becomes heated up before flowing to the radiator. The cycle of operation continues either by the thermo-siphon or pump system, so long as the engine is running. Beyond occasionally replenishing the radiator with water, the system requires no attention. Only soft water, such as rain water, should be used, otherwise the whole of the system will, sooner or later, become coated with a deposit similar to that on the inside of a kettle, which will seriously interfere with its efficiency.

The radiator and water passages must be so designed that free circulation is obtained, and the water temperature does not exceed 212° F., that is boiling point at atmospheric pressure. Boiling may cause trouble in several ways. Steam locks may cause a burst, and at frequent intervals it will be necessary to fill up to replace the loss caused by evaporation and splashing over. In the latter case, the loss may cause the water to fall to a level at which the circulation, if by thermo-siphon, will cease to function.

Should this happen, it may be unsafe to fill up with stone cold water, because its sudden contact with the excessively hot cylinders may quite easily cause the metal to crack. Further, if all the water has boiled away the heat of the cylinders will be such as to cause the fresh water to boil the instant it is put in, with the risk that a serious explosion will result. The only safe course to adopt in this case is to allow the engine at least an hour in which to cool down.

The efficiency of the radiator is dependent upon the speed at which air passes through its interstices, which in turn is governed by the wind and road speed of the vehicle, i.e. as the engine speed rises, so will the road speed increase, presuming the car is in top gear, thereby increasing the air pressure on the radiator. This cools the water more quickly, but since the engine speed will often be very high in relation to the road speed, as when climbing a hill in a low gear, it is common practice to fit a suction fan, driven off the engine, behind the radiator, to ensure as far as possible a draught of air that shall be proportionate to the demands of the engine.

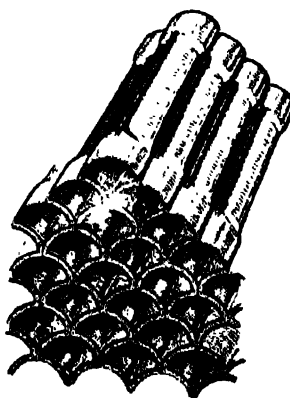
Radiator efficiency depends very considerably also upon climatic temperature, i.e. the radiator that is efficient in very hot weather will be too efficient in cold weather. In these circumstances, the fan, if fitted, should be disconnected, or a part of the radiator screened off. If this is not done the petrol consumption will be excessive, owing to the fact that the thermal efficiency of the engine will be too low. In other words, at a given road speed a wider throttle opening will be called for than would be needed during the summer months. From the foregoing it will be seen that over-efficiency can be easily remedied, whereas over-heating of the engine, caused by too small a radiator, cannot be cured, except by the fitting of a larger one, which will be found a costly business.

There are two main types of radiator—the

gilled tube pattern and the honeycomb. The former is the least costly to construct, but each tube must be of a fairly strong section of about $\frac{1}{2}$ in. inside diameter to be of sufficient strength to support itself. Consequently, the volume of water contained will amount to a fair quantity, and, owing to the fact that the cooling power of the gilled tube is less than the honeycomb pattern, a greater volume of water has to be carried by all radiators of the former class.

Fig. 1 shows in detail the method of construction of the gilled tube radiator, from which it will be seen that there are only two points that are likely to leak, namely, the top and bottom junction of the tubes with the body of the radiator, discounting the rest of the radiator that is common to both types. The tubes are arranged in vertical rows, those in the second row standing behind the gaps in the first, and so on.

The honeycomb radiator is constructed on entirely different lines. There are two forms, the original tubular one, as shown in Fig. 2, and another in which shaped plates are used as the components (Fig. 3). In the original type the tubes are used in short lengths, arranged horizontally across the body of the radiator, the ends being left open so that the air can pass through the tubes instead of round the outside, as is the case with the gilled tube pattern just described. The tubes are all shaped at each end in the form of a hexagon, making them similar in appearance to the



Radiator. Fig. 3. Portion of a honeycomb type radiator, built up on the Galloway principle.

double-ended box-spanner. The ends of the tubes are slightly larger in diameter than the remaining portion; therefore, when the tubes are packed closely so that the flats of the hexagons fit up together, a space is left between the round portion of the tubes, and it is between these spaces that the water flows.

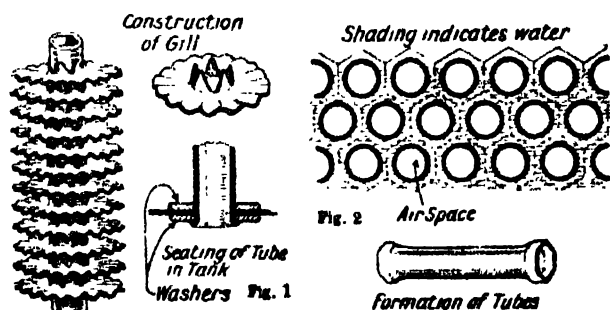
All the tubes are held together by soldering, one method being to immerse to a depth of about $\frac{1}{4}$ in. the hexagon faces of the block of tubes.

With the thermo-siphon system the height of the radiator in relation to the engine is of considerable importance. On no account should the bottom of the radiator be more than a little if any below the level of the cylinder water jacket. This is very important, because, as is well known, cold water will not rise. Owing to the lay-out of the chassis this feature cannot always be observed, and in such cases a water pump is installed to ensure a proper flow.

The repair of the gilled-tube radiator is a simple soldering job, but the repair of the honeycomb type is far more difficult. A temporary repair can be made by securing a plate coated with red lead over the leak, holding it in position by a long bolt passed through one of the tubes and screwed up tightly. See Motor Car.

Radio. See Broadcast Receiving Set; Portable Radio Set; Wireless.

RADISH. This popular salad vegetable is grown for its red or white roots, which may be long, round or oval. The quality depends largely on the rate of growth, therefore seeds should be sown on rich, friable soil to ensure rapid development. Successive sowings may be made out of doors from February to August. The earliest sowings should be on a sheltered border, and during summer a slightly shady place is most suitable; seeds are sown in shallow drills 8 inches apart. Radishes should be pulled while the roots are young.



Radiator on Motor Cars. Fig. 1. Diagram showing construction of a gilled tube radiator. Fig. 2. Section through honeycomb radiator.

For spring sowing the long-rooted varieties are preferred, and the round or oval sorts for sowing in summer.

By sowing seeds on a bed of fine soil on a hotbed in a garden frame in January or early



Radish. An attractive salad vegetable. Those illustrated are the variety known as the turnip radish

February, excellent small roots will be available long before those raised out of doors are ready. The large Black Spanish and Chinese Rose radishes are useful for winter salads; they are raised from seeds sown out of doors in July August. As the plants are vigorous they should be thinned to 6 inches apart.

RADIUM: Medical Uses. The element radium, obtained from pitchblende, emits rays of three sorts: α , or atoms of helium; β , or electrons; and γ , which resemble X rays. When X-rays fall on living tissues they produce irritation. This may only be of such a degree as to stimulate the tissue cells to increased activity, but it may reach a point where the cells are killed. The healthy cells of the body exhibit a greater resistance to irritation than do those composing growths; hence it is possible, by regulating the amount of irritation produced, to kill the abnormal cells without affecting the normal ones.

It requires judgment and experience to accomplish this, because it is clear that if the dosage is not sufficient for the purpose it may actually encourage tumour growth; while if it is excessive, damage may be done to the healthy tissues.

Another method of radium application involves the exposure of deep-seated disease by surgical operation, and the insertion of radium, enclosed in tubes, into the tumour. The radium tubes are removed after a certain interval of time. From this originated interstitial radium needling of malignant tumours. Radium packed into body cavities (e.g. the uterus, maxillary antrum, etc.) led to marked success in the treatment of disease in these regions. The effects are due almost entirely to the gamma rays of radium. As a rule, the greater the malignancy of the tumour the more sensitive it is to the action of these rays.

In internal medicine, radium is useful in some blood diseases, e.g. leukaemia; and in conditions such as Hodgkin's disease, lymphosarcoma, and generalised carcinomatosis, radium treatment gives relief. Some acute and chronic inflammatory diseases and many forms of skin disease can be treated.

Radium rays have a selective action on cells undergoing active and rapid division, such cells, which compose the cancer growth, being destroyed by doses of radiation smaller than those harmful to normal cells.

Drinking water containing radium emanations is said to have proved markedly beneficial in rheumatoid arthritis, a disease which often shows little response to other forms of treatment. The waters at Bath, Droitwich, and other spas are radio-active, and it is probable that the benefit derived from them is due to radio activity.

RAFFIA: For the Garden. This consists of strips of thin fibre of the inner bark or leaves of the raffia palm, native to Madagascar. It is very useful for tying plants, and it is easier to use if moistened first. Raffia is used also in embroidery (especially when dyed), and in kindergarten manual training. Coarser fibres are used in weaving light baskets and mats, etc. See article below.

RAFFIA WORK: EMBROIDERY AND WEAVING

Methods of Decorating Useful Articles with this Fibre

Some ideas are here given of the wide possibilities of this work which can easily be varied or elaborated. See Colour Plate facing p. 974. Also the entries Braid Basket, Embroidery; Hairpin Work, Rush Work, Wastepaper Basket, Work Basket.

Strands of raffia are woven into mats, baskets, hats, and other articles. They are also used for embroidery, and for making motifs which may be applied as trimmings. In its natural colour, which is similar to that of straw, raffia can be bought from the florist, and then dyed to the desired shade; but it is sold ready dyed in a wide range of colours at handicraft stores and in most art work departments in big shops, together with raffia varnish, special canvas, needles, and raffia cloth.

If dyeing is done at home, the raffia should first be soaked in warm water for an hour. This makes it more pliable, and enables it to take the dye more easily than would otherwise be possible. Almost any kind of dye used for household purposes is suitable, but dye, applied with the brush with which it is usually sold, giving particularly good results. When a brush is used, the dye is best applied to the finished article, not to the unwoven strands of raffia, for the latter would be a tedious process, and an even effect difficult to obtain.

Raffia Embroidery. The most suitable trimming for rush baskets, mats, hats, and garden cushions is embroidery in raffia. It is equally useful for table mats in American cloth, and raffia cloth, and for tea cosies with

canvas foundations. Sometimes beads are used, and also wools, in order to enhance the effect; sometimes the embroidery completely covers the surface, as in the tea cosy illustrated (Fig. 1), or it is used only to form a border, as in the American cloth tea-trolley mat (Fig. 2).

When embroidering with this fibre, select designs that are suitable. Conventional or geometrical patterns are best. Natural raffia should be soaked in warm water and allowed to dry for a few hours before working. Dyed raffia, having been already soaked, does not require dampening unless it feels brittle to the touch. Designs can be traced on canvas or raffia cloth over carbon paper. When the embroidery is meant to be flat, a warm iron can be pressed over a damp cloth on the back of the work when finished. Satin, blanket, lazy-daisy, and stem stitch (see Embroidery) are the stitches most suitable for working the fibre, and special needles are sold for use with raffia, or crewel needles can be used for finer work. Raffia strands are split into narrower threads when the embroidery demands it.

A stiff canvas is preferable to a soft one, and the mesh must be large enough to take the raffia strands. Rug canvas is suitable

for large pieces of work. Special raffia canvas has only a single thread mesh. Broad strands of raffia cover backgrounds best. Raffia cloth is a pleasant fabric for garden cushions and cosies, and is very useful for covering such things as blotters and book-ends to be embroidered with designs in raffia. It is always advisable to strengthen the back of this cloth with thin muslin or canvas before embroidering. The edges of a large piece of work such as a cushion cover should be tacked between strips of muslin to prevent fraying whilst embroidering. The raffia cloth is obtainable both natural and dyed, and in three qualities: fine, medium, and coarse.

Wooden book-ends covered with raffia work make a charming gift or add a decorative note to a table. A blotter or writing pad can easily be made to match, using raffia cloth over a cardboard foundation lined with shot taffeta and finished with gold galon. Raffia cloth covers for bridge-markers are also decorative, and pochettes can be made from this material, or of canvas embroidered with designs in coloured raffia.

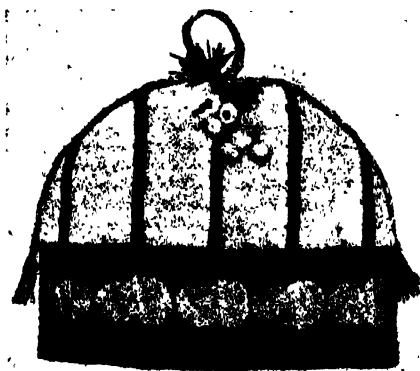
For the tea cosy (Fig. 1) a piece of canvas 16 in. by 22 in. is required. The width of the cosy at the bottom should be 13 in. and the depth should be 9½ in. Make the outline 1 in. larger than the finished article, to allow for shrinking in working.

The simple design of apples and leaves can be copied freehand on to paper and transferred by means of carbon paper. Alternatively, any fruit border transfer of suitable size (about 3 inches wide) can be used. Begin by working a straight edge of bright blue raffia over two holes and then a row of black. Fill in the background round the fruit with the blue. The apples are worked in yellow and two shades of orange. The leaves are filled in with green, working from centre to edge in satin stitch. Above the border a row of black is worked.

The rest of the design is filled in as follows. Work a vertical line in black exactly in the centre of the cosy. Work over 2 holes. Then work a similar line on either side 2 in. from the centre, and another at a similar distance. Fill in the spaces between, using a series of vertical stitches over 4 holes, then over 5 holes. Continue in this manner until the whole of the cosy is filled in. Then work the other side in the same way.

When finished, place the two sides face to face, and machine together, turn right side out, make a plait of black and white raffia, and stitch this round the join, making a loop at the top for a handle. The ends of the plait should be knotted, leaving the raffia loose to form a tassel. Split this up very finely to simulate silk.

Wrap some large wooden beads with orange raffia, by passing the needle through the hole and over the bead. Thread a needle with a



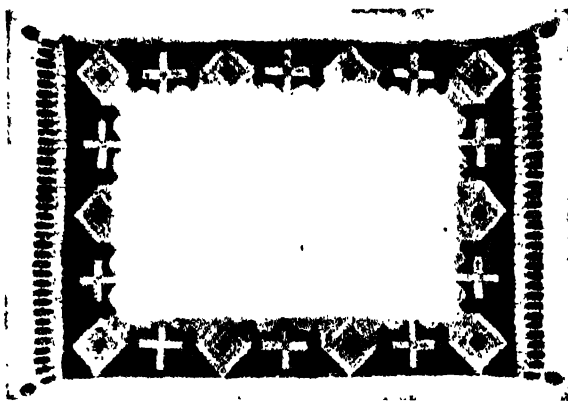
Raffia. Fig. 1. Tea cosy embroidered in natural, black, yellow, blue, and orange raffia on coarse canvas, and lined with deep blue satcen

strand of green raffia pass it through the wooden bead, thread a small black bead on to it, pass back to make the stalk, leaving the black bead as a finish to the base of the large bead. Make 6 berries in this way, tie them securely together with some green raffia and stitch this at the base of the handle. Pad the cosy with layers of cotton wool wadding and line it with blue sateen to match the blue raffia used for the border. Raffia cloth may be used instead of covering the canvas with raffia embroidery. The border and finishing would be worked in the same way and $\frac{1}{2}$ yd of the raffia fabric would be required.

Luncheon mats for garden or loggia table use and tray cloths for service trolleys are most practical when made of almond green American cloth with an applied canvas border embroidered in raffia and with coloured beads at the ends. The trolley mat illustrated in Fig. 2 should measure 18 in. by 12 in. (without the beaded ends). Cut the American cloth to this size, place a piece of canvas under it and cut $\frac{1}{2}$ in. larger all round. Trace or draw the geometrical design on the canvas and embroider in brightly coloured raffia, using black for the outer edge. Leave half inch of canvas for turning. A larger-eyed needle should be used.

When the border has been worked, cut out the inside of the canvas and catch down the embroidery to the American cloth with a fine needle and silk. Turn the edge of the canvas over that of the American cloth and buttonhole round both with black raffia. Buy or make a fringe of wooden beads to match the colours of the embroidery. Attach this to the raffia buttonholing at each end and finish off the two sides of fringe by using a large black bead and a small coloured one.

board through the centre opening, taking care to overlap the strands each time so that the cardboard does not show through. Near the end of each strand, thread it with a sharp pointed crewel needle and take it through the cardboard and make firm by pushing the end beneath the already wound raffia strands. Continue winding till the cardboard shape is covered. Two or three strands may be used together to cover the cardboard more quickly.



Raffia. Fig. 2. Mat for a tea trolley made of green American cloth with an applied geometrical design worked in coloured raffia on canvas.

The edge (see diagram B) is worked by threading the needle with a contrasting shade of raffia and using a running stitch. Bring the needle up through the cardboard each time, then reverse the mat and bring the needle up through the same holes so that the stitches cross.

The centre weaving is begun by taking a strand of the same coloured raffia as used for the edge straight across the opening, threading through the cardboard on the other side and bringing the strand back to the other side of the opening to give a double thickness. Fasten off and repeat round the opening, eight strands should be sufficient for a small mat (see Fig. 3, C).

Now weave in and out of these strands from the centre for about 1 in. in diameter. Make a row of knots all round close up to this weaving, one on each strand, and then a second row of knots, leaving a small space between them and the weaving. Detail for the knots is shown in Fig. 3, D. More elaborate borders can be made to such mats introducing several colours with fancy stitches. An example of weaving with raffia on a cane foundation is given in the article on Broad Basket, page 138.

A platted raffia basket is illustrated in Fig. 4. Rush may be used instead of raffia and instructions for making the plat, which can be equally well used for raffia, are given in the article on rushwork. The five-way plat with five strands is particularly good for the purpose. Start at the bottom, making a small flat mat by sewing the plat together with raffia of the same colour. The base should be about 9 in. in diameter. Make a circle of plat exactly the same size, and build this up to form the sides of the basket, which should measure 5 to 6 in. high. Fasten it off by stitching the end of the plat inside, arranging it so that the edge is even. Sew this part firmly to the base, then take two plats, and twist them to form a handle. The two ends must be firmly stitched inside the basket, one being sewn where the side

was finished off. The raffia flowers are embroidered on to the basket direct, using a long needle. Pink, mauve and fuchsia shades are always pretty if the lining of the basket is chosen to match one of these colours. Make a few rather short loop stitches for the centre of each flower, and round these make long loop stitches of a contrasting colour for the petals. The less raffia is handled the better the result. For the stems twist a little green raffia round a piece of string or piping cord, stitching it here and there to hold it in place. One or two pockets should be made in the silk or sateen lining of the basket, and a cover can be made by cutting the lining sufficiently deep to meet over the top when drawn up by a slotted ribbon. A small bunch of flowers provides a pretty finish at each end of the handle, or beads may be used as explained in Fig. 1.

Applied Raffia Trimming. Flowers or fruit may be worked separately like the spray shown in Fig. 5. These are effective for trimming beach or garden hats, for ornamenting fruit, bread or wastepaper baskets. A piece of canvas larger than the spray required is used to work on. Sketch the design and fill in with the coloured raffia strands, using long buttonhole stitches from centre to edge. Use green for stalks and leaves. The centres of the flowers are of beads. Cut away the superfluous canvas from the spray when the embroidery is finished.

RAFFLE. The selling of an article by lottery. It is legal only when held in connexion with some fête, or limited to certain persons, e.g. members of one society or club. The proceeds of the raffle, after deduction for prizes and expenses, must not be for private gain; no prize may be monetary; tickets must not be resold; the result of the raffle must not be announced except on the premises where it was drawn, or in a list issued to those taking part.

RAFTER. A rafter is a support for the roof of a building, particularly those members running upwards from the wall plate to the ridge board. Rafters are generally made of timber, although metal is occasionally employed. The size most commonly used for a house is 4 in. deep and 2 in. wide, placed not more than 14 in. apart. The dimensions of the rafters should be in accordance with the following table, in which the first column gives the distance between two points of support and the second column gives the respective depth and breadth of the rafters. The sizes given are those in commercial use and approximately the size of the material as it leaves the saw.

Length of bearing not exceeding	Dimensions in inches
5 ft.	3 by 2
6	3½ by 2
7	4 by 2
8	4½ by 2
9	5 by 2

Rafters are practically always put in one continuous piece. They are generally notched

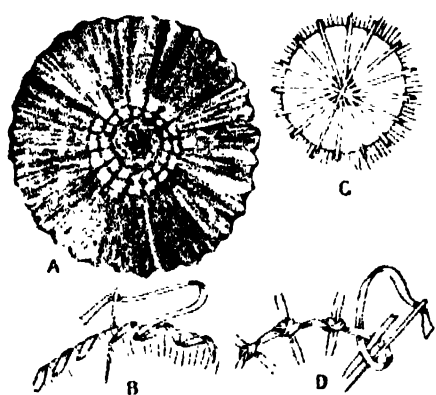


Fig. 3. A, mat made of coloured raffia strands wound over a cardboard foundation and woven in the centre. B, edge worked with running stitch. C, method of placing strands for central weaving. D, details of knotting.

Weaving and Plating. Other effective uses for raffia consist of weaving and plating the strands to make baskets, mats, hats, and other articles. Table mats are extremely simple to make in this manner. Oval and round cardboard foundations may be purchased or a set may be cut from a strong sheet of cardboard (imperial size). Six round mats 7 in. in diameter, 2 oval dish mats 9 in. by 6 in. and one large oval 11 in. by 9 in. make a set. For a 7 in. mat (see Fig. 3) a centre should be cut out in the cardboard of 2½ in. for the ovals cut out an opening in proportion. The raffia is simply bound over the card



Fig. 4. Work basket in platted raffia embroidered with raffia flowers. Fig. 5. Raffia flowers suitable for an applied trimming to a wastepaper basket or garden hat.

to fit on to the plate, which is the timber on the top of the wall, and are cut at an angle at the opposite end, so that they bear against the ridge board or other point of support. They are usually supported in the middle of their span by a long, horizontally disposed timber known as a purlin. They are prevented from sliding outward by means of collars, horizontal timbers fixed between opposite pairs of rafters and have to resist heavy tensile strains.

A serviceable method of fixing small rafters is illustrated in Figs. 1-2, which show how the rafter is fitted to a single or lean to roof. At the upper end the rafter bears against the



single wall plate, and at the lower end it is bird mouthed or notched to the wall plate (Fig. 2), both ends being secured to these two plates by means of steel nails. The same method is adopted in the case of a span roof and the construction answers all requirements for any kind of roof that the amateur craftsman is likely to undertake. The correct angles are obtained by the use of a bevel square and by accurate measurements. The best plan is to cut one of the rafters to fit perfectly and then use it as a pattern. See Ceiling, Eaves Gutter, House, Roof, etc.

RAGGED ROBIN. This is the common name of a familiar wild plant (*Lychnis floerula*). Two varieties are worth growing in gardens, *alba*, white, and *rubra plena*, with double rose coloured blooms. They grow about 18 in. high and thrive best in moist soil.

RAGOÛT. This term is applied to certain rich meat stews, generally brown in colour and flavoured with vegetables and herbs.

For beef ragoût, any of the cheaper cuts, such as steak for stewing, round, etc., may be used. Wipe 1½ lb. beef, cut it into neat pieces about 2 in. square. Heat 2 oz. good dripping in a saucepan, lay in the beef, a few pieces at a time, and fry them quickly till lightly browned on each side. Lift them out on to a plate and stir into the fat 1 oz. flour. Fry this carefully until a rich brown, stir it frequently with a wooden spoon, as flour quickly burns. Pour in 1 pint good stock or, failing that, water and a little of some variety of meat extract.

Stir this sauce until it boils. Add the meat and 2 tablespoonfuls each of carrot, turnip and onion, cut in large cubes, a small bunch of herbs, and 6 allspice. Simmer the ragoût for about an hour, or until the meat is thoroughly tender.

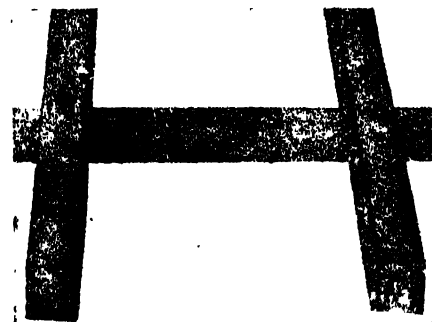
Arrange the pieces of beef in a circle, or some other neat style. Season, skim and strain over the sauce, and put some of the best pieces of the vegetable in the centre, adding, if liked, a few stoned olives heated in the sauce. Other vegetables in season can be added, such as green peas, finely cut French beans, etc. Mutton can be made into a ragoût in the same way, a few tomatoes being used in addition to the other vegetables.

RAGS: Their Uses. Household uses can be found for many kinds of rags. Thus kitchen rags can be made from woollen rags by clipping the cloth into oblongs of uniform size, say 4 by 1 in., and looping these through

a canvas back-cloth, pierced for the purpose. Coloured patterns of a simple sort can be formed, and if rug-making is contemplated it is advisable to save scarlet and other brightly coloured woollen rags for the ornamentation of rugs predominantly of a darker colour. Mop-heads for polishing floors can be made by cutting old blanket into uniform strips and joining the pieces at the centre. Iron-holders and stair-pads are other uses for thick woollen cloth. Linnen and silk rags are valuable for polishing furniture and cotton ones for applying metal-cleaning liquids and pastes.

Too large an accumulation of rags is to be avoided, but by keeping an orderly system of rag-bags, one for one sort and one for another, the household need never be short of kinds suitable for all purposes. See Rug.

RAILING: For House and Garden. A railing is essentially a fence composed of rails or poles, and is used to mark a boundary of one kind or other, or to serve as a protection



Rafter Method of fixing rafters for a simple lean-to roof. Fig. 1. Top end spiked to wall plate. Fig. 2. Feet bird-mouthed to plate.

(e.g. around a basement area, or the well of a staircase, guarded by balusters and handrail).

Borders and open spaces, such as lawns or flower beds, are often provided with light, low railings made of wrought iron, either

in lengths, complete with standards, generally having an inverted U-shaped foot, and have merely to be driven into the ground. The joints between the sections are united by means of bolts passed through holes in the standards.

When erecting railings on a low brickwork wall, one method is first to put up the standards, then the flat top rail, placing the railing bars through the holes in the top rail, plumbing them with the aid of a plumb line, and alining them with a cord stretched between standard and standard and then making the feet secure with strong Portland cement mortar worked up into the form of a capping on the wall.

Another method is to use the standard iron coping, which is generally 9 in. in width and more or less V-shape in cross-section. This is bedded in cement mortar on top of the wall, and provided where necessary with holes for reception of the standards. In some designs of villa railings complete panels of an ornamental pattern are provided, and these are set on the upper and lower rails. A common arrangement is to use cast or wrought iron standards and to hang the gate on them. The standards are generally provided with braces to give them stability, and are set in concrete or stonework. The horizontal members are fixed to the standards, and the whole completed by the addition of the necessary ornamental panels or railing bars. An alternative plan is to build two brick pillars, one on each side of the gate and hang the gate between them. In such cases the horizontal rails are embedded in the brickwork.

To preserve railings they should be painted at frequent intervals, certainly not less than once every three years. The paint used should be of good durable outdoor quality, and before it is applied the railings should be thoroughly well brushed and all traces of rust and dirt removed. The paint should be well brushed into all cracks and crevices as it is here that decay is most likely to occur.

RAILWAYS: MODEL ENGINES & ROLLING STOCK

Practical Advice on Installing and Equipping a Miniature Railroad

This article deals with the selection and operation of clockwork, steam, and electric locomotives, with hints on construction of gauge, trackway, car rails. The electric system described is the third rail. Some model stake current from one of the two running rails. See also Engine, Locomotive.

A model railway built for the private pleasure of its owner and friends may take one of many forms. It may comprise a tiny No. 00 (½-in.) gauge system complete with all sorts of buildings and scenic effects in a space not much larger than an average dining room table. At the other extreme is the railway laid in a park perhaps several miles in extent, constructed to a gauge sufficiently large to serve some useful purpose. Passenger-carrying miniature railways form a popular feature of many pleasure grounds.

For an indoor model railway—a type of line which comes within the scope of this article—the standard gauge of No. 0 (1½-in.) is recommended.

The average tank engine model measures 13 or 13½ in. long over the buffers, and a six-coupled express engine from 15½ to 19½ in. overall length, according to type. A four-wheeled goods wagon is 3½ in. and an average model bogie carriage 13 in. in length. This means that a goods train consisting of a tank engine and ten trucks measures just under 6 ft. in length, allowing for looseness of couplings, and a passenger train of an engine and three coaches will measure at least 5 ft. long. These dimensions will be useful to remember when it comes to planning a model railway to fit a given space.

An attic room can be made to accommodate a system providing reasonably interesting

possibilities in both the construction and the final operation of the line. The minimum curve recommended is 3 ft. radius, but, for the larger types of express engines so often modelled, curves with 4 ft. radius may be used for points and in station yards, with 4 ft. 6 in. to 6 ft. 0 in. radius curves on the main or other fast running lines. Super-elevation of the outer rail need not exceed ¼ in. on the sharpest curve.

Lay-out Plans. The question of the lay out of the track must eventually be determined by the shape of the available site and its overall dimensions. The clockwork engine is more suited to the non-continuous type of plan, but with the electrically driven engine controlled from a point alongside the line it does not very much matter whether or not a circular lay out is adopted. For a steam model a continuous portion of main line is essential, as most models will run for about fifteen to twenty minutes non-stop, and the methods of outside control provided are somewhat primitive.

Where the plan is arranged on a terminus to terminus system a railway operated by clockwork engines should be designed with regard to the length of run to be obtained, with a train load, at a single winding. This length varies from 60 to 100 feet. The distance between the starting and finishing points should therefore be a definite fraction

of—or equal to—the average run of the weakest locomotive used on the system. In this way a model railway can be successfully operated by clockwork locomotives to a time table working without the labour of winding becoming a noticeable factor, so long as several locomotives are available.

Where a long room is available the two main stations may be at the adjacent ends of a non-continuous plan, such as that shown in Fig. 1, the distance between the termini being equal to one half, one third or the total minimum length of run of the clockwork engine. In the case of an electric engine each station and half of the main line can be under the control of a separate operator.

Where the exigencies of the site demand it, the terminals may be placed quite close together, as in Fig. 2, or may be combined as one unit. In the plan illustrated an additional (passing) station—a country roadside station with a simple equipment—is shown in about the middle of the main line. This railway, if electrically controlled, could be worked by either one or two operators, the sections being arranged to suit.

Fig. 3 illustrates a plan much used for all types of locomotives, but particularly suited to the steam engine. The main line is continuous, and at the same time a short-distance or local train may run from terminus A to terminus B, and an express train starting from A may make as many circuits of the continuous track as the signalman at the junction signal box desires before being switched over into terminus B. The order of departure and arrival is reversed on return journey. The terminal stations are comparatively close together and are inside the circle, an advantage where a one-man control is necessary. For electrical control the rails may be divided into three sections. The junction signal box may contain switches for the continuous main line and the junction, and stations A and B can be controlled from their respective signal boxes. The stations may be different in plan. In addition to the passenger platform, terminus A has a locomotive depot, while terminus B may be provided with a goods yard.

Lines on Different Levels. In some cases, to get more features in a given space, the lines are arranged on different levels. For instance, it may be an advantage in the plan shown at Fig. 3 to extend the stations over the top of the continuous main line, which is made to run in a tunnel under the station. This is possible only where a sufficient length is obtainable from the junction where the upper and lower levels meet. The head room required for an over and under crossing is about 5 in. in No. 0 gauge, this dimension allowing for the depth of the track and its supports. This means 2½ in. up and 2½ in. down, and since the maximum gradient should be about 1 in 40, a length of 100 in. is necessary to effect a crossing. It is possible to steepen the grading to 1 in 30 (the length between the level portion and the over and under crossing being 75 in.) where the trains can be rushed down and up the necessary inclines.

Points to Note. Other points to be considered in planning are the following:

(1) If possible always provide a means for the engine to run round its train at an arriving platform or station. (2) Where a train has to shunt into a siding there must always be

enough room beyond the points for the longest train contemplated. (3) A turntable may be used to switch engines into various sidings, taking up much less space than that occupied by points. (4) An oval plan without any straight line is much better than a square plan with short straight lines and curves at the corners. Straight portions are necessary, of course, to accommodate stations. (5) Points to branches leaving the

The made-up tinplate track usually supplied for toy electrical locomotives has an all-level system of rails, and the above remarks do not apply. The standard points and crossings are made in such a manner as to cut out (i.e. render electrically dead) that portion of the running track that is crossed and touched by the collecting shoe on the locomotive, and no short-circuiting can therefore occur. With amateur-built tracks using points of orthodox design some such device as that shown in Fig. 4, B, is necessary.

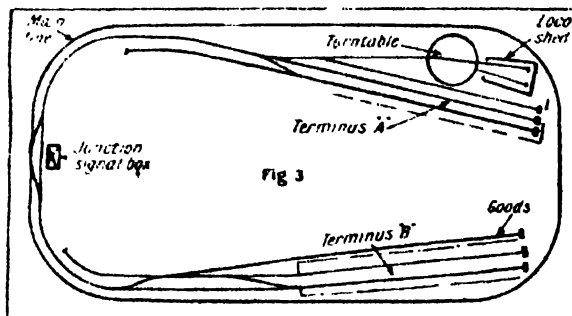
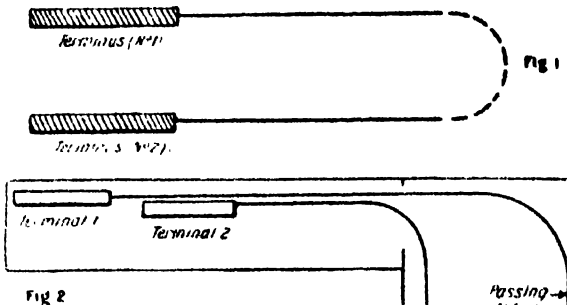
Signal Systems. Signals are used in full-size railway engineering to indicate to the driver the state of the road ahead of him, and also to show the direction in which the points and crossings he may encounter are set for his train.

The semaphore signals are of various patterns and values, including home, distant, and shunting or subsidiary signals. The absolute stop signal, termed a home signal, is shown in Fig. 5. The permissive

signal known as the distant signal indicates the state of the home signal which follows it. The distant when at danger (see Fig. 6) is a warning to the driver that the home signal ahead is against him, and that he must be prepared to stop at it. It may be "off" (i.e. at "line clear") when he arrives within sight of it, but that does not matter, for he has had the warning. On model railways distant signals are not absolutely necessary, as in the case of an electrically operated railway the signalman is also the driver. They are therefore useful as ornaments only. In a clockwork railway the distant signal can be on the site of the trip gear operating the brake on the engine, or the latter may be used instead of a visual "distant."

Dealing with shunting or subsidiary signals, the ringed semaphore arm shown in Fig. 8 is used for sidings or branch lines. For shunting purposes a small or "calling on" arm is often fitted lower down on the same post as a home signal to call on an engine for a limited distance past the main home signal at danger.

The home signal semaphore is coloured red on the front with a white stripe, and white on the back with a black stripe. The lens are red for danger and green for the lowered "all right" position. In the distant signal



Railway. Fig. 1. Non-continuous lay-out with stations at the adjacent ends. Fig. 2. Two terminals with passing station. Fig. 3. More elaborate plan suited to steam working.

last main line portions should emerge from the straight or slightly curved sections.

Electrically Operated Systems. Electric third-rail systems are often provided with a central conductor rail raised ½ in. or ¾ in. above the level of the running rails. The return for the current is via a running rail. Since at points and crossings the collecting shoe on the engine or car must not touch a running rail at the moment of crossing, the shoe must be suitably adjusted in its range of vertical movement. To prevent such accidental contact a good plan is to solder a piece of 14 S.W.G. copper wire to the shoe so that it extends clear of all wheels and other parts of the engine outside the running rails (Fig. 4, B). At the points the conductor rail is omitted from between the tracks and extended along the outside of the tracks. The shoe is thus always in contact with a conductor rail, either inside or outside, and cannot fall below its proper level. The rails are arranged as shown on the plan (Fig. 4, A).

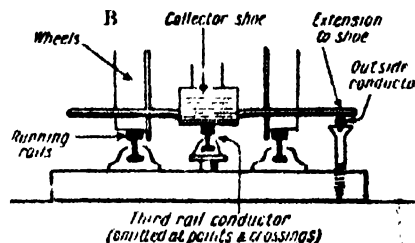
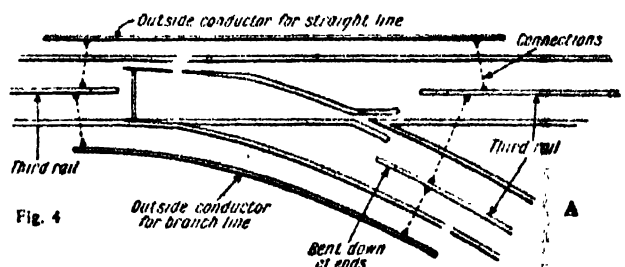
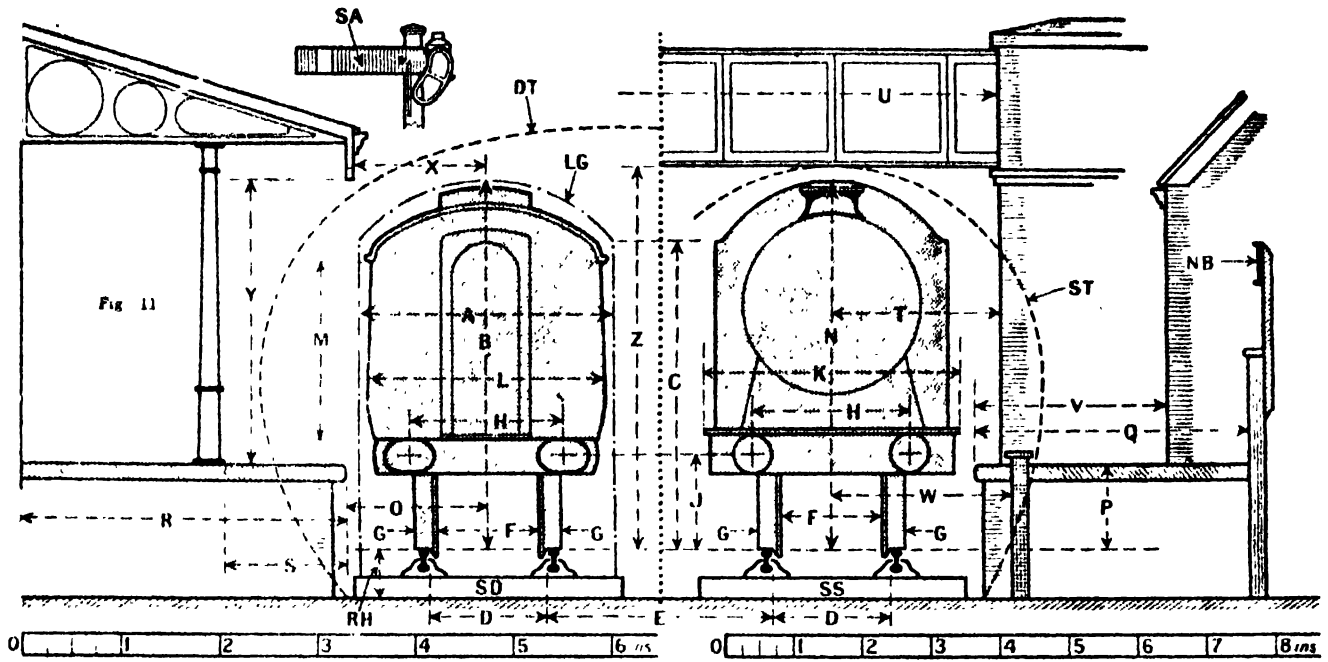


Fig. 4. Electrically operated system. A, arrangement of conductor rail at crossings. B, extension of collector shoe to reach outside conductor.

yellow takes the place of red both on the signal arm and in the "danger" lens. The chevron stripes on the arm are coloured black, back and front, and the end of the semaphore is always "fish" or "swallow" tailed, as shown in Fig. 6.

In many of the latest types of signals the semaphore arm has an upward inclination from the horizontal for the line clear position as shown in Fig. 7. In this kind of signal, therefore, the arm rises into the air instead of falling. The dotted outlines in Figs. 5, 6 and 7 show the line clear position of the arms.



Scale for No. 0 Gauge

Scale for No. 1 Gauge

Railway Fig. 11. Diagram showing the standard dimensions of rolling stock and permanent way for model railways, gauges No. 0 and No. 1. A scale of measurements for each gauge is given at foot. For references see accompanying table.

Colour Light Signals. These are now coming into use especially on urban lines of railway. In such signals a powerful electric lamp is placed in a funnel-shaped recess facing the driver, and this light can be seen quite clearly both day and night. The systems are

numerous, as the final development is not yet complete. Light signals may be very easily modelled by using the small light bulbs now readily obtainable in the lower voltages.

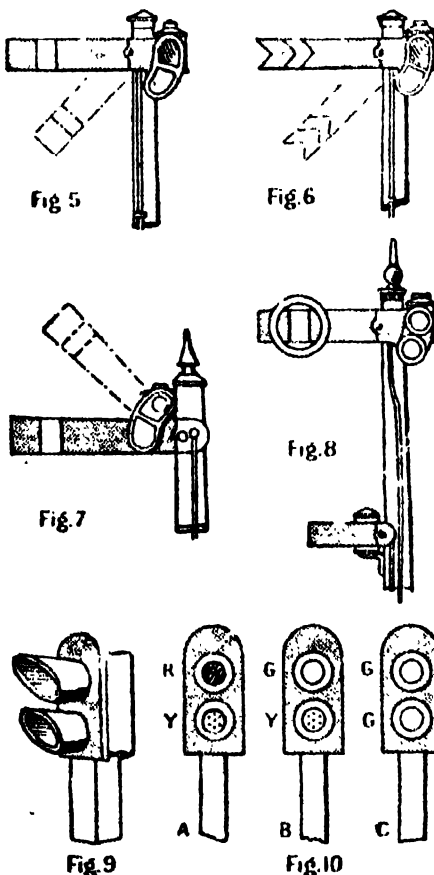
One system in which two lights are employed (Fig. 9) is very suitable for model railway work. The danger position of the pair of signal lights is shown at A in Fig. 10. The combination functions as a home signal, and a distant signal for the next section. One (the stop signal) lamp shows red and the lower one yellow. A train must not pass this signal. The next state (B), the upper light showing green, indicates that a train may pass up to the next signal. The third state (C), in which both lamps show green, means that two sections ahead are quite clear.

Model Buildings. Station buildings, bridges, tunnels, embankments and cuttings are accessories essential to any permanent lay-out. For a railway that must be dismantled after use these units may be made in separate components, laid alongside the line when in operation. For any railway that is permanently installed in a room allotted to it, proper track material obtained in loose parts is recommended. A firm foundation about 2 ft. 10 in. or 3 ft. from the ground level should be built up, and the sleepers nailed to this. Ballasting can be effected by gluing the surface of the base and sprinkling chicken-grit on it while it is tacky. Where the track is purchased in lengths, with the wood sleepers made up on longitudinal battens, the ballast should be laid in loosely, as a considerable depth is necessary to reach to the top surface of the sleepers. Ready-made tinplate track should only be employed when a permanent track is not possible.

Electric Locomotives. It is important, before purchasing an electrically driven model locomotive or the component parts for making one, to know something of the various systems employed.

For use with direct current of any voltage the ordinary electric motor with a series-wound field and armature is the best possible unit for traction purposes, whatever the size of the locomotive may be. The only disadvantage it has is that reversing must be done either by

Ref. Letter	Description	Gauge No. 0	Gauge No. 1
A	Maximum loading	in	in.
B	Gauge width	2 1/2	3 1/2
C	" " Height	3 1/2	5 1/2
D	" " Height at side	3 1/2	4 1/2
E	Gauge between rails	1 1/2	1 1/2
F	Space between tracks ("six-foot way")	2 1/2	3 1/2
G	Between wheel tires	1 1/2-1 3/4	1 1/2
H	Track width	1 1/2	1 1/2
J	Buffer centres width apart	1 1/2	2 1/2
K	" " height from rail	1 1/2	1 1/2
L	Maximum loco width	2 1/2	3 1/2
M	Maximum coach body width	2 1/2	3 1/2
N	Side height coach body	1 1/2	2 1/2
O	Maximum height of loco, chimney from rail	3 1/2	5 1/2
P	Platform edge from track centre	1 1/2	2 1/2
Q	Platform height above rail level	1 1/2	1 1/2
R	Minimum width of platform	2 1/2	4
S	Average width of platform	3 1/2	4 1/2
T	Nearest fixture on platform	1 1/2	1 1/2
U	Nearest bridge pier	1 1/2	2 1/2
V	Minimum width of bridges (double line)	6 1/2	9 1/2
W	Nearest building on platform	1 1/2	2 1/2
X	Nearest underbridge parapet	1 1/2	2 1/2
Y	Nearest platform awning	1 1/2	1 1/2
Z	Minimum height of platform awning	2 1/2	4
ST	Minimum clearance of over line bridge	4	6 1/2
DT	Single line tunnel	Use scale attached to drawing	
NB	Double line tunnel	Use scale attached to drawing	
SA	Station name boards	See A, B, C dimensions	
LG	Signal arms	See A, B, C dimensions	
SO	Outline of loading gauge	See A, B, C dimensions	
SS	Sleeper sizes (ordinary type)	2 1/2 x 1 1/2	3 1/2 x 2 1/2
TN	Sleeper spacing: average centres 1 lb. in the model equals	1 1/2	2
RH	Rail height for scale track	20 scale tons	13 scale tons
	" " for ordinary track	1	1



Railway. Model Signal Systems. Fig. 5. Home signal. Fig. 6. Distant signal. Fig. 7. Upward inclining signal. Fig. 8. Miding or branch line semaphores. Fig. 9 and 10. Colour light signals.



Railway Well arranged gauge No. 0 indoor railway with tracks on two different levels
Courtesy of W. J. Bassett-Lowke

a hand switch, or an automatic polarised relay switch on the engine. It is necessary to reverse the relation between the direction of the currents in the armature and the wound field magnet. Simply reversing the supply of current to the rails will not make any difference to the direction of rotation of the motor.

All the larger and better qualities of model electric locomotives have a wound field, and since reversing from a distance is desirable, a permanent magnet switch or reverser is usually fitted in the locomotive. This switch is sensitive to the direction of the current, and when the operator changes it over from positive to negative, or vice versa, the switch follows this movement and changes over the connexions in the motor, thereby effecting a reversal of the engine. Smaller models, in gauges Nos. 0 and 1 more particularly, are fitted with motors having permanent magnet fields (like a car magnet). The field polarity is therefore constant, and the only path for the track current is through the armature of the motor. Changing this over reverses the motor.

Electric locomotives fitted with permanent magnet fields and also those with series motors and polarised relay switches are usable only on railways operated by direct current. Accumulators are the only really satisfactory source of supply. However, it is possible to break down the house supply (direct) current through a transformer, and this method can be used on model railways where one or two engines only are used.

The voltages used vary from 4 to 25, the higher voltage, of course, decreasing the amperage consumed, and getting over some other difficulties. For a 4 volt loco a 6 volt accumulator should be installed to allow for drop in voltage and speed regulation. For a 25 volt installation the source of supply should be about 30 volts maximum.

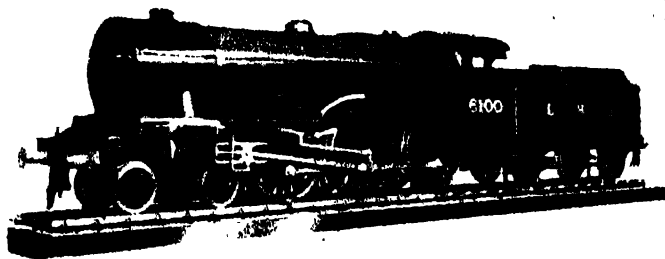
In every section of the line governed by a separate operator a resistance switch to regulate speed and a commutator switch to change over the current direction and effect reversal are necessary. These may be combined and worked by one handle. The line may

be sectionalised by tumbler or other plain switches between this main controller and the various parts of the railway.

A type of locomotive with a series motor having a wire-wound laminated field and armature has been placed on the market for use with alternating current. The house supply can be utilized, a static transformer cutting down the house voltage to a low one that is safe and suitable for a model railway. These locomotives require a hand switch on the engine to effect reversal, a polarised (permanent magnet) relay switch not being possible. A magnetic device is fitted to some makes of engines whereby the act of switching on the current turns through a mechanical ratchet motion a barrel reversing switch. The apparatus employed works in a sequence of operations, first forward and then backward. The switch can be also operated by hand. A disadvantage of the scheme is that any accidental breaking of the current supply operates the reversing switch, and the next time the current is switched on the locomotive travels in the opposite direction.

Clockwork Model Locomotives Clockwork is to be preferred as a mechanism for driving model locomotives where juveniles have to be catered for. The youngster can do no harm to himself or his surroundings in its use. At the same time this form of motive power is often employed by the more advanced model railwayman. Where the latter's concern is chiefly railway operation, and he desires accuracy of visible detail both in the track and rolling stock, then the spring motor has many advantages. The railway should be designed to suit the length of run at one winding.

The modern mechanism can be supplied with reversing gear, brakes and speed changes. Within recent years a variable speed governor on the lines of the gramophone governor has been applied to the better quality motors. A means of reversing from the track is usually fitted, but it is rather a clumsy device not recommended except for the small four-wheeled shunting engine, a type of model for which the arrangement was first introduced. However, although the trip-gear is provided on the locomotive, the reverser need not be used, as special trigger rails are required to operate the mechanism. Clockwork locomotives should not be run with the wheels spinning in the air, nor should the engine be



Model London, Midland and Scottish express locomotive, Royal Scot
Courtesy of Messrs. Bassett-Lowke, Ltd.

left wound up for indefinite periods after use. The gears should be kept quite clean, washed occasionally with paraffin, and lubricated frequently though not copiously with a light sewing machine or cycle oil.

Spring motors were at one time fitted to model engines as large as 2½ in. gauge, but the tendency now is to limit the use of this motive power to gauge No. 0 (1½ in.) and gauge No. 00 (½ in.) locomotives.

Steam Models. The steam loco as a working model depends for its success on the provision of a satisfactory fire to turn the water in the boiler into steam at sufficient pressure. There are practical reasons against making scale models of any type of locomotive above gauge No. 0 size to work by steam power. The larger engines, those of American proportions more particularly, are quite easily modelled, and if the boilers are raised up, without regard to scale, to give more room for the flame of the lamp, it is possible to make a small type of locomotive steam well. Of course, a small boiler means a short length of run.

All successful No. 0 gauge model steam locomotives are fired with methylated spirit burned in a special form of vaporising lamp. The pilot wick vaporises the fuel and keeps the lamp alight. As a rule plain cylindrical boilers with the flame underneath are employed in conjunction with these vaporising lamps. The same system is also used for No. 1 gauge models, and as the boilers of these locomotives have a more generous capacity, the length of run can be increased from 90 minutes in a gauge No. 0 scale model to 160 minutes in a similar gauge No. 1 engine.

The steam pressures used are somewhat low, varying from 15 to 25 lb. per sq. inch. This allows thin plates to be safely used in the construction of the boilers, increasing

MODEL RAILWAY SYSTEMS IN GENERAL USE

Gauge No. 00 (½ in.)

Scale 1 mm. to 1 foot, 1/16th full size

Rather small for average model maker, allows for a complete railway system in small room. Rolling stock and track parts obtainable in various styles. Locomotives except for two or three designs of a very cheap kind, rather more expensive than No. 0 gauge models.

Gauge No. 0 (1½ in.)

Scale 7 mm. to 1 foot, 1/16th full size

Most popular gauge. Steam, electric and clockwork locomotives of all kinds and values readily obtainable. Almost every accessory necessary to a complete railway available. Recommended for electric and clockwork operation.

Gauge No. 1 (2 in.)

Scale 10 mm. to 1 foot, 1/16th full size

Some what larger than No. 0 gauge but quite as satisfactory. This gauge is recommended for steam models.

Gauge 2½ in. ("Half inch" scale).

Actual scale 17.32 in. to 1 foot, approx. 1/32nd full size

Smallest outdoor gauge that can be recommended. Suited to locomotives of the "engine-made" type. Smallest practical size for coal and charcoal fired boilers.

Gauges 3½ in., 4½ in., and 5 in.

1 in. scale and 1 in. scale.

Standard gauges used in making locomotives of an engineering character, without regard to the tracks on which they may run. Used for passenger hauling at Model Railway Club exhibitions.

Gauges 6 in., 7½ in., 9 in., and 15 in.

Scales 1½ in., 1½ in., 2 in., and 3½ in. to the foot.

Gauges suitable for garden, estate and pleasure ground railways. Operated with locos, working by steam or internal combustion engines.

incidentally the value of the surfaces heated by the lamp. The cylinders are usually of the piston valve type, and work with very little frictional loss. There is no packing of any kind, and therefore pressures used must be comparatively low. Care is required in lubricating the cylinders and valves, and the oil should be of the proper type and grade recommended by the makers, quite free from dirt and grit. Friction must be kept at the minimum, so that the low boiler pressure can be used with effect.

Spirit reservoirs are usually proportioned so that the fuel is exhausted before the water in the boiler reaches a dangerously low limit. The safety valve should be examined each time the engine is used to see that it has not stuck up during the period of disuse. Reversing is usually arranged by a change over valve, worked from the cab, which commutates the directions of the "live" and "exhaust" streams.

RAINPROOF CLOTH. Oilskin or mackintosh cloth is needed to resist really heavy wettings, but the treatment which makes it waterproof closes up the pores of the fabric. Rainproof cloth, while fairly resistant to ordinary showers, is just as well ventilated as unwaterproofed fabrics. Cottons, woollens, and silks can all be rainproofed, and, although principally employed to make raincoats, they can be used for ordinary suits and dresses.

The processes used affect only in an imperceptible degree the appearance, touch, and colour of the article. These processes cannot, however, be attempted at home without inviting disappointment and courting risks. The goods need first to be prepared and to have all grease removed, and the most efficacious results are obtained from a combination of chemical and mechanical methods. The cloth is best impregnated with a chemical (acetate of alumina), and this, unless properly done, may spoil the colour.

The goods are then dried and given an impenetrably fine film of wax, and it is important to have the right mixture of waxes. The wax may be rubbed on dry, when it is almost impossible to avoid the production of shiny streaks, or be applied in a melted state, for which purpose a trace of wax is laid on by means of a metal roller; or the wax may be dissolved, e.g. in petrol, into which the cloth is dipped.

A rainproof coat when wet is best dried near a fire. Mackintoshes are spoiled by heat; rainproofs are benefited, if not placed too close.

RAINWATER: Domestic Uses. The collection and storage of rainwater is important, especially in the case of any country house that depends upon a well for its water supply. Care has often to be exercised in the consumption of the drinking supply, owing to the well or other source of supply being low during prolonged dry weather. In this case it is a great boon to have a good supply of fairly clean rainwater. Rainwater has the advantage of being soft, and is therefore very effective for washing purposes.

The uses to which the rainwater can be put depend upon the condition of the water itself. If it is stored in a clean tank or cistern, and properly filtered, it can be used for almost any purpose in emergency, even for drinking, if first boiled. As so much depends upon the state of the water, it is worth while to see that it is caught and stored in clean tanks where it will not be greatly affected by the surroundings. The rain will wash dirt off the roof, making the water in the collection tank dirty. To overcome this trouble, an apparatus known as a "rainwater separator" may be used. The action is for the first foul washings of the roof to be turned away to waste, only allowing the cleaner portion of the rainfall to be stored. The apparatus is automatic in

action, and the area of the roof governs the size of the separator.

In many cases it is almost essential to filter the water before it is used for any domestic purposes, this being done by connecting the collection tank by means of a pipe to a modern filter. If the collection tank is in an exposed position the top should be covered by a wire gauze, of as fine a mesh as possible; this prevents small sticks and the like from finding their way into the tank. If the tank is placed near the roof an overflow should be made, flowing to another tank or water butt, on the ground level or other convenient position. If this is not done, and the roof tank should overflow after a heavy rain, the interior of the house would probably suffer.

It is sometimes difficult to place a single tank so that it collects the whole of the rainwater, as the gutters cannot all slope in the same direction. For this reason water butts or tanks should be placed at the various down pipes, while it is sometimes possible to lead some of the water to an underground tank and then pump it out by means of an ordinary hand pump, as required. The diagram shows how a large underground tank can be built of brick and rendered in cement. The rainwater passes first through a filter bed containing clean washed gravel and coke.

RAISIN: In Cookery. The dried fruit of the grape vine known as the raisin is extensively used in cookery. Muscatel raisins, which are dried on the vines, are considered to be the best, and, together with almonds, are often used as a dessert fruit. Sultana raisins are prepared from a special sweet grape.

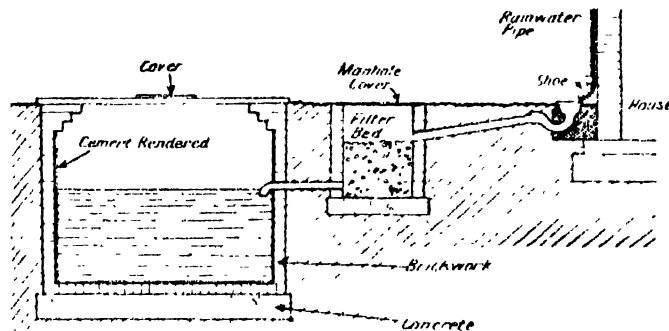
Raisins should always be cleaned before use. The simplest way of doing this is to rub them on top of a sieve with a tablespoonful of flour; but if they are very dirty they may be washed in the same way as currants.

Before raisins are mixed with other ingredients, the stalks should be carefully removed, and the stones taken out with a fruit-stoning machine, if available. Raisins are usually cut into small pieces. A little butter rubbed on both sides of a knife will prevent the fruit from sticking to it; if a food chopper is used, a few drops of lemon juice should be added instead. Raisins can be bought ready stoned.

Raisin and Apple Pie. Raisins and apples together make the following excellent pie. Wash and stone $\frac{1}{2}$ lb. raisins, leave them to soak in a basin of cold water for a few hours, and then peel 1 lb. apples, cut them into thick

slices, and remove the cores. Strain off the water from the raisins, reserving it; stand a funnel in the centre of a pie-dish, and fill the latter with the raisins and apple mixed together, a few slices of thinly pared lemon rind, and 3 oz. Demerara sugar.

Add about a gill of the water in which the raisins were soaked. Make 6 oz. flaky pastry, roll it out to a thickness of $\frac{1}{4}$ in., and cut from it a piece large enough to cover the top of the pie and some narrow strips for the edges. Damp the edges of the dish, put on the strips, damp these also, and then lay on the top



Rainwater. Sectional view of underground tank and filter bed, showing how the water is purified in clean washed gravel and coke, before being delivered into the cement lined storage tank.

covering. Trim the edges, brush over the top with milk, and bake the pie in a hot oven for about $\frac{1}{2}$ hour, or until the pastry is lightly browned and the fruit cooked. Serve it dusted with castor sugar.

Raisin Batter. To make this steamed pudding, add 4 oz. prepared raisins to an ordinary batter pudding mixture (see page 70). Decorate a greased mould with a few raisins, and pour in the mixture. Cover with greased paper and a floured pudding cloth, and steam it for about 2 hours.

Raisin Chutney. Chutney made from equal quantities of apple and raisins can be prepared thus. Peel and cut 1 lb. apples, and half that quantity of shallots into dice, mix them with 1 lb. stoned raisins, $\frac{1}{2}$ lb. brown sugar, 2 oz. salt, $\frac{1}{2}$ oz. mustard seed, $\frac{1}{2}$ pint vinegar, and cayenne to taste. Simmer them gently in a pan for about 1½ hours, then put the mixture into a clean and dry jar or bottle, and tie it down when the contents are cold.

Raisin Dumpling. Add 6 oz. prepared raisins to ordinary suet dumpling mixture, divide it into small even-sized portions, and roll these into balls on a floured pastry-board. Cook them rapidly in a saucepan of boiling water for about $\frac{1}{2}$ hour, or until they rise to the surface of the water, then take them out and serve them with sugar, and, if liked, some custard sauce.

Raisin Wine. Boil together 6 lb. raisins and 6 gallons water, and when the fruit is soft rub it through a sieve so as to remove the stones. Then put the pulp back into the pan, pour it, with the water, over the sugar, and add $\frac{1}{2}$ pint dried yeast spread on toast. Leave the mixture to ferment, and when fermentation has almost ceased, put in 2 quarts of elder flowers tied in a muslin bag, taking them out again when the wine is sufficiently flavoured. Bottling may be done as soon as the wine is clear. See Batter, Dumpling, Pastry, Sultana.

RAISING PLATE. The name is given to a small beam which rests upon the tie beams in a roof for the purpose of supporting the lower ends of the common rafters. The expression is also applied in some districts to the pole plate, or wall plate.

The general purpose of this timber is to raise the rafters above the level of the brickwork composing the wall so that air can circulate



Raisin Batter. A wholesome, steamed pudding appreciated in the nursery.

around it. Another function is to tie the ends of the rafters together, and also to distribute the load by spreading it over a large area. See Rafter; Roof.

RAKE. This garden tool, with either wooden or metal teeth, is used for removing stones from a dug surface; for levelling a surface after digging; for getting a fine tilth (powder) on a surface for seed-sowing; and similar operations. There is a special form of rake for removing moss from a lawn. The handle of any kind of rake will raise blisters unless it is kept clean with scrubbing brush and water. A rake should be hung up when it is not being used.

RAM: For Raising Water. The hydraulic ram utilizes the momentum of a volume of moving water to force a portion of the water to a higher level than that of the original head. The principle is illustrated in Fig. 1. Water falls from the reservoir through pipe A to a ram chamber having a valve V_1 . The delivery valve V_2 is kept closed while V_1 is open, owing to the greater pressure of water in the delivery pipe. When the velocity of the water escaping past V_1 through the holes O O reaches a certain figure this valve is suddenly forced up against its seating, and the trapped water opens V_2 and enters the delivery pipe until its momentum is expended. Then V_2 closes, and V_1 opens again, the cycle of operations continuing as long as water is supplied with sufficient head to pipe A. The greater the lift, the smaller is the proportion of the water forced into the delivery pipe.

As a guide, it may be taken that the quantity, D, delivered will be equal to half the quantity (F) that enters the ram chamber multiplied by $\frac{W}{Y}$ in feet, where W = the working fall and Y = the total lift from the ram. Thus if the working fall be 10 ft. and the delivery head 100 ft., and F = 200 gal. per minute, then $D = \frac{1}{2} \times \frac{200}{10} = 10$ gal. per minute.

The ram illustrated in Fig. 2 is suitable for working falls from 3 ft. to 10 ft., with delivery up to a height of 100 ft. This latter figure does not take into account losses due to friction, which virtually increase the delivery head and diminish the practicable height to which water can be raised. See Pump; Water Supply.

RAMBLER: The Rose. This term is applied to vigorous climbing roses chiefly of two types, those raised from *Rosa multiflora* and others raised from *Rosa wichuraiana*. The multiflora ramblers are rather less rampant than those of the wichuraiana type, favourite varieties are Blush Rambler, Goldhueb, Pemberton's White Rambler, Tausendschon, Tea Rambler, and Violotta and Veilchenblau (the so-called blue roses). All these are suitable for covering poles, pillars and arches. Some of the best ramblers of the wichuraiana type are Alberic Barlaer, American Pillar, Asotaur, Blériot, Chatillon Rambler, Pink Chabot, Dorothy Perkins, Dr. Van Fleet, Emily Gray, Fraicheur, Huawatha, Sander's White, Scarlet Climber and Thelma. These are suitable for covering arches, arbours and trellis. See Rose.

RAMMER. An earth rammer is used to consolidate the surface of the ground when making a path, or after erecting a post. A heavy wooden rammer is employed when setting paving stones or cobbles. It measures about 3 ft. in height and 8 or 9 in. in diameter, tapering towards the top, where it is furnished with a single hand grip. A

second grip is fitted at right angles about half way down, and the lower end, or head, is shod with hoops to prevent it splitting.

A rammer with an iron head is handy in



Fig. 1

Ram. Fig. 1. Diagram illustrating principle of hydraulic ram. Fig. 2. Small hydraulic ram suitable for working falls from 3-10 ft.

and the ramming is effected rather more by pressing or pushing the earth downwards.

RAMONDIA. This is a charming rock garden plant with a rosette of large leaves. It bears pretty purplish flowers in early summer. The best are Heldreichii, lavender blue; pyrenaea, violet purple; and Nathaliae, purple. Ramonda must be planted flat against a shady rock with its roots in a crevice filled with a compost of loam, peat (or leaf-mould) and sand. Propagation is by sowing seeds or by division in late summer.

RANGES FOR LARGE AND SMALL HOUSES

Advice on Choosing and Fixing this Adjunct to the Kitchen

Articles related to the one below include those on Anthracite Stove; Coal; Fuel. See also Boiler; Central Heating; Kitchen; Oven; Etc.

The older type of kitchen range earned for itself an unenviable reputation, concerning as it did large quantities of fuel; often with poor and variable results. The cause was generally to be found in badly designed or inefficiently built flues; open fires and badly constructed fire grates; the absence of proper

means of draught regulation; the absence of insulation from the front and sides; the lack of a highly polished top, and in the design and placing of the hot water boiler. These defects are overcome in modern types of kitchen range, which are scientifically designed and provided with various fuel and labour-saving devices.

Instead of supplying merely the working portion of the range and leaving the flue to be built up in brickwork by the builder, the stove manufacturers provide iron flues, which can

RAMPION. This is the common name of phyteuma, a genus of hardy plants belonging to the bellflower family. They thrive in well drained gritty soil in the rock garden. Some of the best are canescens, lavender blue; comosa, blue and white; and orbiculare, purplish; they are increased by division in spring. The dense clusters of bloom on rather short stalks give these plants a bizarre appearance.

RANCIDITY. A chemical change which is termed rancidity takes place in fats or oils when exposed to unfavourable conditions of the atmosphere, or kept too long without proper preservation. This change produces a most disagreeable taste and smell, and renders them unfit for food.

Butter particularly has a tendency to become rancid, and this tendency is increased if it is made up without the addition, or the very scanty addition, of salt. But once butter has acquired a rancid taste it is not possible to restore it completely, though it can be much improved. Wash it well and melt it slowly over the fire, skimming it from time to time, then strain it and let it cool. Sometimes butter which is actually fresh possesses a rancid flavour; this is due often to uneven churning or neglect to extract all the buttermilk.

Both olive and almond oil have a tendency to become rancid. Neither of these should be kept too long, and never in a very warm place; the bottles must be well corked. Fish oil quickly acquires a rank, unpleasant taste. See Butter; Fat; Food; Oil; Suet, etc.

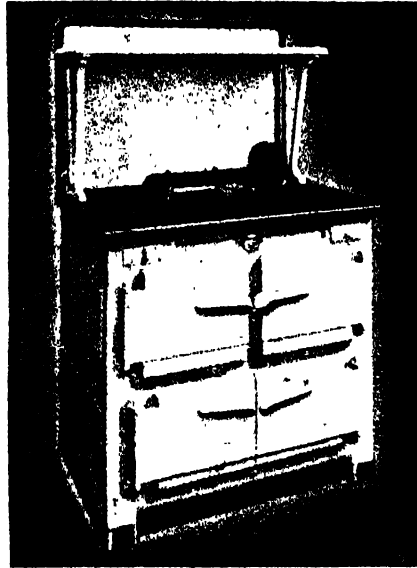
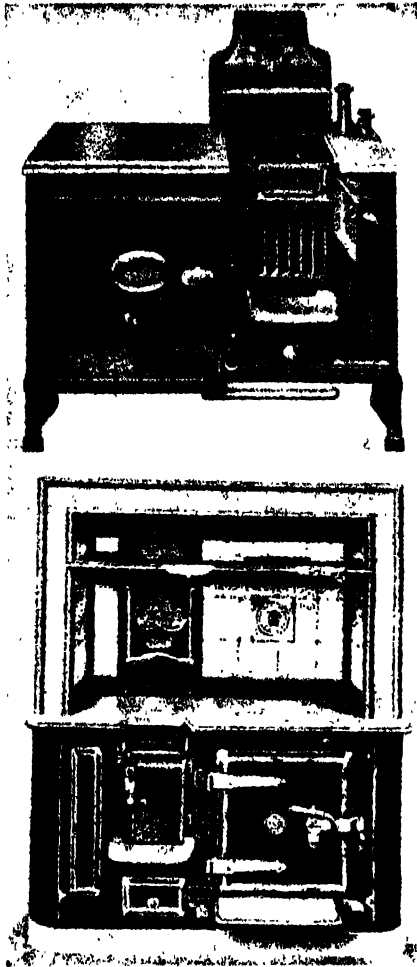
RANDIA. This is the name of the plant from which Indian ink is made. It is a hot-house, evergreen flowering shrub with white or yellow fragrant blossoms, borne in spring. The soil required is a mixture of loam, peat and charcoal, and the temperature should average not less than 60°. Propagation is by cuttings taken in the spring.

be filled round with brickwork when the range is being fitted into the house. The design of a flue is the work of a specialist just as much as the design of the regulation of the air supply to the fire. Too small a flue will give an ineffective draught, as will unnecessary projections, sharp angles or cracks in the flue itself. Too large a flue will cause much of the heat given out by the fire to pass up the chimney. A badly constructed flue may give rise to back draughts, causing the smoke to be blown out into the kitchen.

Well designed ranges are by no means expensive, and the purchaser should not be satisfied with just what the builder cares to supply, but should take the trouble to enquire of one or two manufacturers, stating the duty required of the range and the approximate amount he wishes to spend on it. If there is enough cooking to



Range. Fig. 1. Small portable range, very easy to work. Smith & Wellsted, Ltd.



Ranges. Fig. 2. Larger type, with high-pressure boiler and hot closet. Fig. 3. Single-oven range of conventional pattern, having enamelled base and tiled upper part. Fig. 4. Cooking stove which stands out and permits of side lighting. Fig. 5. Heat storage cooker which can be fitted with a boiler unit.

Photos. Smith & Wellstood, Ltd.

keep the range going during the cold weather, some stoves can be made to give a plentiful supply of hot water for baths and other domestic uses, but it must not be supposed that this will be obtained without an extra consumption of fuel, over and above that normally entailed in cooking.

In the warmer months, when the range is required only at intervals for heavy duty, recourse can be had to the gas cooker which is generally installed in most houses as a matter of course. The problem of hot water supplies can be overcome by the use of a gas or electric circulator, thus being brought into operation during the time that the range is out of use.

When a boiler and a gas cooker are fitted in the kitchen it is often a convenience to install a small portable range in the scullery. Fig. 1 shows an efficient and inexpensive range obtainable in quite small sizes, varying from 24 in. wide to 42 in. wide to suit different kitchens. This range can be obtained with enamel finish at an extra charge.

Fig. 2 illustrates a larger range of the same type, with a plate rack above, and fitted with a high pressure hot-water boiler. A useful hot closet can be provided in the skirting underneath. When the cooking requirements are greater there are two types of range which can be considered, the one (Fig. 3) following conventional lines and the other, (with glass and steel canopy), an approach to a pattern favoured on the Continent, where the stove stands out in the kitchen, thus getting sidelight and permitting access to the side of the range. In the latter an L-shaped boiler is fitted

enclosing three sides of the fire-box and thus having a high degree of efficiency.

The single oven range shown in Fig. 3 is made in sizes to suit a recess from 36 in. to 54 in. wide. The back and sides are tiled, and the base is enamelled. The type of boiler fitted depends on the quantity of water required to be heated, and the least powerful will deal with a 20 gal. cylinder. The bigger boilers are somewhat expensive, and run into as much as a small independent boiler. It is generally better, when the hot water requirements are large, to install a separate coke-fired boiler for the purpose.

An Oil-Fired Range. A larger range is the kind which includes two ovens and also a glass and steel canopy. These may be conveniently arranged for oil firing, a method quite practicable with stoves of this magnitude, though it involves some considerable outlay on the oil burner plant, storage tank, etc. Such a system generally makes use of a trough shaped horizontal burner. The oil is fed by gravity at the bottom of the trough, and the air necessary for combustion is supplied at low pressure from a blower. The same pattern of range is available for coal firing.

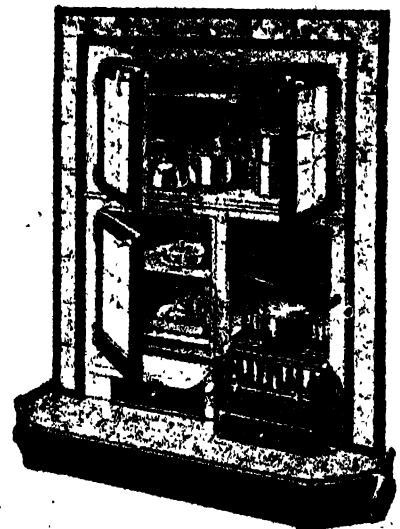
Heat Storage Cookers. These are quite a recent introduction and are becoming very popular owing to the economy, cleanliness and ease of working. The construction is on the lines of the old hay box principle, the cooker itself being embedded in thick insulating material within an enamelled outer casing, and in consequence (unlike the ordinary range) practically none of the heat is wasted. The heat is conducted from the

fire-box to the various parts of the cooker by means of heavy castings and the ovens are of different temperatures for the various classes of food to be cooked. Boiling operations are carried out on the boiling hotplate which when not in use is insulated by the asbestos bolster. The consumption is exceedingly low, from 1 cwt. anthracite per week, according to the size, and the cookers can be supplied to suit from the smallest household to any large establishment. Fires are alight continuously and the flue and chimney cleaning is reduced to the minimum because anthracite is smokeless. Some models can be fitted with a boiler unit to give necessary hot water for domestic purposes. Under the heading Range can also be included the "Aga" cooker, for details of which see Cooker, page 293.

Combination Ranges. It is sometimes a convenience to be able to combine in one stove the means of warming a room, heating water for the bath, etc., and cooking. The range shown in Fig. 6 is typical of a kind which allows a fair amount of cooking to be done at need, while preserving the comfort and cheery appearance of the open fire. Beneath the oven is a grill, and above is a hotplate on which a saucepan, etc., can be kept warm after heating on the fire below. A hot-water boiler is located at the back of the fire. This kind of stove can be fitted into a recess in the kitchen in place of the ordinary range.

The Fuel to Use. Some of the combination appliances are specially designed for burning anthracite and coke, with which they give very good results, but in most ranges a good long flame coal is the best fuel, as the flames are extremely useful in heating the oven. The advice of the maker should be taken as to the most suitable fuel. Where kitchen coal, nuts or cobbles is recommended, the ideal to aim at is a hot, free-burning, clean coal, well sized and without slate.

When lighting the fire, wood or paper or a firelighter should be employed in the ordinary way, care being taken to allow air to pass through freely from below. Coal and cinders from the previous day's fire should be built up lightly above the wood, and when combustion is well established further coal may be added. The dampers should be adjusted according to whether heat is required first for hot water or cooking purposes. Much time will be saved if care is taken to use only paper and wood which are thoroughly dry, and it will assist matters greatly if the coal has been kept in a dry place. Trouble is sometimes experienced in lighting a



Range. Fig. 6. Combination stove which cooks, heats bath water, and warms the room.

Smith & Wellstood, Ltd.

fire, owing to the flues being cold, in which case wood should be burned freely for a short time in order to warm up the range.

It is not advisable to allow a fire to become too low; but if this has been done, only a very small quantity of fuel should be added to the dull fire. The fire should then be raked, the draught opened, and when the fire is burning more briskly fresh fuel added, due care being taken not to put on too much at a time.

In those ranges which depend to a great extent upon flame for heating the oven and boiler the fire should be stoked at the time when oven or boiler heating is required so that full advantage may be taken of the flame produced in the early stages of combustion.

RANUNCULUS. Some of the worst garden weeds as well as many beautiful hardy flowering plants are contained in this genus. The weeds are the various wild buttercups of which the most troublesome is the common buttercup (*Ranunculus acris*). Fair Maids of France (*Aconitifolius flore pleno*), which bears small double white flowers on stems 20 in.



Ranunculus. Bright gold flowers of an attractive little plant for a shrubbery or rock garden

high in May is a charming plant for moist soil. It is happy by the waterside or in the bog garden. *Amplexicaulis*, 10 in., with grey leaves and white flowers, and *lingua*, 2 ft., yellow flowers in summer, are also good plants for moist soil.

Several alpine buttercups are delightful flowering plants for the rock garden, the best of them are *montanus* yellow, *alpestris*, *glacialis* and *parnassifolius*, with white flowers in early summer they need well drained gritty, loamy soil and slight shade.

There are some brilliantly coloured flowers among the florists' varieties of tuberous rooted ranunculus of which there are various types - French, Turban and Persian. The double Turban varieties are very handsome. The tubers should be planted, claws down wards, in early autumn or in February-March in well-drained soil with which sand has been mixed freely, if necessary they should be set about 2 in. deep. It is wise to protect the bed with bracken or evergreen branches in severe weather and to lift and store the roots after the leaves have died down. See Bachelor's Button.

RAPE. Rape is the popular name of a salad vegetable, *Brassica napus* which is usually grown and sold as mustard in the mixture of mustard and cress. Cultivation is the same as for mustard. When used as mustard in mustard and cress the proportions of seed to be used should be as two of rape to one of cress in bulk. If sown thickly on

vacant ground and dug in when a few inches high rape makes an excellent green manure. See Cress; Mustard.

RASH. An eruption on the skin or the mucous membranes is popularly called a rash. It may consist of redness, pimples, blisters, pustules, or mixtures of these. Most of the infectious diseases have characteristic rashes, which observe a fairly constant rule with regard to the time of their appearance in the course of a particular disease. They may be summarised thus: The usual day of appearance: First day: erysipelas, chicken-pox, rubella or German measles (may be on second or third day). Second day: scarlet fever. Third or fourth day: small-pox, the fourth, measles. Fifth day: typhus. Eighth or ninth day: typhoid fever.

The distribution of the rash. Erysipelas unless there is a wound, on the bridge of the nose and the cheeks usually. Chicken-pox over the body and in the mouth. German measles, the face and neck, then over the trunk and limbs. Scarlet fever, the neck and

chest, then over the body. Small-pox, the forehead and wrists, then over the body. Measles, the forehead, face, neck, fauces, and over the body. Typhus, the abdomen, then over the body. Typhoid, the abdomen, back, chest and elsewhere.

A rash may also be due to poisons, either those formed within the body in digestive and other disorders, or those which are introduced into the body, and a rash often follows the use of antitoxic sera.

RASP: Its Uses. A rasp is a kind of rough file used for shaping wood and other comparatively soft material. Amongst many varieties the ordinary pattern is that known as the half-round, one side being flat and the other semicircular in cross section. Rasps are also obtainable flat, circular and square in cross section.

A cabinet rasp is a half-round rasp with rather finer teeth than the ordinary kind. The rougher types are employed for primary shaping and the cabinet rasps for further finishing the wood.

RASPBERRY AND RASPBERRY DISHES

Success in Growing the Fruit and its Table Uses

The following article follows our usual plan. The growing of the bush is first described and information given about diseases and pests that attack it. Then come details about preparing raspberries in various ways for the table.

Rich soil is essential to the successful cultivation of the raspberry, an invaluable hardy bush fruit. Before the canes are put in, the ground ought to be dug deeply and manured. A mulch or top dressing of manure in spring is also advised. Every 3 years basic slag, 4 oz. to the square yard of ground, should be applied in autumn. The plants ought to be 2 ft. apart in rows 5 ft. from each other.

In spring the canes of newly planted raspberries should be cut down to within about 6 in. of the ground to force the development of fresh strong shoots which will bear fruits the following year. No further pruning is needed until after the fruits are gathered. The old canes ought then to be cut right out and a limited number of new ones, five or six on each plant, ought to be tied to the support. Similar pruning should be done every year when the fruits are over. Early in the summer numerous fresh shoots or suckers will develop, but those in excess of the number required should be pulled up. They may if necessary be transplanted to form a fresh plantation.

Some of the best red varieties of summer fruiting raspberries are undoubtedly Norfolk Giant, Pyne's Royal and Red Cross. Lloyd George is called a perpetual fruiting variety because it bears fruit in autumn as well as in summer. It is pruned in the way described above. Yellow Antwerp is one of the best yellow raspberries.

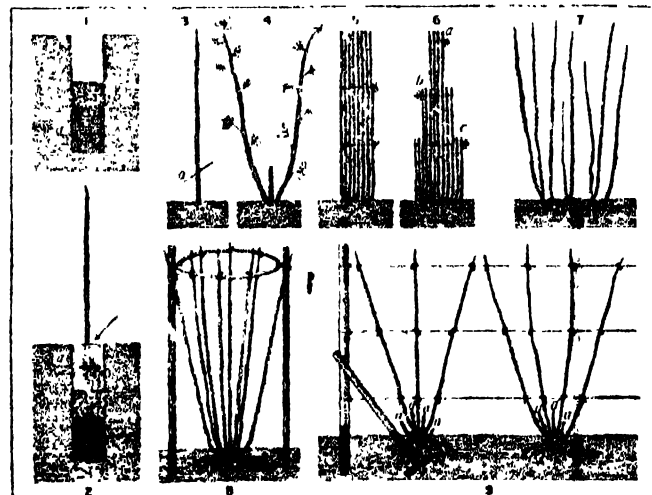
Autumn fruiting raspberries, which bear crops in September and October, need quite different pruning from the summer fruiting raspberries. All the canes must be cut almost to the ground in spring, for the fruits will be produced by the fresh shoots. Good varieties are Hailsham,

October Red and November Abundance. If required for jam or for cooking purposes, raspberries should be gathered as soon as they come readily off the cane, just in advance of perfect ripeness. Choice raspberries intended for dessert should be picked with the stalks just before they are ripe enough to drop off.

Raspberry Pests. The chief pests which damage this fruit are the raspberry beetle, raspberry weevil and the caterpillars of the raspberry moth.

The raspberry beetle makes its appearance during early summer and begins to attack flowers and flower buds, any blossoms left to mature as fruit being devoured in due course by its hungry, voracious larva. The latter result occurs because during flowering time the female deposits eggs near blossoms, out of which the young grubs hatch and feed upon the raspberries. When fruiting ends the full-fed maggots pupate in some crack of stem or bark, remaining in the pupal state until they again emerge as beetles.

One remedy is dusting with derris powder before the flower buds open. Another is shaking of canes over paper smeared with a



Raspberry Cultivation. 1. Soil preparation: a, well-dug bottom soil; b, manure. 2. Planting up to old soil mark: a, firm soil. 3. Maiden cut down (a) after planting. 4. The result. 5 and 6. Theory of pruning: a, removal of tips encourages tip fruit only; a, b, and c graded pruning, the best method. 7. Planting too close. 8. How to train a clump. 9. Training on wires: a, old canes cut out.



Raspberry. Left. Large and luscious berries of the Perfection variety, a favourite kind with fruit growers. Right. Perpetual fruiting variety known as Lloyd George



sticky substance, the whole then being burnt. In addition an autumn soil fumigant of 1 part naphthaline to 10 parts fine coal ash should be forked in.

The raspberry weevil is difficult to deal with, because of its nocturnal habits. It must be sought at night-time while engaged in feeding, when all affected shoots must be well shaken over a board smeared with tar or with some similarly sticky substance.

Activity of the raspberry weevil is generally evident by badly eaten foliage, appearing without the presence of insects during daytime. Soil fumigation with a recognized preparation during late autumn is a good remedy, also spraying with lead arsenate before any of the canes fruit. A more homely remedy consists of ashes soaked in paraffin and sprinkled round the plants. The weevil hides in the soil during the day.

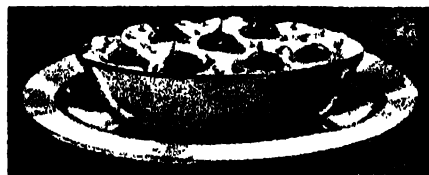
Raspberry Moth. The raspberry moth is sometimes a serious pest. If an infected plantation be examined early in May it will be seen that many young shoots have withered owing to the attacks of the small red caterpillars of this moth, which bore their way into the shoots. The remedies are to keep the ground clean, free from rubbish, weeds, old sticks, etc., and to spray the raspberry canes in winter with paraffin emulsion. A further remedy that will be found effective in destroying the raspberry moth is to spray late in March with lime wash made by using 12 lb of quicklime in 10 gallons of water.

Raspberry Sawfly. The larvae of the pest called the raspberry sawfly feed upon the pith and cause the canes to shrivel. Caterpillars are about $\frac{1}{2}$ in. long and may be identified by their colouring of insipid green. The only remedies are burning of canes containing grubs and spraying with lead arsenate paste during the late autumn. The paste should be purchased ready mixed, and used in the proportion of 4 oz. to 5 gallons of water. The mixture is very poisonous.

How to Cook. If required for jam or for cooking purposes, raspberries should be gathered as soon as they come readily off the cane, just in advance of perfect ripeness. Choice raspberries intended for dessert should be picked with the stalks just before they are ripe enough to drop off. Discard any damaged berries and place the others in a glass or china fruit dish. Castor sugar may be sprinkled over them a little while before they are to be served, or it may be handed round at

the table. Like strawberries, raspberries may also be served with castor sugar and cream. Raspberries are mixed with red currants for stewing or for making into pies and tarts or for jam. With bananas, raspberries can be made into a good fruit puree.

Raspberry Jam. To every lb of fruit used in making raspberry jam, 1 lb sugar should be allowed. Pick over the raspberries, and put them into a preserving pan with the sugar; cook them very slowly, and keep them well stirred until the sugar has dissolved.



Raspberry Trifle. A very delicious fruit trifle made with fresh fruit

Then bring the whole to the boil, and continue boiling for about one hour or until the jam sets when tested on a cold plate.

Raspberry Jelly. A very good raspberry and claret jelly can be made as follows: Boil up $\frac{1}{2}$ pint raspberries, $\frac{1}{2}$ pint claret, $\frac{1}{2}$ pint lemon juice, 4 oz. sugar, the rind of a lemon, two cloves, and 2 $\frac{1}{2}$ oz. melted leaf gelatine. Strain the whole through muslin, and then pour a little of it into a wet mould.

When it sets, decorate it with some chopped pistachio nuts, cover these with a little more jelly, and let this set also. Then pour in what remains and put the mould in a cool place. When its contents are set, turn them into a glass dish and it will be ready to serve.

Raspberry Pudding. A raspberry pudding, in which red currants also are used, is made thus: Line the edges of a deep dish with a strip of short crust pastry, and into the dish put 1 pint raspberries and half that quantity red currants. Sprinkle over them 2 oz. castor sugar, then beat up the yolks of 3 eggs, add to them another 2 oz. sugar, and lastly stir in lightly the stiffly whisked whites. Pour the custard over the fruit, and bake the pudding in a moderate oven until it is set.

Raspberry Trifle. Spread $\frac{1}{2}$ lb. raspberries on a large dish, sprinkle them with castor sugar, and leave them for about $\frac{1}{2}$ hour, mixing with them 3 mashed bananas. Split 6 small

sponge cakes spread the cut sides with raspberry jam, then arrange them tastefully in a glass dish and soak them, first with 1 gill hot milk and then with $\frac{1}{2}$ gill sherry.

Make a pint of thick, vanilla-flavoured custard, and leave it to cool, and when the sugar has well soaked the fruit, pile the latter in small heaps on the sponge cakes. Pour the custard over them, stand the trifle in a cool place, and then decorate the top with 1 gill whisked cream, sweetened and flavoured with vanilla and garnished with chopped pistachio nuts and raspberries.

Raspberry Vinegar. This fruit vinegar is made by putting $\frac{1}{2}$ lb. raspberries into a jar, covering them with 1 pint white wine vinegar, and letting them stand for 10 days. Stir them daily, then strain off and measure the liquid, allowing 1 lb. cane sugar to every pint. Boil the vinegar and sugar together for about 10 min., taking the scum from the top, and let the whole cool before bottling it. It should be kept in a cool place.

Raspberry Wine. This wine is made by putting 6 quarts ripe raspberries into an earthenware vessel, bruising them well with a heavy wooden spoon and then pouring over them 6 quarts cold water. Let them stand until the following day, stirring them frequently, then strain the liquor through a fine hair sieve, draining the fruit thoroughly.

To each quart of liquor add 1 lb. lump sugar, stir the whole occasionally until the sugar is dissolved, and then turn it into a cask. Bung the latter loosely for several days until fermentation ceases, then tighten the bung and let it remain thus for 3 months. The wine may then be bottled for use.

RASPBERRY BUN. For this bun take $1\frac{1}{2}$ lb. flour, 8 oz. margarine or butter, 2 eggs, a pinch of salt, $\frac{1}{2}$ lb. sugar, 2 teaspoonfuls baking powder, some raspberry jam, and some milk. Rub the margarine into the flour, add the dry ingredients, the eggs (beaten) and sufficient milk to make a stiff paste. Make into about 24 buns, and place them on a well-greased baking sheet. Make a hole in the top of each, and put in a little raspberry jam, pinching the dough together about it. Bake them in a hot oven for about 15 min. See Bun; Coconut Cake; Rock Bun.

RASPBERRY GÂTEAU. This rich sweet can be made by sieving together 6 oz. flour, 2 oz. cornflour, half teaspoonful baking



Raspberry Gâteau. A rich sweet suitable for serving at parties

powder, and a pinch of salt. Rub into them $\frac{1}{2}$ lb. butter or margarine, then stir in 1 oz. castor sugar, and mix to a stiff but pliable paste, with the yolks of 2 eggs, adding milk as required. Roll the paste out to a round shape about an inch thick, line a deep, greased sandwich tin with it, brush it over with milk, and bake for 20 min. in a brisk oven.

Let it cool on a sieve, then split it into halves, and spread the inner sides with raspberry jam, fitting the two pieces together again. Whisk the whites of the 2 eggs to a stiff froth, fold into them $\frac{1}{2}$ lb. castor sugar and what remains from $\frac{1}{2}$ lb. raspberry jam, and add a few drops of cochineal. Shake the mixture on top of the cake in small heaps,



Raspberry Moth, an injurious insect pest which attacks the young shoots. Below is seen the larval form of the insect

By permission of the Ministry of Agriculture and Home Stationery Office



put the cake back into the oven so that the meringue can set, and sprinkle over it a few blanched and chopped pistachio nuts.

RASPBERRY SHORTCAKE. For this cake take $\frac{1}{2}$ lb. flour, $\frac{3}{4}$ oz. butter or margarine, 2 oz. lard, $\frac{1}{2}$ teaspoonful baking powder, a pinch of salt, teaspoonful lemon juice, and an egg. Sift the flour, baking powder, and salt into a basin, then rub in the fat lightly with the tips of the fingers. Beat the egg, pour it into the centre of the flour, add the lemon juice, and mix all into a firm dough. Knead it thoroughly, and divide it into two portions, and roll these portions into two rounds about $\frac{1}{2}$ in. thick and 8 in. across.

The paste must not be rolled out more than once, so it must be shaped during the rolling. Lay one round in a cake ring, brush the top with oiled butter, and place the other round lightly over it. Bake these in a moderately quick oven from 15 to 20 min. and let the cake cool. Strain the juice from a bottle of raspberries and make the fruit into a purée. Cream 2 oz. fresh butter, and add 4 oz. icing sugar and the raspberry purée. Split the shortcake in half, and arrange a layer of the filling between the two halves and garnish the top with the remainder of the mixture and whipped cream. Put the shortcake into a dish, make a syrup with the raspberry juice and pour it round.

RAT: How to Destroy. There are no more unwelcome visitors to a house than rats, which not only raid the larder but damage property and are notorious carriers of disease.

The two kinds of rat found in Great Britain are the black and the brown rat. The latter has increased rapidly in numbers during recent years, and is sometimes infested with fleas carrying bubonic plague. It has a tail an inch longer than its body, which is about 7 or 8 in. long. The brown rat is heavier in build and longer in body than the black variety, with a shorter tail and a coarser fur, grey-brown above and white below.

The first intimation of the rat's arrival is very often the discovery of a diggish hole beside a garden path, generally near a dustbin or the back door. If a fox terrier or other dog is kept it will often be the first to give the alarm by scraping furiously at the hole. Very often the intruder has got inside the house undiscovered, and announces its presence by unmistakable gnawings and crunchings at the woodwork. It may have visited the larder during the night, and scraps of food dragged about the floor tell their own story. The rat is not usually to be detected by smell, although he is a confirmed scavenger and may have come straight out of drains that need overhauling. Where poultry are kept the presence of a rat is soon announced by feathers lying about; eggs begin to disappear and chickens, too, unless prompt measures are taken.

Preventive Measures. One of the first things to be done is to cut off all possible sources of food supply, for rats seldom remain in any place where they cannot easily obtain food for their young ones. The practice of leaving grain or other food lying about in poultry runs encourages their visitation, and the same remark applies to refuse allowed to accumulate in gardens or back yards instead of being put away in dustbins. Where the foundations of a house are concreted and the brickwork laid in cement the building is rendered to some extent rat-proof, and preventive measures of this kind, together with the use of galvanized iron sheeting, are particularly advisable for stables, granaries, and farm buildings.

Basement windows are protected by a covering of heavy galvanized wire netting of $\frac{1}{2}$ in. mesh. Buttresses under floors from which

rats have been driven should be filled with concrete, broken glass, or crockery and cement. But the most important, as well as the least expensive, of all preventive measures is to cut off food supplies, particularly in the form of garbage, and see that the dustbin is properly covered especially at night.

Use of Poison. So far as private houses are concerned, the two principal methods of destroying rats are by the use of poison and by traps. Various preparations containing phosphorus, strychnine or arsenic are sold everywhere by chemists, grocers, and oil merchants. Many of these are in the form of a paste, which is spread on some strong-smelling food, such as a piece of kipper or bloater, a scrap of bacon or cheese.

The bait thus prepared is placed far enough down the hole to be, as far as possible, beyond the reach of cats and dogs. A point to be noted in purchasing these rat poisons is that if they have been kept a long time in the tradesman's shop the virus may prove less effective, at least in its immediate results. This explains why rats have been known to consume repeated doses of poisoned food without apparently experiencing any ill effects, and other measures have had to be resorted to.

The greatest care should be exercised in keeping these poisons where neither children nor domestic pets can get at them, or where they might be mistaken for something else, with disastrous results. Children should be specially warned not to touch the tin or box containing the poison, which should either be put away on some high shelf, or preferably kept under lock and key. It is always a difficult matter to safeguard hens unless the poison can be placed outside the run, and even then there is the risk of fowls getting out and being poisoned, while in addition birds have been known to pick up the poison and drop it inside the run.

Another Kind of Bait

A less dangerous variety of bait is provided by the use of either barium carbonate or red squill, as powder or liquid extract. An effective mixture of the first kind consists of one part each by weight of barium carbonate powder, grated cheese, dripping and fine oatmeal. The fat is melted and mixed with the dry ingredients into a thick paste. Two parts of rolled oats may be substituted for the cheese and oatmeal. A good red squill recipe is made up of 1 part of red squill, $2\frac{1}{2}$ parts of fine oatmeal or rolled oats, and $1\frac{1}{2}$ parts of dripping. Sugar is also used as an ingredient in rat poisons, another recipe consisting of 1 part of red squill and 2 parts each of fine oatmeal and castor sugar, which should be rubbed through a fine sieve and thoroughly mixed.

Liquid extract of red squill can be obtained from any chemist. The method of using it is to mix some of it with an equal quantity of cold milk, that has been boiled, add sufficient bread to form a thick paste, and lay it in saucers or tin lids in places frequented by the rats. Should only the powdered form of red squill be available, it should be mixed with bread and milk in the proportion of 3 or 4 oz. to a pint of milk. Preparations containing red squill are probably the safest to use for poultry runs.

Another method of waging war on rats is by employing a scientifically prepared virus composed of cultures of microbes. The effect of such a poison is to infect the rat with intestinal disease, which is contracted by others. This method, however, is attended by a considerable element of uncertainty, and it has the grave objection that the infected rats become carriers of the disease, with serious risk to human beings. Fumigation with sulphur dioxide gas is resorted to in warehouses, etc., but is not advisable for houses.

Use of Traps. The oldest contrivance for killing rats is by means of a trap. The chief point in its favour is that it involves no such risks as accompany the laying down of poison about a house, and when properly baited and set it very often achieves its purpose when other methods have failed. The principal varieties include the wire trap in the form of a rectangular box, $1\frac{1}{2}$ to 2 ft. in length, which opens with a powerful spring. The door of the trap is held open by a catch so as to afford access to a baited hook, and the slightest displacement of the hook, as when a rat enters and nibbles at the bait, releases the catch and closes the trap, leaving the rat a prisoner. Steel gins or toothed spring traps are in use, and also the ordinary spring trap which kills the rat when the spring is released. In the varnish or birdlime trap strong lithographic varnish is spread on a piece of card-board about 15 in. by 12 in.

It sometimes happens that a rat, after eating the poisoned bait, goes to its nest and dies there, with the result that an offensive smell invades the house. In such cases a good deodorizer is found in chloride of zinc, which should be applied in the following manner: A hole is bored as near as possible to the spot from which the evil odour is supposed to emanate. It may be necessary to use a brace and bit for this purpose. The chloride of zinc is dropped into the hole, which is then closed with a cork.

Legal Points. The legal side of the subject has been dealt with in several Acts of Parliament in recent years, as the necessity for destroying rats became more generally recognized. Under the Protection of Animals Act, 1911, restricting the use of poisons, it is a complete offence to a charge of contravening the Act that the poison was used to kill rats provided all reasonable precautions were taken to safeguard domestic animals.

A more important change was made by the Rats and Mice (Destruction) Act, 1919, by which the occupier of land or buildings is bound to take all reasonable and necessary steps for the destruction of rats and mice, and in default is liable to a fine of £5, or £20 in a case where he was served with a notice under the Act.

RATAFIA: Its Uses. This name is given to a flavouring essence made from the kernels of certain fruits, as apricots and cherries. It has an almond-like flavour, and should be used only in small quantities, a few drops being sufficient for most purposes. It can be bought in small bottles from most grocery stores, but can also be made at home.

To prepare it, pound the stones from 2 lb. marjole cherries, with 1 oz. blanched bitter almonds and a little brandy, then turn them into an earthenware jar, and pour over them four breakfastfuls good brandy. Cover the jar tightly, and let its contents stand for 1½ months, shaking them twice daily. Then strain them through a sieve lined with blotting paper, and add 8 oz. or more of white sugar-candy previously dissolved in a gill of cold water. The liquor may then be bottled for use. The ingredients may be reduced provided that the same proportions are maintained.

Ratafia Biscuits. The ingredients for ratafia biscuits are $\frac{1}{2}$ lb. ground almonds, 7 oz. castor sugar, mixed well in a clean bowl into a paste with the whites of 3 large eggs, a few drops of ratafia essence and a squeeze of lemon juice. These ingredients should be added gradually. The paste is transferred to a bag, made with stiff paper or with canvas (cornet shape), and with the bottom aperture made by cutting off the point with scissors—about $\frac{1}{2}$ in. in diameter.

The little biscuits are then forced out by simple pressure on the bag, which is properly closed at the top. They are laid out, a little apart, on paper, then flattened on top with a

wet brush and sugar dusted over. They are baked in a warm oven until nicely coloured. The paper is afterwards wetted on the back, and the biscuits removed, after which they are dried for some time in any warm place.

Ratafia Pudding. Beat up 3 eggs and put them into a pie dish, and in the meantime heat $\frac{1}{4}$ pints milk in a pan with 2 dessertspoonfuls sugar. Pour the latter when hot over the eggs, mix all well together, and add a little ratafia flavouring. Cover the surface of the custard with ratafia biscuits, and bake the pudding in a moderate oven for about 40 min., or until the custard is set.

Care must be taken in cooking that the pudding does not brown on top, and to prevent this it should be covered with a plate. The oven should be cool, otherwise the pudding will boil and cause the eggs to curdle. See Custard; Fering.

RATCHET. The purpose of a ratchet is to permit movement in one direction and not in another. The shape of the teeth and also that of the pawl may vary and may often be disguised in various forms, but essentially the principle remains the same throughout. In general, when a ratchet forms part of a mechanism, the pawl is kept in engagement with the teeth of the ratchet by means of a light spring.

The ratchet is used in watches and clocks to prevent the spring from flying backward after being wound up. In some lawn mowers a ratchet drive forms part of the gearing which rotates the knives. Another application is in the free wheel of a bicycle. Further examples are found in the ratchet brace and ratchet screwdriver. See Pawl.

RATES. Money needed to meet the expenses of local authorities, such as town and urban councils, is raised by means of a rate levied on the occupiers of all property within the district. Rates are thus the complement of taxes, the one providing the national and the other the local revenues.

In raising rates the first thing is to make a valuation of all the property in the area covered by the council.

Valuations are made periodically, formerly by local assessment committees, but now, under the Local Government Act, 1948, by inland revenue officials.

Each house and building is valued at a certain annual sum known as the rateable value. The basis on which houses are valued has been considerably altered by the Local Government Act, 1948. Formerly the rateable value was usually the rent of the house with certain deductions for repairs, etc. In future, however, the method of calculation will depend on the type of house. In some cases the rateable value will be a percentage of the cost of construction and cost of the site both on 1938 figures, less (as before) certain deductions. In other cases it will be the 1939 rent with similar deductions. The new valuation lists come into force in April, 1953. The new lists are first published as draft lists. The fact that these draft lists are completed is publicly announced and for 21 days they are open to inspection at the offices of the rating authority. Persons who object to the valuation placed on their property may give notice to the valuation officer. An appeal lies to the local valuation court.

On the rateable value the rates are assessed, being at the rate of so much in the £. For instance, if the yearly rate is 15s. 0d., a man whose house is rated at £48 will pay £36 a year in rates. The rates are collected by the local authority, being paid in some places half-yearly and in others every quarter. With the money, together with grants from the central government, the local authority meets, directly or indirectly, such expenses as education, police, roads, public health,

including health services under the National Health Service Act, 1946, and care of aged and infirm.

Where a man owns the house he lives in he is of course liable for the rates. Where a house is let, it is the tenant and not the owner who is normally liable. A rating authority may, however, in the case of houses which are let and whose rateable value does not exceed £13 (or any higher value previously in force in the district) rate the owner instead of the occupier. A provision of the Local Government Act, 1948, when brought into force, will increase the figure of £13 to £18 with a maximum of £25 for any higher limit previously in force in the district. An owner of premises which are let and who is compelled to pay the rates in this way is entitled if he pays the rates in advance to an allowance of 10 per cent, which the rating authority may increase to 15 per cent. It is also frequently arranged, even in the case of large houses, that the owner shall pay the rates. The amount in these cases is charged to the tenant, who pays a sum, every week or month, for rent which is really rent and rates together. For doing this the landlord is usually allowed to deduct something from the amount he pays in rates.

In London and other large cities flats are usually let on the same terms as small houses. The landlord pays the rates and charges an inclusive sum to the tenant. When comparing rents this important consideration should not be overlooked.

Rates are not charged on buildings that are unoccupied. The local authority can issue summonses and then distrain if rates are not paid, and in cases of bankruptcy any amount owing for rates is a preferential debt.

Societies instituted exclusively for the purposes of science, literature, or the fine arts, and supported wholly or in part by annual voluntary subscriptions are exempt from all rates, as also are churches, voluntary schools, and agricultural land and buildings.

Mines, railways, canals, docks, and most factories and workshops are rated at only one quarter of their net annual value.

In Scotland the rating system is different. There the rates are divided between the owner and the occupier, each paying about one-half. See Income Tax; Rent; Repairs.

RAT TAIL. This phrase is used for the tapering formation found on the backs of many table spoons and table forks, introduced by English silversmiths about 1660 in order to strengthen the handles of spoons. This rat tail formation, or shape, lasted for nearly a century, when it was replaced by the tongue or shell, but it has been reproduced by modern makers. See Spoon; also illus. above.

RATTAN: For Basket Work. For domestic purposes rattan cane forms a convenient material for cleaning drums, and it is also extensively used in basket making. The whole cane is used for making chairs and various kinds of strong baskets: the outer

skin is peeled off and used for caning chairs, one side of it being quite smooth and bright.

The inner portion, known as pulp or pith, is treated by machinery and drawn through holes in a metal plate, the resulting material being available in lengths of several diameters, ranging from the finest, No. 00, to the thickest, No. 15. The appearance of the prepared pith cane when made up in the form of a basket can be improved by using the minute fibres which are left on the outside. Generally the material is used quite plain, but it can be dyed or stained.

The main advantage of rattan for basket work is its length, and for this reason it is much used. It forms a most convenient material for beginners in basket weaving. Owing to its lightness the rattan is particularly adapted for making light and fancy baskets. Used in combination with raffia, it forms an excellent material for making table mats. See Basket Making; Osier.

RATTLE: For a Child. The first toy which a child receives is usually a rattle, the being something which a baby can hold, and which, when shaken, produces a noise. It is obtainable in plastic, basket-work, wood, ivory, silver, etc. A common form is a hollow ball on the end of a handle, the ball containing several small pebbles or dried peas. A variant of this is a ball encased by tiny bells. A rattle that could be improvised at home is made in the form of a bauble, a fool's or punch's head cut out of scraps of material, stuffed with rags and fastened to the end of a stick. Little bells are attached to the points of the cap and round the bottom. Another form is a tin filled with wooden beads; the tin is covered with soft material to give it the shape of a ball.

RATTLESNAKE PLANT. Also termed the rattlesnake orchid, this plant belongs to a genus of orchids botanically known as *Goodyera*. It is generally grown in stove or greenhouse, but there are two hardy species, pubescent and repens, which may be grown outdoors in a mild and sheltered position.

Pubescent grows about 3 m. high and bears white flowers, sometimes called ladder's violets, during summer, with dainty foliage of green veined with silver; it should be planted in pockets of peat and leaf-mould during spring. See Orchid.

RAVIGOTE SAUCE. Cold ravigote sauce can be made by adding 3 teaspoonfuls chopped parsley, chives, chervil, tarragon, and shallot, mixed in equal quantities, to $\frac{1}{2}$ pint mayonnaise sauce, and mixing the whole green with vegetable colouring.

To make hot ravigote sauce, boil together $\frac{1}{2}$ gill each white wine and tarragon vinegar and a chopped shallot. When the liquor is reduced to $\frac{1}{2}$ gill, pour in a breakfastspoonful of white sauce, and add also 14 dessertspoonfuls of chopped parsley, tarragon, and chervil, mixed in equal quantities. Boil up the whole, and then simmer it all a few minutes before serving. See Mayonnaise.

RAVIOLI. This is a popular Italian dish composed of noodle paste with a savoury stuffing. Directions for making the paste will be found under the heading Noodle.

For the stuffing use the following proportions of ingredients: 4 oz. cooked chicken, 2 oz. cooked ham, 1 oz. grated Parmesan cheese, 1 yolk egg, 1 tablespoonful thick white sauce or cream, 1 tablespoonful tomato sauce, 2 teaspoonfuls finely chopped parsley, salt, cayenne, grated nutmeg to well season, a few brown breadcrumbs.

Pound all the ingredients until smooth, and rub through a wire sieve. Season well. Roll out the noodle paste as thinly as possible, and stamp out rounds about 2 in. in diameter. Place a small spoonful of the stuffing in the centre of half the rounds and wet the edges.



Rat Tail. A tapering formation as seen on these two spoons.

Courtesy of Chippin & Maudslayi.

Cover each with another round, and press the edges well together. Put them in a pan of rapidly boiling salted water, and boil quickly for about 2 min., stirring gently, then boil slowly for 10 min. Lift them out with a fish slice, drain well, and place in layers in a well-greased dish, coating each layer with tomato sauce and a good sprinkling of grated cheese. Cover the top with a good layer of sauce, sprinkle with brown breadcrumbs, and dot with pieces of butter or margarine. Reheat in a hot oven for a few minutes, and serve at once. Any kind of cooked poultry or game can be used for the stuffing.

RAY: How to Cook. When smooth-backed, this fish is usually called a skate. If the surface of the back is studded with spines it is called a thornback. It should be skinned and crimped, and can then be boiled or fried, and served with a suitable gravish and shrimp or caper sauce.

As a rule the fish is purchased from the fishmonger ready skinned and crimped, but if this work has to be undertaken at home, proceed as the following manner. Cleanse the ray, reserving the liver, and remove the skin from both sides, then lay the fish flat on the board, and with a sharp knife cut off the tail and detach the fleshy parts from the same bone on both sides. Cut the pieces into long strips by cutting through the cartilaginous or horny parts. Place these strips in cold water, then turn the fish over and repeat the process, obtaining the strip thus obtained to those already in water. Lay the pieces of fish in water, changing the latter frequently until the strips appear crimped.

To boil ray, put the crimped pieces into a saucepan with sufficient water to cover them, and add 1 wineglassful vinegar, 2 oz. salt, and a bunch of parsley. Let the water boil up, and then simmer for 15 min. Drain the fish and keep it hot. Put the liver of the fish in a small saucepan, and cover it with some of the liquor in which the ray was boiled, cook gently for 5 min. and then strain. Dish the pieces of ray, cut the liver in slices, and lay over them. Pour over Hollandaise or some pungent sauce.

Slices of the crimped ray can be curled round with a small piece of liver in the centre, they can then be dried in seasoned flour, egg and crumbed, and fried in boiling fat. The liver is very rich in oil, therefore only small portions should be served with each slice. Blanch the liver before dressing it. *See Fish, Hollandaise Sauce, Skate.*

RAYNAUD'S DISEASE. The condition that is known as Raynaud's disease consists in a disordered action of the vasomotor nerves to the blood vessels, principally those supplying the extremities. By firm contraction of small arteries a part is deprived of blood and is blanched or by action of the small veins the part is congested with blood, and blue or from interference with their nutrition certain tissues of the body actually die.

Men may be affected, but women are more liable. The disease is most likely to occur between the ages of 15 and 30. It may follow the acute infectious disease, and is often associated with Bright's disease, other diseases and insanity may also play a part. Cold is the chief exciting cause. The whitening of the fingers is commonly referred to as dead fingers. *See Gangrene.*

RAYON. Generic name for any textile made from fibres that do not grow normally; more specifically a kind of artificial silk made by treating cotton linters or wood pulp in a solution of caustic soda. Of the several varieties of rayon, that known as viscose is most generally used for dress fabrics, hosiery, underwear, etc. The rayon fibres

can be mixed with natural fibres, such as cotton and wool.

Rayon is not so strong as natural silk, and being considerably weakened when wet, it is difficult to launder. But it does not shrink or become yellow after washing. Rayon does not pick up dirt readily, and is an ideal material for summer clothing. Its cost as a fabric is about one-fifth that of natural silk. *See Artificial Silk.*

RAZOR. The varieties of razor in general use, known as the hollow-ground and the safety, are made and used on different principles. One of the main distinctions is in the matter of blades. A good hollow-ground razor consists essentially of a strong steel blade, which will last a lifetime. In the safety, the blade is only one part of the mechanism, and it requires to be renewed from time to time.

In use, the hollow ground has a more or less diagonal movement, and can be applied at any convenient angle. The safety should be held in a vertical position and moved straight down.

There are various patterns of safety razor. In general they comprise a head on which the blade is secured, and a stem or handle. Some are provided with a means of stropping the blades. The blade is sometimes a solid steel one, hollow ground like the older type of razor, but is more often a very thin steel plate.

The chief characteristic of the hollow ground razor is the contour of the blade. It is thinnest in the centre, so that it has the appearance of being hollowed out. The cutting edge is slightly wedge-shaped, the back thick and strong. The width of the blade is from $\frac{1}{2}$ to $\frac{3}{4}$ in., the length about $\frac{5}{8}$ in., of which the actual blade measures $\frac{3}{8}$ in., the remaining $\frac{2}{8}$ in. being the tang.

The care of a hollow-ground razor consists mainly in keeping the edge keen by the use of a good leather strop. At rare intervals it may require setting on the stone. After use it should be laid aside for at least one day, as the test is good for the edge, which otherwise will very soon become dull. The same razor should never be used every day, nor even on two successive days. The best plan to keep them in good condition is to have at least two razors.

Sharpening the Razor. The routine sharpening of a open hollow-ground razor consists of 20 or 30 double passes on the leather side of the strop every time the razor is used, and is preferably done after shaving, so that the edge has a rest between stropping and use. The strop is hung up on a strong hook at the height of the chin from the floor, the handle is grasped in the left hand and pulled hard to keep the strop quite flat. This tension is important, as a weak pull will cause the strop to curl minutely round the blade so that the edge gets rounded instead of properly keen. With the other hand the razor is then swept boldly up and down the strop with the blade lying flat, the back pressing only lightly, but the edge firmly. The reversal at the end of the stroke is effected

by a turn of the right wrist, which lifts the edge and lays its other face on the strop as the return stroke is commenced.

During stropping a faint drag should be felt and a swishing sound heard, not a scraping noise, and the blade may emit a ringing note, but this is almost inaudible. If a strop gets accidentally gashed it is best discarded and replaced. The only dressing required on the leather is a mere touch of oil or grease, and the application should be postponed as long as the leather retains its soft pliability and its velvety appearance.

After a period of regular use and stropping, a razor loses its keenness of edge; it should then be given 10 or 12 light double passes on the canvas side, keeping a very heavy tension on the strop, followed by the ordinary work on the leather. A blade that is not restored by this treatment should be sent to a cutter for setting.

Dry shavers, i.e. safety razors without application of lather, are generally electrically operated. Cutters actuated by a small electric motor are fitted into a case that also contains the motor. When the end of the case is placed against the skin, the hairs are cut off by the moving cutters, or in some makes by a rotating blade.

A non-electric shaver has a hand-operated prime mover; in another type the blade moves across the hairs with a rocking motion imparted by the user. *See Shaving Soap.*

REACTION: In Wireless. The "feeding-back" system of amplification. Reaction is possible only with a device which has the power to magnify electrical impulses. Although systems for its use in the high and low frequency circuits of radio receivers have been advanced, it is normally confined to the detector.

A proportion of the energy is transferred back from the anode circuit to the grid circuit for further magnification by the valve. It should be understood that a detector valve of the normal three-electrode type amplifies as well as "detects." (For the purpose of this explanation, screened-grid and pentode valves used as detectors can be considered as "triodes" or three-electrode valves.)

If the "feeding back" is allowed to go beyond a certain point, a state of oscillation (q.v.) will be created. A sustained howl will result, in consequence of there being built up a "vicious circle" of self-magnification.

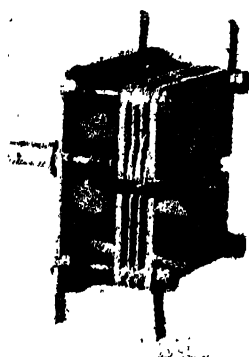
The sustained oscillation of a valve circuit through the close coupling of its anode and grid circuits is an essential factor in radio transmission. It is also used in super-heterodyne receiving circuits (q.v.), and in receivers designed for the reception of the continuous-wave signals of commercial and other wireless telegraph systems.

For obtaining additional sensitivity in a valve detector used in a broadcast receiving set, however, it is necessary widely to avoid the state of oscillation. Even a close approach to it will cause distortion of the speech and music.

In order to maintain a rigid control of "feeding back" between the anode and grid circuits of a modern set, screened grid valves and metal shielded components are used.

The reaction control with which the effect can be adjusted almost invariably takes the form of a small variable capacitor. The greater the capacitance to which this is adjusted the more the "feeding back" which occurs until the point of oscillation is reached. This will be marked by a squealing, which changes its pitch as the tuning capacitor is operated.

If the receiver has no high-frequency amplifying stage or stages, this squealing will cause interference with other listeners. Such is the sensitivity of present-day receiving sets, especially those used for short-wave reception, that any unauthorised, interfering transmission may possibly interfere with the



Reaction. Example of a reaction capacitor for wireless reception, as described in the text.

reception of listeners over an extremely wide area. See Condenser. High Frequency. Oscillation, etc.

Ream. A ream consists of 20 quires of paper. A quire contains 24 sheets, and therefore a ream contains 480.

Rear Axle. See Differential Gear; Live Axle; Propeller Shaft.

REBATE: In Cabinet Making. This is a kind of groove that is made on the edge of a piece of wood in the form of a step. An example is that found on the back of almost all picture frames. The purpose of the rebate is to provide a space in which some object, such as a panel, can be used so that its surface or one of its surfaces may finish flush with the top surface of the framework.

Generally speaking, the rebate should be used in places where one piece is to fit into, and be supported by, another. For example, boards may be rebated to a half of their thickness so that, when the two prepared boards are brought together, the rebates in each will enable both faces of the boards to finish flush and form a level surface. This is a rebated joint.

Rebate Plane. This is a tool specially made for cutting rebates. The simplest form is a narrow, hardwood plane with an iron that is the full width of the body of the plane. Useful sizes are those of $\frac{1}{4}$ in., 1 in., and $1\frac{1}{2}$ in. wide.

The plane may be made with either a skew or square mouth. The skew generally is preferred, because the shavings escape more freely, so that there is less liability of the plane choking. Such a tool, however, is not very satisfactory for the actual work of making the rebate; it is generally used for cleaning it out, after it has first been prepared with the cutting gauge or by chiselling.



To be effective, a rebate plane requires some means to prevent it from slipping sideways on the wood. The tool known as a fillister is a development of the simple rebate plane with the addition of a fence or guard to prevent the plane wandering over the surface of the wood. The fence

is a movable piece of hardwood clamped to the sole of the plane by set screws. These may be adjusted so that the width of the rebate can be regulated. A small brass shoe-piece controls the depth of the rebate, and a separate outter is provided for cutting the inner edge of the rebate. The sash fillister is somewhat similar to the moving one, but the fence is supported on two rods which slide through the body of the plane. It is used by first adjusting the fence and the stop to the requisite width and depth of the rebate. The outter is similarly adjusted, and the plane is worked along the edge of the timber, taking care to keep the face of the fence

against the edge of the job, and planing until the rebate is completed.

Another type of rebate plane, as used for cleaning up the rebate, known as the bull-nosed plane, is generally made in metal. This is only 3 or 4 in. long, and is extremely useful for all kinds of work. It is virtually a small metal plane in which the plane iron terminates on the front of the tool, so that it is possible to clean out rebates, or any other hollows, right up to the end of the slot. See Plane.

RECEIPT: In Law. A receipt is a formal written acknowledgment that a debt or bill has been paid. In Great Britain receipts must bear a twopenny stamp for £2 or over, which must be cancelled by writing across it. Any person who gives an unstamped receipt for £2 or more is liable to a penalty of £10, and the unstamped receipt is worthless as evidence if the creditor again claims the money, although it may be after-stamped within a month and so become available as evidence if the penalty is paid.

A receipt serves as evidence that a debt has been paid, but the person who gave it is always at liberty to show, if he can, that although he gave a receipt he did not receive payment, or that there was a mistake of some kind. The receipt is not conclusive against him, although a court of law would require very strong evidence for it to decide against a receipt which had been properly worded.

A receipt, however, is not necessary in English law. A debtor, for instance, cannot refuse to pay what he owes because his creditor refuses to give him a receipt, but a creditor who refuses to give a receipt in cases where the receipt should bear a stamp—i.e. where the amount is two pounds or over—is liable to a fine of ten pounds.

If the debt is paid in cash, a receipt should always be obtained, and kept for a time so that it can be produced in case a claim is made for payment. If the debt, however, is paid by cheque, a receipt is not so necessary, as it is always possible to prove that the cheque has been passed through the bank. A cheque, however, proves only that money has been paid; it does not prove that the money was paid in respect of the debt which the creditor is claiming. It is not necessary to keep receipts for more than six years, as after the lapse of that time, a debt cannot be claimed. They are, however, useful as evidence of the prices which have been paid for various articles.

Tiles for keeping receipts in order are sold by stationers and others. If they are placed on the file in the order they are received, as they should be, there will usually be little difficulty in turning quickly to a particular receipt when required. See Bill.

RECEPTION: How to Arrange. The usual form of reception is that which follows a wedding, and is given by the bride's parents or nearest relative. Invitations are issued about three weeks before the ceremony and are included in the invitation to the wedding.

Invitations for other receptions, which are merely formal "At Homes," are issued on "At Home" cards. Such receptions are given either in the afternoon or evening to introduce some specially important newcomer or guest; or by persons in an official position, such as the mayor of a town or the member for a constituency, to enable them to meet all householders or voters as

their guests, the sole qualification being that the guest should be a member of the municipality or a voter.

Such receptions are naturally large, and are usually held in some public hall or room, where light refreshments are provided. The catering is generally given out to some competent firm, which will quote a price for the numbers to be catered for and submit a statement of what that price will include. It is usual to provide some form of amusement for the guests, music being popular. The musical items should not follow each other without a pause, but at rather long intervals, and people should have plenty of opportunity for meeting each other. See At Home; Evening Party; Reception; Wedding.

RECESS: Its Fitting. In a house a recess is a small semi-enclosed space formed by a depression continued in a wall or near the junction of two walls. Typical examples occur at either side of the break-forward breast of a fireplace, and are usually terminated at their outer sides by the adjacent walls of the room. These recesses are particularly useful for the erection of fittings, as the two sides and the back are already formed by the walls. In a sitting-room shelves can be fitted in bookcases, or glazed doors can be framed and shelves provided for china and glass. For a dining room with two recesses in a bungalow or cottage, the dresser illustrated, with instructions for making, in page 358, would be a most useful fitting, with shelves for books or china in the recess on the other side of the fireplace. Corner seats with shelves above for books are also space-saving furniture ideas.

For bedrooms, cupboards are usually the best fittings, one with shelves and the other with space for hanging clothes. Such cupboards are fully described with diagrams for construction in page 326.

RECIPE. A recipe is a formula for the preparation of a mixture or compound of any kind. It is chiefly used in cooking and medicine. Directions for making cakes, puddings, sweetmeats, etc., are known as recipes, as are directions for making up medical prescriptions. Other classes of recipes are those for making up various household requisites such as glue or starch, and for compounding the scents and mixtures used for toilet purposes.

RECTIFIER. In electricity this is an apparatus for converting an alternating current into direct current. Examples are the crystal or the thermionic valve rectifiers used in wireless receivers, and the metal or valve rectifiers employed to charge L.T. batteries or provide D.T. current for receiving valves. In the latter case the rectified current is passed through a filter circuit in order to smooth out any irregularities.

Valve rectifiers may be either half-wave or full-wave. A half-wave rectifier comprises two electrodes, viz. filament and anode. If the filament is heated and an alternating current applied between the anode and filament, then current will flow through the valve during the positive half-cycles of alternating current and will cease to flow during the negative half-cycles. Thus, the valve will deliver unidirectional pulsations which can be smoothed into ripple-free direct current. By suitably arranging two half-wave rectifiers both the positive and negative half-cycles of alternating current may be rectified. This is the principle of the full-wave rectifier, in which two anodes are contained in one glass bulb.

Metal rectifiers are dissimilar metals in contact. A number of metallic plates are clamped in alternate layers, the combination being arranged so that a free passage is offered to alternations of one polarity and a path of



Rebate Plane. Fig. 1. Simple form of the plane in use. Fig. 2. Bull-nosed rebate plane.

extremely high resistance to alternations of opposite polarity. One combination possessing this rectifying property is copper plates covered with copper oxide interleaved with lead plates.

Metal rectifiers may be connected in circuit to give either half-wave or full-wave rectification and may also be constructed to supply large D.C. outputs. They require no upkeep. Other types include electrolytic rectifiers, in which two electrodes are immersed in an electrolyte (e.g. lead and aluminum in a solution of sodium phosphate), gaseous rectifiers which may take the form of a glass bulb containing an inert gas such as argon and the positive and negative electrodes, mercury-vapour are rectifiers and electro-magnetic mechanical devices. See Wireless, etc.

RED CABBAGE. This is a reddish-leaved variety of cabbage, grown principally for pickling. The finest plants are obtained

from seeds sown in August, but a sowing in March will provide useful pickling cabbages in late autumn. Blood Red is one of the best varieties.

REDCAP FOWL. This breed, which is essentially British, takes its name from the large rose comb, which in a first-class specimen measures about 5 in. by 4 in., and is covered with fine red points which are known as work. Its eggs weigh about 2 oz. each, and the cockerels when fattened are much appreciated as spring chickens. The weight of adult males runs from 6½ lb. to 7½ lb., and that of the females from 5 lb. to 6½ lb. See Chicken; Fowl; Poultry.

RED CAP PUDDING. This is identical with black cap pudding except that the currants which give the latter its name are substituted by small pieces of glacé cherries. See Black Cap Pudding.

RED CURRANTS FROM GARDEN TO TABLE

Hints on the Successful Cultivation of this Fruit

Attention may be drawn here to the articles on other fruits that can be grown in English gardens, e.g. Black Currant, Gooseberry, Loganberry, Plum. See also Jam.

The red and white currants are profitable bush fruits and their management is simple. They should be planted in autumn—at 4 ft. apart—in well tilled and manured soil in a sunny place. In the spring following planting the branches of young bushes should be shortened by about half. In subsequent years the pruning consists of shortening the side shoots in July to within about six leaves of the main branches from which they grew, and in winter pruning them again to within about ½ in. of the base of the past summer's growth. This treatment will result in the development of fruit spurs. Care must also be taken to thin out the bushes to prevent overcrowding. Red and white currants may be grown as single, double or treble stemmed cordons on a wall facing north: there the fruits will ripen later than those on bushes in the open garden. Cordons are pruned in the way already described.

Some of the best varieties of red currant are Fava Profina, New Red Dutch, Perfection, Laxton's No. 1, and Ruby Castle. Of white currants Transparent and White Versailles should be chosen.

Both red and white currant bushes are easily propagated by cuttings, 10 in. long, inserted out of doors in autumn in narrow trenches 6 in. deep: a layer of sand must be placed in the bottom of the trench and the cuttings made firm at the base. They will

be well rooted by the following autumn and may then be transplanted to a reserve plot until large enough for planting permanently.

Currant bushes benefit by a top-dressing of manure on the soil in spring, and once in three years basic slag should be put on the ground in autumn, at the rate of 4 oz. per square yard.

Pests of the Bush. Among the many pests that are harmful to red currants is the clearwing moth, which causes shrivelled foliage, the only remedy being removal and burning of affected shoots and leaves. The shoot borer bores into buds and shoots, the remedy being a spraying with caustic wash in winter and burning of affected shoots during growth. The currant sawfly defoliates bushes, and its larvae may be cleared by repeated spraying with a good insecticide emulsified in soft soap. Other pests include the maggie moth, white woolly, brown scale, and winter moth.

Currant-leaf spot is a disease appearing in the form of dirty black markings upon the foliage, shrivelling the leaves and weakening the remaining growth. Bushes thus affected should be sprayed during summer with a solution of sulphide of potassium, all fallen leaves being promptly burned. Handy preventives of currant troubles are syringing with strong lime-water, or soot-dusting in early morning while the leaves are damp with dew.

For protection against birds there is nothing better than old fish netting. When wasps are troublesome the bushes should be enshrouded in old curtains or butter-muslin.

How to Cook. When added to other fruits red currants serve to bring out the flavour, as, for example, when a tart is made of raspberries and red currants. The juice is frequently added to red fruit while boiling, and improves both the flavour and the colour.

Red currants should be stewed in a strong syrup of sugar and water.

Pick and wash the fruit and put them with the syrup in a stewpan. Let them boil up and then remove them from fire till cool. Replace on fire to boil up again before serving. Red currants are better when mixed with raspberries for puddings, tarts, or flans.

Red Currant Cream. This is made with 1½ lb. picked red currants. Put them into a stewpan, mash them with a wooden spoon and then stew them gently in the oven or over the fire until all the juice runs out. Strain the liquor through a hair sieve, measure it, and return to the stewpan. To every pint of juice add 6 oz. granulated sugar and 2 oz. gelatine dissolved in 3 tablespoonfuls warm water.

Stir all together until the sugar is melted, then boil them for a few minutes, skimming the top. Put into a basin 1 pint cold milk or cream, and when the currant juice is nearly cold, strain it in by degrees. Turn the whole into a mould to set. If the currants do not yield 1 pint juice a little water may be added.

Red Currant Ice. Use ½ lb. red and ½ lb. whitecurrants and 1 gill raspberry or strawberry puree to 1 pint rich custard, and proceed according to the general instructions which are given for making ices in pages 606-607.

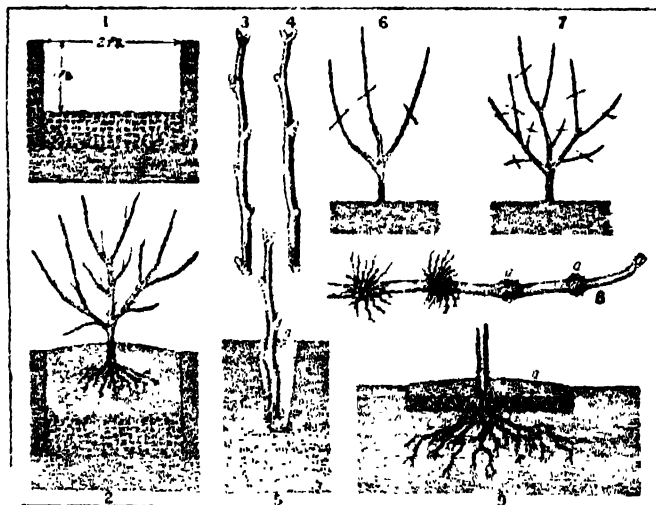
Red Currant Jam. To make well flavoured and bright coloured jam with red currants pick the fruit, which must be very dry, and put it into a preserving pan, letting it boil up, and continue boiling for 5 min. Then add 1 lb. lump sugar for each lb. fruit, and boil all together, stirring and pressing the fruit with a wooden spoon and skimming well; 35 min. should be sufficient to obtain a firm jam, but it may be tested by dropping a little on a cold plate.

Red Currant Jelly. To make this, top and tail 8 lb. red currants, and put them into a jar with 2 gills water and ½ lb. granulated sugar. Cover the jar with a saucer, put it into a large saucepan of water, and cook its contents gently at the side of the fire until the fruit is soft and all the juice extracted from it. Pour off the juice and drain it through a jelly bag, then put it into a preserving pan, adding 1½ lb. lump sugar to every quart of the fruit juice.

Boil the whole for about 40 min., or until it will set when tested on a cold plate, and in the meantime keep it well skimmed and stirred. When cold, put the jelly into dry pots, tie it down, and store it in a cool, dry place. Red currant jelly is served with hare, trout or jugged rabbit, venison and saddle of mutton; some people serve it with leg of mutton.



Red Currant. Excellent example of a cordon variety of red currant



Red Currant. 1. Soil preparation, showing bottom spit well manured. 2. Planting. 3. Good cutting. 4. The same suitably prepared. 5. Cutting planted: a, sandy soil. 6. First year pruning. 7. Second year pruning. 8. Encouraging fruit spurs (a). 9. Mulching: a, manure under top soil.

Red Currant Syrup. To make this, pick $1\frac{1}{2}$ lb. red currants and $\frac{1}{2}$ lb. white currants and put them into a bowl with $1\frac{1}{2}$ lb. strawberries or raspberries. Press the fruit with a potato masher or wooden spoon in order to crush it, and strain off the juice. Leave this to ferment for about 6 days, then strain into a preserving pan, add 1 lb. lump sugar, and boil all together, taking off the scum as it rises. When thoroughly boiled, cool it and bottle it for use.

RED HOT POKER. This is a familiar hardy perennial with large tufts of narrow leaves and dense cylindrical clusters of small, brilliantly coloured flowers on stems varying in height from 2 to 3 ft. Its botanical name is *Kniphofia* or *Tritoma*, and it is known also as the torch lily, on account of its torch-like inflorescences. The plants are hardy in well drained soil, but they are apt to perish in ground that becomes water-logged in winter. In cold districts the plants should be protected by placing bracken or other material round them. During the winter some of the leaves will be disfigured by frost and wind, they should be cut off in spring when fresh growth begins.

The best time to plant is in March or early April, if the ground is heavy, sand and leaf mould should be added. An increased stock can be obtained by division in spring, but the plants dislike being disturbed.

The common red hot poker is *Kniphofia aloides*, which grows up to 5 ft. high and bears orange-red blooms; there are many varieties of this. A few other notable sorts are *Macowanii*, coral red, 2 ft.; *Nelsonii*, yellow, $2\frac{1}{2}$ ft.; *Northamii*, red and yellow, 4-5 ft.; and *Tuckii*, yellow and red. Of the modern varieties *Royal Standard*, orange-red, 3-4 ft.; *Goldleaf*, yellow, $2\frac{1}{2}$ ft.; and *Mount Etna*, reddish, 5 ft., are very showy.

RED LEAD. Red lead is a crystalline powder known in chemistry as triplumbic tetroxide, or lead orthoplumbate, according to its purity. It has many commercial uses, of which one is the manufacture of flint glass. Its use as a pigment is common, and it forms the base of the priming coats in painting.

The mixture of red lead and gold size is a useful drier for painting; the same mixture is applied to the screwed joints of gas or hot water piping to ensure a leak proof joint. A length of tow or hemp is smeared with the paste and twisted into the threads of the pipe, which is then screwed home. See Plumbing.

RED MULLET. Superior in flavour to the grey mullet (q.v.), the small, rose-coloured fish known as red mullet can be cooked in a variety of ways. Baking and grilling are the best methods. Boiling is unsuitable.

For grilling, clean and dry 5 fish, score the skin across at frequent intervals on both sides, and then let them soak for about $\frac{1}{2}$ hour in a mixture consisting of 1 gill melted butter or margarine, $1\frac{1}{2}$ tablespoonsful lemon juice, and seasoning to taste. Turn the fish occasionally so that both sides are equally well soaked, then grill them before a clear fire for about 8 min. Serve them garnished with a few pat of maître d'hôtel butter.

To bake red mullet, prepare two large fish score them as directed for grilling, and then lay them in a greased baking dish previously sprinkled with a little chopped parsley and fine breadcrumbs. Add seasoning to taste, squeeze over a little lemon juice, finally adding some more parsley and breadcrumbs. Just before putting the fish into the oven to bake, lay a few small pieces of margarine or butter on top. The baking should take about $\frac{1}{2}$ hour.

RED SPIDER. This minute pest attacks the leaves, chiefly of plants growing under glass and on sunny walls out of doors, sucks the sap from them and, if not destroyed, seriously weakens the plants. This pest is most troublesome in warm, dry conditions;



Red Hot Poker. Torch-like red and yellow flower heads of the handsome *Kniphofia*

it can be destroyed by syringing the lower leaf surface with a solution of salt, 1 oz. in one gallon of water.

REDUCER: In Photography Negatives which are too dense or too nearly opaque to print properly may be reduced by chemical solutions, just as negatives which are too thin may be intensified. These processes are only to be used with caution by the amateur, owing to the risk of permanent damage by staining.

Attempts should always be made to get satisfactory prints from a dense negative by choosing a soft printing paper before resorting to chemical reduction. Soft grade or portrait grade gaslight paper will frequently give pleasing prints from dense negatives, which on the ordinary grade paper show harsh results.

There are three classes of dense or semi-opaque negatives, due to (1) over-development of a correctly exposed negative; (2) over-exposure and over-development; (3) under-exposure and over-development; the last, as being probably the most common with amateur photographers.

The first variety of dense negative is sometimes due to not making sufficient allowance for temperature in hot weather when developing in a tank. The negative is dense all over, though detail is clearly visible; but the shadows, which should be nearly clear glass, show a good deal of deposit, and the high lights are nearly opaque, all delicate tones being lost.

The print is harsh in contrast. Thus white dresses in portraits print dead white without detail. The best and safest reducer for such negatives is ammonium persulphate, made up as follows:

SOLUTION 1	
Ammonium persulphate	40 gr.
Cold distilled water	4 oz.
SOLUTION 2	
Sodium sulphite	20 gr.
Cold water	2 oz.

The negative having been soaked for about half hour in plain water or, more safely, in distilled water, to wet it uniformly and soften the gelatine, it is placed in a small, clean dish and about 2 oz. of solution No. 1

poured over it, rocking the dish gently. In about 2 min. the solution will turn cloudy, and reduction will have begun. The process should be observed carefully, and the negative examined at short intervals to see that reduction is not proceeding too far. In 5 min., or less, reduction should be complete, and the negative should be taken out, quickly rinsed, and at once placed in solution No. 2 for 3 or 4 min., which stops the reduction. Plain water is not effective. Afterwards wash well in the ordinary way.

On no account should the negative be kept for more than 5 min. in the persulphate solution. If one application is not sufficient, a second bath of persulphate solution may be used after the No. 2 bath and washing. It is equally important that No. 1 solution should not be used twice, nor should the negative be treated at a time. Fresh solutions must be used, or immovable stains will result.

This reducer acts proportionately to the density of the negative, i.e. it attacks the densest parts more than the thinner parts and so reduces harsh contrasts. Used as described, it is safe in operation with properly fixed and washed negatives. Do not touch the surface with the fingers during the process or permanent marks will be produced.

Clearing Dense Over-exposed Negatives

In the second variety of undue density, caused by over-exposure and over-development, the negative generally appears of almost uniform density, shadows as well as high lights, and may be even so dense that the subject can only be seen with difficulty when the negative is held up to a strong light. Long printing gives flat or foggy prints with plenty of detail. Enlargement is impossible. Here the best reducer is Farmer's solution, used fairly strong. This solution, when strong, attacks the shadows more than the high lights and so increases contrasts; when weak it acts more evenly. The property is taken advantage of by using it both strong and weak in reducing these opaque negatives.

Either take the negative straight from the fixing bath or after washing is completed, but not drying. If the negative has been dried it must be soaked for at least $\frac{1}{2}$ hour. Place it in a bath of freshly made and unused plain hypo, 4 oz. hypo to 20 oz. water, without any acid alum or other chemical as used in acid fixing salts. Make a solution of 1 oz. potassium ferricyanide in 10 oz. water. Pour the hypo off the negative, mix in a few drops of the ferricyanide solution until the solution has an orange tint.

Return the mixture to the dish containing the negative and watch the result carefully. Reduction proceeds quickly, and if details in the shadows disappear they cannot be restored. Remove the negative, therefore, while it is still somewhat too dense, and wash well in running water for $\frac{1}{2}$ hour. Reduction continues in the first portion of the washing period.

Next prepare fresh hypo and repeat the process, using less ferricyanide solution, making the mixture of hypo and ferricyanide a pale lemon tint. This second reduction will proceed more slowly and will be much more even, but must be carefully watched. The first reduction increases contrasts, the second printing qualities. The negative must finally be well washed to remove all yellow stain.

The third case, under-exposure and over-development, is most common with the amateur, and is the most difficult to remedy. In fact, it may be said that the best thing to do is to make another, but correct exposure. The negative is hard with opaque high lights, thin, detailless shadows, and poor gradations. The print shows excessive contrast.

When under-exposure is not too great, improvement can be made by using the ammonium persulphate reducer described

above, taking great care not to carry the reduction so far as to destroy what detail exists in the shadows. In this case reduction only makes the best of a bad job. Local reduction is often useful, as when the sky portion or some high light in a negative is too dense. This can be effected with Farmer's reducer, made as explained above, and applied with a camel-hair brush to the parts to be reduced after the negative has been bathed in the plain hypo solution. See Developing; Exposure; Intensifier; Photography.

REED: The Grass. The giant reed of New Zealand (*Arundo donax*) is a vigorous ornamental grass which bears pale flower plumes in late summer and autumn, on stems 8 feet or more high. The Provence reed (*Arundo donax*) which is equally tall, has reddish flowers. *Arundo procumbens* is a common waterside reed in this country; a variety with variegated leaves, *Arundo procumbens* var. *variegata*, is ornamental. The New Zealand and Provence reeds should be planted in a sheltered place in moist loamy soil, and it is wise to protect them with leaves or other covering in winter. They should be planted in spring; that also is the reason to propagate the reeds by division of the clumps.



Reed Mace. A perennial plant which is very effective in the water garden.

REED: In Moulding. As used in woodwork, a reed is a narrow convex moulding which can be worked by hand with a carving tool or a special plane, or by machinery. It is the opposite of the concave moulding, and is used as a cabinet decoration, principally on table legs and also on picture frames. See Beading; Moulding.

REED MACE. Reed mace is a hardy aquatic perennial herb bearing brown inflorescences. It is best planted at the margins of shallow ponds, lakes, and streams, during spring or autumn, and is propagated by division in February or March. The botanical name is *Typha*. Two British species are angustifolia and latifolia; these are the plants commonly called bulrushes. They may be cut in autumn for interior decoration.

REEL: The Dance. The Scottish reel for ballroom dancing is either a lonesome or an eight-step. In the lonesome two couples engage, but there may be any number of sets on the floor. The two men take up position by standing back to back with their respective partners facing them. In the opening movement the dancers trace the figure 8 with a skipping step and finish by setting to partners, when the dance is continued with variations of the two essential steps. These are the high cut or beating movement of the free leg on the supporting leg, which remains stationary with perfectly straightened knee, and a travelling, kicking step known in the Scottish as the "kick step". Both steps require the turning out of the knees, and all work is done on toes and ball

of the foot. In neither hop nor spring should the heel touch the ground when coming down. In the high cut the beating of the free leg should be on the calf of the supporting leg behind, and not on the ankle. In the travelling step a spring is made on the first beat, on the second and third beats there is no forward movement, but a closing movement with the front foot and beat behind with the back foot.

The Eightsome Reel. For the eightsome reel four couples take up position in a set as if for the Lancers. The same steps as for the lonesome are used in a modified form in the first part, but the special feature of the dance is in the second part, when each woman dances in turn in the centre with each of the four men, while the others form a ring round the couple. Then each man goes into the centre and dances with each woman in turn, and finally the first part of the dance is repeated.

The essence of Scottish dancing is the brilliance of the footwork, every step is performed with angular precision and has a perfect place in the dance. When a reel is to be introduced into a programme it is quite usual for those who intend to engage in it to practise together, as, though there are only the limited number of correct steps, the arrangement admits of great variation. The

arm work in Scottish reels should be below the level of the head, with a bend in the elbow, emphasising the angularity which is characteristic of the national dancing.

In the Irish reel the body is held erect and the arms passive at the sides almost throughout, so that nothing should distract the attention from the beauty of the footwork. The reel is a much quieter dance than the jig, the tapping movements being executed with great delicacy, and the whole effect should be of sparkling lightness. The technique of Irish and Scottish reel dancing can only be acquired by most people, after lessons from a good teacher, with a great deal of practice. Reels should be danced with spirit, but without exuberance or exaggeration. See Highland Fling; Irish Jig; Schottische.

Reflex Camera. See Camera.

REFRIGERANT. Any drink which relieves thirst and allays feverishness is called a refrigerant. Examples include lemonade and all drinks made with fruit juice or with citric and tartaric acids. Thirst may often be best relieved by demulcent drinks, such as barley water, oatmeal water, or milk and water. A free use of acid drinks upsets digestion. See Imperial Drink; Lemonade.

REFRIGERATORS FOR USE IN THE HOME

Modern Methods of Keeping Food Fresh

Our articles on Kitchen and Larder may be consulted in association with the one below. See also Ice Safe; and the entries on the various foods, e.g. Apple; Beef; Milk; Mutton; Pork.

Mechanical and other devices for reducing the temperature of the air in an enclosed space are known as refrigerators. Until recently the sole method of refrigeration or cold storage available for use on a small scale was that of utilising natural ice as the cooling agent. This system is exemplified in the ice safe described and illustrated on page 608. There are now several other systems available which are entirely automatic in action, needing simply a connexion to the electricity or gas mains, or the maintenance of a tiny jet of flame beneath the generator, according to the type of apparatus.

Refrigeration by the systems just mentioned depends upon the difference at a given pressure between the boiling point of certain volatile fluids (e.g. ammonia, boiling at 28° F. below zero, or sulphur dioxide, boiling at 14° F.) and that of water (212° F.). The process is also dependent upon the law that when the pressure applied to a liquid is raised the boiling point is raised also. In order to freeze water it must be exposed to a temperature lower than 32° F., and in order to obtain this lower temperature the water must be brought in contact with a medium (the refrigerant) which has a lower boiling point than water. To make the process continuous and automatic the refrigerant must be caused to yield up the heat extracted, and then be made available for further use.

Heat abstracted from the substance in the cooling chamber is caused to evaporate a volatile fluid circulated in pipes around the chamber. The volatile fluid is then compressed, and its boiling point thus raised, so that it can be condensed and re-liquefied at available temperature, and the heat removed. The fluid now flows back to the coil surrounding the cooling chamber, again to abstract heat from the food, etc., therein contained.

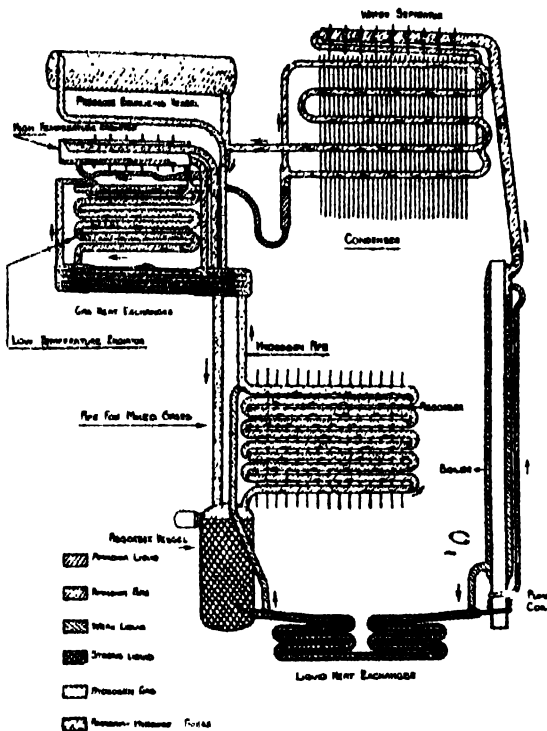
In the mechanical refrigerator the compressor is a pump operated by the electric motor. In the non-mechanical type there are no such moving parts, the necessary pressure and movement of fluids being obtained by heating the generator cylinder with a gas or paraffin flame, or with an electric element.

The cycle of operations in a non-mechanical absorption system is illustrated in Fig. 1

Heat applied to the aqueous solution of ammonia in the "boiler" liberates ammonia gas, which is then liquefied in the condenser. The liquid ammonia (as it is then) evaporates in a cylindrical vessel projecting into the refrigerator chamber, abstracting heat from the latter. The now gaseous ammonia passes next to the absorber, there to be taken up by water. The aqueous ammonia falls by gravity to the pumping coil, where the heat generates gas bubbles and so lifts the liquid through the pumping pipe to the boiler. This pumping action also causes the weak liquid in the boiler, after liberation of the ammonia, to be returned to the absorber.

The function of the hydrogen is to assist by its pressure the evaporation of the ammonia gas. The hydrogen, being freed from the ammonia gas by the dissolving of the latter in the absorber, returns to the evaporator via the gas heat exchanger. It is cooled by passing through pipes on the outside of which circulates the cold gas mixture exhausted from the evaporator. The liquid heat exchanger lowers the temperature of the weak liquid as it passes from the boiler to the absorber. The vessels and pipes forming the refrigerator unit are charged with the necessary hydrogen, ammonia, and water at the factory, and are then hermetically sealed. The condenser and absorber are cooled by air passing through the unit and a heating flame or electric element is kept in action while refrigeration goes on.

The compression refrigerator system illustrated works as follows: Liquid sulphur dioxide from the receiver is admitted to the cooling coil by an expansion valve and evaporates, extracting heat from brine surrounding the coil, and thus cooling the refrigerating chamber. The gas goes on to the compressor, is compressed and so made condensable at ordinary temperature. It is then passed through a radiator coil and changes to a liquid, being stored in the liquid receiver ready for further use. A thermostat controls the electric motor for the compressor, starting up the latter when temperature rises above a predetermined degree, and stopping the motor when the desired low temperature has been attained.



Refrigerator. Fig. 1. Diagram of absorption type non-mechanical system: the Electrolux Cooling Unit

Choice of a Refrigerator. Whether an apparatus of the absorption type (Fig. 2) or one of the compression (mechanical) type (Fig. 4) is selected depends mainly on the operative agent available to the purchaser. The former can be obtained in rather smaller sizes, and has the advantage that no motor is needed. It is slower in operation, however, and not so efficient in working as the compression type. Unless oil is used for the heater flame, the apparatus must be connected also to the gas or electric service. In the mechanical refrigerator the condenser is air cooled, a fan sometimes forming part of the apparatus. Both types are controlled by

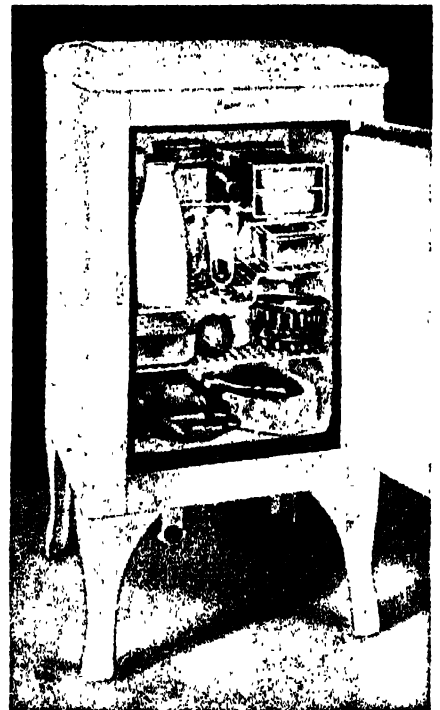
thermostats, and effective safety devices are incorporated. A gas, oil or electrically operated refrigerator will prevent waste of food in summer and in muggy winter weather. It will also enable the housewife to turn out dainty frozen dishes for the table with a minimum of trouble and expense.

With its assistance a cream or jelly can be mixed early in the day and will be set in time for lunch, or can be kept for the next day. Sundae and ice cream can be mixed and left in the refrigerator until the mixture is frozen. When making, it is a good plan to add 1 teaspoonful gelatine, which has been placed in a cup and covered with cold water, left till soft and then mixed with 3 tablespoonfuls of boiling water and stirred. Pour this amount of dissolved gelatine into every quart of milk and cream used. The cream should be whipped, and the tray containing the mixture should be removed every half hour until frozen, and the ice cream stirred thoroughly. Salads, cold pies, melon and other fruit, milk, beer and soft drinks are all greatly improved by refrigeration.

Oil operated refrigerators have made considerable progress during recent years, and have enjoyed increasing popularity, especially in country districts where gas and electricity are either expensive or difficult of access. We illustrate a model of this kind of refrigerator in Fig. 3. Points of interest are that this refrigerator is motorless, permanently silent when working, requiring no water, and running at very little cost for fuel. It operates by a small paraffin burner, which is draught-proof, odourless, and absolutely safe. Refrigerators are also available for use with Calor.

Now that first-class refrigerators can be obtained on the hire-purchase system extending over several years, for only a few shillings a week they have become within the reach of many more people. The housewife should consider the advisability of including one in her kitchen equipment, not only from the points of view of efficiency and labour saving, but also because fresh food is of more importance to the family than anything else. Every year there are cases of food poisoning, which could be avoided if proper refrigeration of food was the rule.

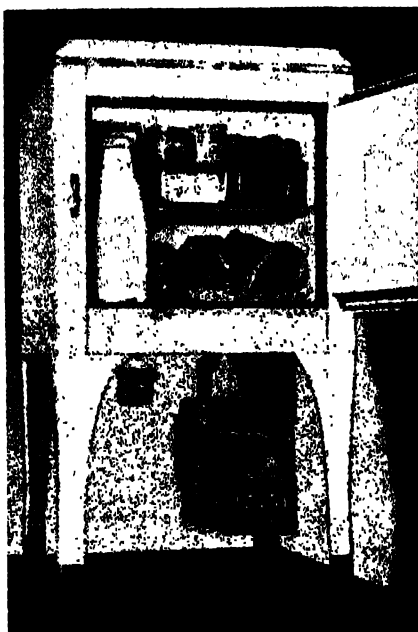
In the best models shelves are arranged to afford maximum space for storage and to ensure that milk, meat, butter, eggs, iced sweets, etc., can all be kept fresh and pure simultaneously by giving each type of food its allotted space. Choice of a refrigerator must to some extent be governed by size of family, room available for accommodation, and cost. For those who live in the country where an electric plant is not installed, a gas or oil-operated refrigerator might be selected. If a non-mechanical one is possessed which is worked by electricity and the family move to a district where such operation is not possible, the refrigerator can sometimes be adapted to use oil or gas and vice versa.



Refrigerator. Fig. 2. Small household model operated by a gas flame

Courtesy of Electrolux, Ltd.

To caterers especially the refrigerator offers reassurance; for complete meals may be prepared and stored in the refrigerator cabinet for a day, and foundation recipes for several days. Thus it is always worth while to get as large a cabinet as possible; it is itself a whole larder. The British Electrical Development Association issue booklets on the maintenance and use of electric refrigerators.



Refrigerator. Fig. 3. This little oil refrigerator suits a very small house or flat. It can be hung on the wall without the legs, which are detachable

Courtesy of Electrolux, Ltd.



Refrigerator. Fig. 4. Large compression type apparatus operated by electricity

Courtesy of H. M. V. Household Appliances

A refrigerator requires regular attention to keep it clean and free of excessive frost. The latter gathers inside the cold box, and should be periodically removed according to the maker's instructions. To keep the refrigerator spotlessly clean the interior should be regularly washed out with a weak solution of bicarbonate of soda and water; never use strong disinfectants, because these are likely to contaminate the food. The outside of the cabinet should be wiped over with a clean dry cloth. The door should never be left open longer than is absolutely necessary, and the rubber or other packing between door and cabinet should be examined regularly to see that it is still upright.

REFUSE: Its Removal. This term includes excretal refuse from house and stable, ashes, dust, waste from food, street sweepings, and trade waste.

All forms of refuse are likely to cause a nuisance or encourage disease if kept stored in or near the house for too long a time. For this reason the householder has a clear duty to see that the storage and disposal of refuse is carried out on hygienic lines. The quantity of refuse stored on the premises should be reduced as much as possible by turning the easily destructible refuse every day. Vegetable and food scraps generally should be dealt with in this way, as they are particularly prone to give rise to trouble by decomposition.

The material that is not burnt should be stored in a hygienic type of metal ashbin with a well-fitting cover. The latter should always be kept in place to prevent the refuse from being blown away by the wind, and also to protect it from rain, as dampness favours decomposition. The contents should be removed at least twice a week if possible. Horse manure should be removed frequently from stables. Nuisance from smell and flies is often caused by this form of refuse, but can be reduced by storing the manure in the cart in which it is to be removed.

In country districts, where refuse is frequently dumped on the land, care should be taken to see that the refuse is well covered by at least 6 in. of soil until it has been well purified by natural means, otherwise nuisance from smell and flies will result. Excretal refuse must be treated with particular care, and where a cesspool system is in use it should be kept in good order, and care taken that any water supply in the neighbourhood is not polluted thereby.

The practice of disposing of house refuse by dumping it on the surface of waste-land and so making a shoot is not to be recommended, unless it is strictly controlled by the local authority. What is known as the Bradford System is the best form of controlled tipping. This is successfully carried out in many large towns without causing any nuisance, and at a very great saving to the ratepayers. The main feature of this system is that the refuse is tipped in layers about 6 ft. deep to proper levels. Care is taken that all this and hollow receptacles are filled up solid. At the close of the day's work all refuse is covered up with soil or road sweepings about 6 to 9 in. deep. Special care is taken with any fish offal or other foul matter, which is buried deeply. Screens are provided to prevent light materials from blowing about.

There is no doubt that the most sanitary way of disposing of house refuse is by burning it in some form of destructor. Excretal refuse in most towns is carried away by the drains to the sewer, and so to special sewage works.

Duties of the Local Authority. The collection and removal of house refuse is a duty that devolves upon the local authority in every district. It is usually assigned to the sanitary department in towns and cities, and a staff of dustmen is employed for the purpose, who go

from house to house with the dust carts. Ashpits are cleared by the dustman without assistance, but in some towns the householder is expected to get his dustbin taken out into the street and put back in its place after it has been emptied. It is not an ideal or sanitary method, since people must pass rows of dustbins on the pavement, often standing in the hot sun. Fortunately this practice is rapidly dying out.

Should there be any neglect or omission to clear a dustbin or ashpit, as may occur where a tenant has just come into a house that has been empty for some time, the sanitary authority should be at once informed in writing, as they are bound by law under a penalty to make the necessary arrangements. The tenant on his part should ascertain the time at which dust is collected in his neighbourhood, and make arrangements accordingly.

Open dust carts without protection of any kind are still employed, but the closed or partly closed type now used in many towns is more hygienic, as it involves little or no risk of dust being scattered about the roads in stormy weather. The unsanitary, high dust cart is rapidly giving way to the motor dust van with a low loading line. Many of these have automatic covers to secure dustless loading.

It should be noted that local authorities are only bound to remove house refuse; where a trade is carried on, and there is nothing in the nature of domestic work associated with it, responsibility for the removal of the refuse rests with the person who is carrying on business on the premises. It is not always an easy matter to decide in which

category a given case may fall, and litigation has been necessary to clear up doubtful points. Thus, clinkers from a steam laundry are trade refuse, but those from an hotel are house refuse; but most authorities make arrangements to remove on payment of a small fee.

Garden rubbish should not be put in dustbins, although this is frequently done; if the quantity is not excessive the dustman may take it if he chooses, and as a rule there is no difficulty, but with large quantities the occupier must arrange for the removal as if it were trade refuse.

A better way of disposing of garden and other similar refuse is to burn it in an incinerator. See Cesspool; Drains; Dustbin; Incinerator; Rubbish; Sanitation; Sewage.

REGENCY STYLE. In furniture decoration and architecture this is the term employed for designs created between (about) 1795 and 1830. Regency style was an offshoot of Empire style and the designers were the modernists of the late Georgian period, though they were influenced by the work of Sheraton and Robert Adam. Regency style at its best was a wholesome revulsion from the trivial debased ideas borrowed from French

furniture of the worst school which had become fashionable at the end of the 18th century.

An archaeological revival produced the Empire style in France and its English derivative. An attempt was made by the leading designers to adapt Greek, Roman and Egyptian types of furniture and architectural features to contemporary use. Classical influence had largely swayed the Adam designs, but the Regency adaptations were on heavy simple lines and some connoisseurs consider that beauty of form is rare in pieces of this period except in those which show direct development from the Sheraton school and in some of those designed by George Smith.

The originator of the Regency style in



Regency Style. Fig. 1. Chair-back settee, a combination of four chair backs with cane panels. Fig. 2. Armchair, showing typical brass inlay decoration.

Courtesy of Our Homes & Gardens

England was Henry Holland, architect to the Prince Regent and designer of Carlton House. He applied detailed drawings of Roman fragments to designs for furniture, etc., and the work produced from these belongs to the more graceful examples of Regency style. The most characteristic work, however, was the result of designs made by Thomas Hope, who, besides other sources of classical inspiration, drew on the cult for Egyptian designs which were the vogue in France, in 1804, after Napoleon's invasion of Egypt. In 1807 he published a book entitled "Household Furniture and Interior Decoration," which contains illustrations of the pieces most sought by collectors of Regency furniture.

Rooms were usually papered, marbled effects made to resemble blocks being particularly liked and classical designs were popular on satin papers. Borders and mock pilasters were used. Marbled paper pillars, tinted to appear round were another feature, while doorways were sometimes grained to simulate rose and green marble. Pelmet and curtains were severe in form; heavy satins, striped fabrics, and silk damasks were used for these and for upholstering furniture. Pictures were hung by tasseled cords instead of wire.

The association of strongly figured woods with inlay of brass and bronzed metal is characteristic of Regency furniture. Amboyna wood and zebra wood were used as veneers for secretaries and cabinets which were often enriched at the corners by Egyptian terminal figures with heads and feet of oryx. Mahogany and rosewood pieces were frequently decorated with gilded carving. English cabinet making of this period was of a high standard.

Chairs of this style commonly have a scroll-over back, and the legs splay out in a curve.

The *settee* illustrated is characteristic of the solid type of furniture made during this period, while the armchair shown in Fig. 2 is an example of the lighter style and is decorated with brass inlay. The seats and backs are in some instances of cane mesh. Circular tables, supported by a centre pillar and four splayed-out and curved supports, were made, and sofa tables with two end supports having yoke-shaped feet were introduced. *Reeding* was a favourite decoration. Towards the end of the period the short fluted straight sofa leg displayed the splayed support. Regency and Empire style frankly inspires certain modern designers and is particularly suited to the formal houses built at about this period. A very simple adaptation for a small dining-room is illustrated and described in pages 359-360. See Empire Style; Sheraton Victorian Style.

REGISTRATION. In Great Britain certain facts must be registered—i.e., an official record of them must be made and kept in some public place. Such are births, marriages and deaths, which must all be registered with a registrar appointed for the purpose. Names used for business purposes, if they are not the exact names of the persons using them, must be registered. There is also a scheme in practice for registering the title to land. Letters and parcels can be registered for safety. Motor cars and motor cycles must be registered. See Birth; Death; Marriage; Motor Car; Motor Cycle; Postage.

REGISTRY OFFICE. This name is given to a shop or other place of business that serves as an agency for engaging domestic servants, governesses, etc. Usually those requiring servants pay a fixed fee on entering their names and stating their requirements, and a further sum, which is a percentage on the wages given, when they are suited. Servants are not charged.

REHMANNIA. This is a herbaceous perennial, 2 or 3 ft. high. It is hardy in well-drained soil in the comparatively mild southern and western counties, and in summer bears rosy purple flowers somewhat resembling those of the foxglove but having a pronounced "lip." A variety named *Pink Perfection* is usually preferred to the typical kind because of its more attractive colouring. *Rehmannia* thrives in ordinary non-clayey garden soil with which sand and leaf-mould or peat have been mixed; it is an excellent pot plant for the cool greenhouse. Propagation is by seeds or division in spring. The seedlings must be raised under glass.

REINS. The reins are part of the harness of a horse, being used to hold it when it is ridden or driven. They consist of two long straps of leather; one end is fastened to each side of the bit and the other is held in the hands of the rider or driver, who is able by this means to control and direct the movements of the horse. Reins are sold by saddlers and should be kept clean and bright by polishing. See Driving; Harness.

REJECTOR: In Wireless. The technical term applied to one form of the device more popularly known as a "wavetrap." The other form is an "acceptor."

The purpose of a wavetrap is to reduce the interference with reception caused by a powerful broadcasting station. In view of the greatly increased selectivity of many modern wireless receivers, wavetraps are much less often required to-day than in former years. For instance, it is seldom that a receiver employing a superheterodyne circuit requires the aid of such a device. However, with certain of the simpler and cheaper receivers there may be instances when a wavetrap would perform a useful service.

The acceptor type comprises a coil and variable capacitor joined in series across the aerial and earth terminals of the set. At signals of the frequency of this acceptor circuit (the value of which will depend upon its inductance and capacitance) an easy path from the aerial to earth is formed. Thus the circuit readily accepts the frequency to which it is tuned and by-passes it to earth, leaving the desired signals free from interference to pass on to the set. This type is not, however, as effective as the rejector. The rejector type also comprises a coil and variable capacitor, but in this instance they are joined in parallel and then placed in series with the aerial. In other words, the aerial of the set is connected to one end of the coil and the other end of the coil is connected to the aerial. The variable capacitor is connected across the two ends of the coil. This rejector circuit presents a high resistance to H.F. currents of the frequencies to which it is tuned, while permitting others to pass with relative freedom.

Therefore, having adjusted the device to oppose the passage in the aerial circuit of the energy developed by an interfering station, the set can be tuned in the normal way without further reference to the rejector.



Rehmannia. The rose-purple flowers of a plant suitable for the greenhouse or for out of doors in mild districts

In practice, it is generally found that the strength of the signals of stations close in frequency to that of the interfering station is reduced to some extent by the rejector. On the other hand, a complete rejection of a very powerful local station is not always possible by means of a rejector or trap alone. There may be a direct "pick up" of that station on the tuning coil or other component of the set.

For rejecting any one station on the medium wave broadcasting band, a coil of 60 turns of wire on a tube $2\frac{1}{2}$ inches in diameter and a 0005-mfd variable capacitor can be used.

RELAPSE. By a relapse is understood a repetition (not a complication) of an illness, or at any rate of certain characteristic features, such as fever, occurring after the original illness is passing away and the patient is entering upon convalescence.

A relapse in scarlet fever may be expected in about one case in four hundred.

In cerebro-spinal meningitis several relapses may occur in the same patient, and one may ultimately prove fatal. Serious relapses in diphtheria, measles and typhus fever are very rare. In erysipelas, on the other hand, a relapse is quite a common event, and may be repeated several times.

Although there is no sure way of preventing a relapse in the infectious fevers, skilled

nursing, medical care, attention to hygienic details of treatment and proper dieting are undoubtedly of value in minimizing the risks of a relapse.

RELAPSING FEVER. An acute infectious fever, which is liable to a relapse or a series of relapses with intervening periods free from fever, is, on this account, known as relapsing fever. The disease has occurred in epidemics in Great Britain and Ireland. Its incidence is favoured by overcrowding and want, and from the latter circumstance it was also known as famine fever.

RELAY. This is an electrical device usually comprising an electric magnet having an armature which is arranged to close a switch in a local circuit when relatively weak electric current flows through the magnet windings. One basic hold application is in the wiring of burglar alarm.

Electrical machinery, not except in the event of excessive current or of electric fault or failure operates a switch or circuit breaker to isolate the faulty section. See Bell.

RELISH: In Cookery. A dish is any savoury ingredient calculated to give a piquancy to plain or tasteless dishes. The term is applied also to special dishes which give a zest to the appetite. Pickles, sauces, chutney and other condiments are considered relishes, and are added to meat and sauces to enhance the flavour. See Chutney; Cocktail; Condiment; Dressing; Densies; Pickle; Sauce.

REMOTE CONTROL. This is a device for operating electrical apparatus at a distance. A locally controlled relay is usually used to make or break the main circuit of a machine or installation. See Relay.

REMOVAL. When a move to another house or flat has been decided on, it is advisable to obtain estimates from several firms of removal contractors. Representatives will call at the house and make a calculation of the quantity of goods that has to be dealt with, and on their reports the estimates sent in by the firms will be based.

It is always best to deal with a firm which has a staff large enough to cope with all emergencies and experienced in the careful handling of all kinds of domestic furnishings. They will probably have fixed scale charges, and their estimate will include all the costs of packing, removing, unpacking, carrying furniture upstairs, fixing overmantels, etc. They provide their own packing cases, and take full responsibility for the goods while they are in their charge and which have been packed by their staff.

The sum charged depends largely on whether the goods can be packed into a single van or whether two or more may be required. It is advisable to sort out and dispose of all rubbish before moving, both on the score of less property to remove and of the opportunity afforded for getting rid of useless possessions.

Preliminary Arrangements. Before the removal there are various matters connected with the new house that should receive attention. Plumbers should be overhauled to see that all the taps and pipes are in working order. Roof gutters may need cleaning out, and the eisterns should be tested. Perhaps a new gas cooker is required; a gasiser may have to be installed and new gas fires. As this work may entail fresh pipes it should be finished before removal.

Where electricity is used the fittings should be decided on and all electrical work done before decorations, which also should be completed as far as possible before the furniture is brought into the house. Another labour-saving point worth noting is to have

carpets cleaned and delivered at the new home in time to be laid before the furniture is placed in the rooms. This does not apply to stair carpets, rugs or small carpets. The first would have too much traffic over them and the others are easy to lay and no heavy furniture need be placed on them. Linoleum may also be fitted and laid wherever necessary. The house will, of course, have been thoroughly cleaned when the decorators have finished their work.

Curtains and blinds may also be put up when the windows have been cleaned. Sometimes the incoming tenant arranges to take over such fixtures as pelmet boards, curtain poles and rods, blinds, lighting fittings and linoleum, and this also facilitates removal. If these preparatory arrangements are all properly attended to and personal belongings are carefully packed in drawers of wardrobes and chests and well covered over, it is surprising how quickly a new home can be settled.

Packing Smaller Articles. Where there are many ornaments and much plate, china and glass, these things are usually packed the day before the removal under the supervision of the foreman. In any case packing cases are provided for smaller articles and pictures and for books. Large pictures should be protected by plenty of thick wrapping paper and moulded frames by sacking. The firm will naturally only be responsible for goods packed by their own men, so that while it is always advisable to mention articles of particular value, it is best to leave the actual packing of them to the foreman.

Kitchen utensils and gardening implements are generally put in last. The former are packed in cases, with the exception of things which will be immediately required and which are best placed in a special box, so that they are easily got at on arrival. When the furniture is being taken out, wardrobes and sideboards may be unscrewed and removed in sections if necessary, and this is the safest plan where heavy furniture is concerned, as well as the most convenient. The leaves should always be taken out of a dining table and the table firmly screwed up to its smallest proportions, otherwise the screw underneath is

liable to become strained or warped in transit. Trouble with the piano depends mainly on its location in the house. If it has to be fetched down from an upstairs room careful handling is required not to damage walls and banisters; should there be sharp corners to negotiate, it may have to be taken out through a window, and an extra charge is made by the firm for the necessary apparatus.

On arrival at the new premises the contractor's men look to the mistress of the house for instructions as to where all the things are to go, so it is always best for her to be on the spot. Besides directing the disposal of the furniture, she will also see that any heavy pieces which were removed in sections are properly screwed together again, and that mirrors etc. over fireplaces are fixed in position.

When the removal involves a railway journey from one town to another the work of packing has to be very efficiently performed if breakages are to be avoided. Not only ornaments and small articles, but every piece of furniture requires to be carefully wrapped up and all edges and corners protected with straw or other material. Mirrors and the more delicate pieces of drawing-room furniture need special attention, so that the packing up takes longer to complete. The journey is made by goods train or motor vans, the contractors making all the necessary arrangements.

Legal Points. The important point for the householder to remember is that goods in transit are carried by the railway at the owner's risk, and, however carefully safeguarded, they are exposed to the risk of fire, whether in the goods yard or on the journey. It is therefore false economy not to take out an insurance policy covering the risk of fire while the furniture is in transit. Another point to note is that when more than one firm are engaged in the removal the householder should specially stipulate for an inclusive estimate, that is to say, an estimate which covers any charges made by the firm at the other end. *See Electricity: Fixtures. Lease-Rent. Warehousing, etc.*

REMOVE: The Course. A remove consists of the substantial dishes of the meat

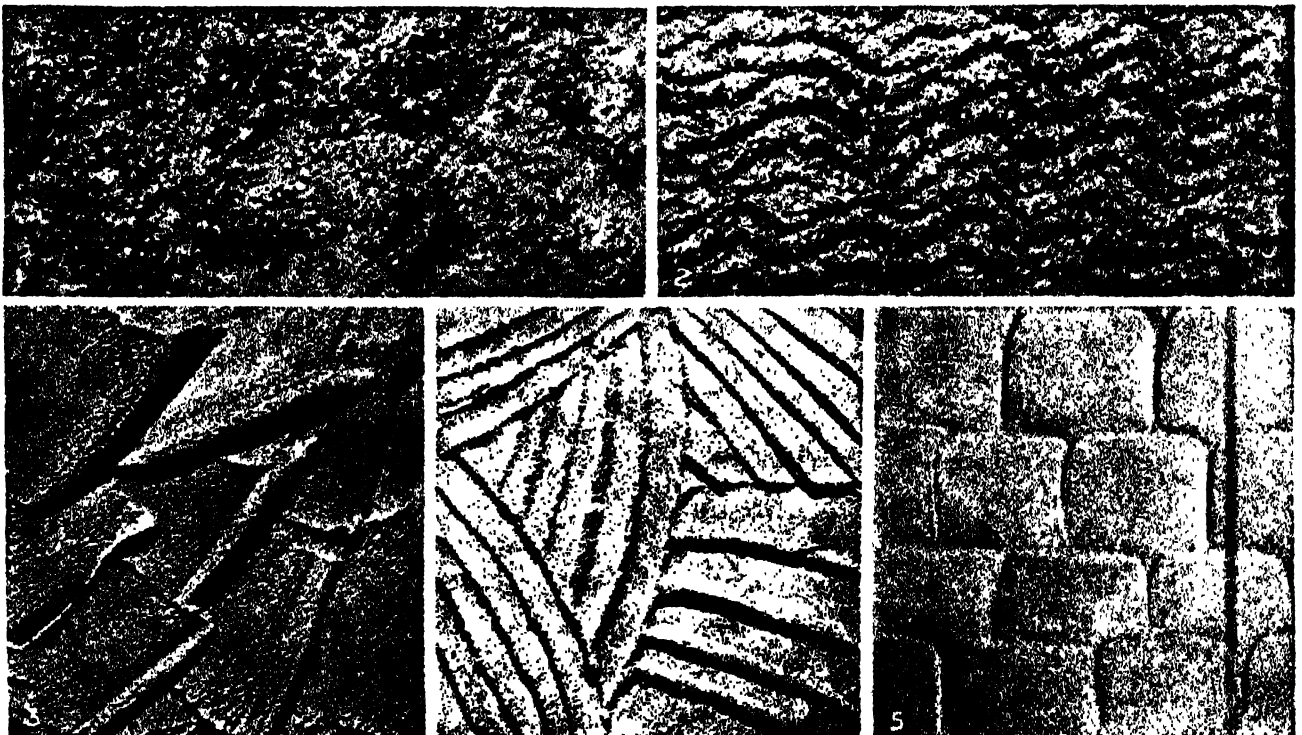
course. Roast, boiled, or braised whole joints are removed, also beef à la mode, larded fillets of beef or veal, saddle of mutton, haunch of venison, or braised ham, etc. The remove follows the entrée.

RENANTHERA. This epiphytall orchid, shy blooming and suitable only for culture in a stove house, may be grown on blocks of wood as described for other species in the article on orchids. It requires a minimum temperature of 60°. The growing period is from March to October, when roots require syringing twice daily. Plants rest during the winter period, and then require less moisture at their roots. *See (Orchid)*

RENDERING: With Mortar. Rendering consists in covering the surface of brickwork or other structure with a coat of Portland cement mortar. The rendering coat applied to the exterior of a house makes it more resistant to the weather. In a cement water tank the rendering keeps the water in the tank, or it may be used on the walls of a cellar to keep out damp. Rendering is often carried out for no other reason than to produce a smooth, impermeable, hard surface, an example of this being in the internal walls of a kitchen or of a scullery.

The amateur will find that rendering with cement mortar is particularly beneficial to house property. The procedure to be followed must be guided largely by the nature of the work. In the case of small work, such as the brickwork immediately surrounding a trapped gully at the outlet from the sink, it suffices to daub the wall with cement mortar, applying it with a trowel and smoothing it off. With a large area, as, for instance, the whole of the exterior walls of a house, the rendering coat is kept uniform in thickness with the aid of screeds.

These are battens of wood about 2 in. wide and 1 in. thick, nailed to the wall to act as guides. They should be placed not more than 10 ft. apart, and set vertically with the aid of a plumb-line. Some horizontal screeds should also be put up. These can be kept straight by stretching a light line from one end of the building to the other, and adjusting the screeds until they are exactly parallel with it.



Rendering. Fig. 1. Preliminary spatter dash coat to provide a key on brickwork. Fig. 2. Combing to furnish key for second coat. Figs. 3-6. Various surface finishes. Courtesy of the British Portland Cement Association Ltd.

The screeds should be packed up so that the back of them is about $\frac{1}{2}$ in. away from the normal wall surface, as this is necessary to provide for the first coat of mortar being worked underneath the screed. The screeds are removed when the first coat has set. Another plan that is sometimes adopted is to make the screeds in strong cement mortar by working them up until they are flat and true, and then allowing them to set hard. The wall surface at this stage has a series of ridges upon it both vertically and horizontally, the upper surfaces or tips of the ridges being on a level and true. In either case, the surface of the screed is used as a guide when finishing off the rendering coats.

Rendering on Brickwork. With brickwork it is first necessary to rake out all the joints between the bricks and also to hack over the surface of them to roughen them so that they act as a key for the first rendering coat. In new brickwork which is intended afterwards to be rendered, facing bricks are often used which have a serrated surface. Another method of providing a key is to apply a spatter dash coat of cement and sand (1 part sand, 1½ parts coarse graded sand, and 1 part water, all measured by volume). This is dashed on to the brickwork, leaving an uneven surface (Fig. 1). The spatter dash coat is left to dry for a couple of days.

Before applying the first coat, the face of the work is brushed down to remove the dust, and the bricks are roughly wetted to assist the adhesion of the mortar. The mortar may be prepared on a banker, or platform of wooden boards, in the proportion of one part of Portland cement and 4 parts of sand, for the first or rendering coat. The sand must be good, clean and sharp, and free from salt and earthy matter.

The proportions are obtained by measuring in bulk, using a pail or rough box for the purpose. The sand is measured up first, putting it on the banker, and then measuring up the amount of Portland cement. This is put on top of the sand, and turned with the shovel two or three times. The remainder is stirred in with the shovel. Water is added and the whole mixed to a working consistency. It is applied to the brickwork with a large trowel, working as quickly as possible, filling the whole of one of the spaces between the screeds, working off the surface to an approximate fair surface, and truing it up and straightening it by means of a floating rule.

The work proceeds until the whole of the required surface is covered. The second or finishing coat is applied usually about $\frac{1}{4}$ in. thick, and should be composed of 1 part of Portland cement and 2 parts of sand, both measured by bulk. The same grade of sand should be used in the finishing as for the rendering coat. The finishing coat should be applied to the rendering coat as soon as the latter has set, but before it is too dry, otherwise the finishing will not adhere properly. A key is needed for the second coat and this is effected by combing the surface of the backing coat when the latter has commenced to dry out and harden. The indentations should be about $\frac{1}{2}$ in. apart and not more than $\frac{1}{4}$ in. deep (Fig. 2).

The surface is generally finished with a hand float, made of pine or other soft wood; in better-class work it is brought first to a uniform face with a traversing rule, and then finished with a hand float. During the finishing process the surface of the mortar must be kept wet with a brush, working up the face with the hand float in a kind of circular motion, as this tends to eliminate inequalities on the surface. This process is often known as scouring; in addition to keeping the surface clear, it has the effect of hardening and consolidating the face.

Finished in this way the mortar will dry out with a closely grained, compact, and smooth

surface. If desired, it can be relieved by jointing, that is, by forming lines on the face about $\frac{1}{4}$ in. wide and $\frac{1}{4}$ in. deep, ruling them with a jointer. Other surface finishes are by various methods of trowelling (Figs. 3-5). Alternatively, the work, if brought to a smooth level surface, may be painted with one of the branded paints specially prepared for concrete and cement work. The ordinary paint is useless under these conditions. If it is desired that the surface shall be waterproof the best plan is to use a recognized waterproofing material, which is generally obtained in powder form, and should be thoroughly mixed up at the time of preparing the mortar. See Cement; Dump; Mortar; Plaster.

RENNET. This is used in order to obtain a curdled condition of the milk. It is also

employed for a similar purpose in making junket and curds and whey. Rennet is prepared from the stomach of a newly killed calf. The stomach is thoroughly cleansed with salt and then drained for 3 or 4 hours. Afterwards it is stretched and well salted, and kept in the salt.

A very small portion of rennet is sufficient to curdle a gallon of milk, and all that has to be done is to cut off a little piece, soak it in warm water, and add about 1 dessertspoonful of the rennet liquid to 1 quart of milk.

Rennet is prepared and sold ready for use in either tablet or liquid form. With a good make of prepared rennet the best results can be obtained. Several acids will produce curds in milk, but for sweet dishes rennet is by far the best. See Cheese; Curd; Junket.

RENT AND THE RENT ACTS

The Legal Relations Between Landlord and Tenant

Agreements; Distraint; Landlord; Lease; Rates, are a few of the other articles that touch upon the subject of rent. See also Furnished House; Ground Rent; House; Removal; Repairs.

Rent is the money paid for the use of houses or land. It is usually paid either weekly, or monthly, or quarterly, although landlord and tenant are at liberty to make any other arrangement about it. For nearly all the smaller houses in the country rent is paid weekly, the collector calling for it on Monday or Tuesday of each week. For the larger houses it is paid quarterly. Monthly payments are less common, but in London many persons pay rent for houses and flats by monthly instalments.

Furnished houses are usually let at a rent calculated by the week, but in this case it is not, as a rule, paid weekly. This division between weekly and monthly or quarterly corresponds roughly to the division between salaries and wages.

The tenants of small houses usually pay rent and rates together, the weekly payment covering not rent only but also rates. The landlord in such cases pays the rates from the money he receives. A number of flats are let on the same principle of an inclusive rent, as are most furnished houses. The landlord is obliged to show the amount he pays in rates, and under the Rent Restriction Acts he can increase the rent in order to cover any increase in the rates. Conversely, he must reduce the rent if the rates are reduced.

The weekly rent paid by the tenant of a small house covers also any income tax which the landlord may have to pay on the property in question. In the case of larger houses, the tenant pays this, but he can deduct the amount from the rent, and the landlord, if he is not liable to pay income tax, can recover it in the usual way.

Rent is not due until the midnight of the day upon which it is reserved to be paid, e.g. if rent is payable on Midsummer Day it is not payable until midnight of June 24. Therefore it is not overdue until after midnight, and cannot be distrained for until it is overdue. At common law landlord and tenant may agree on whatever rent they please.

Since the 1939-45 war the rights and duties of landlords and tenants of many houses and flats have been governed by various acts of Parliament which override any contract made between them. The main effect of these acts is to impose restrictions on the landlord's right to recover possession of the premises let furnished or unfurnished. The law is now in a state of great complexity.

Unfurnished Houses and Flats. Between the wars, the act which applied to unfurnished houses and flats was the Rent Restriction Act, 1920, and as there are many houses still governed by this act it is necessary to consider it. It applied in general to every house or flat or part of a house or flat (even one room)

let as a separate dwelling where either the standard rent (usually that on August 3, 1914) or the rateable value was not greater than £105 in London, £78 elsewhere in England and £90 in Scotland.

Neither the Rent Restriction Act of 1920 nor that of 1939 covers council houses, furnished houses, or rooms where attendance is provided; provided always that the furniture or attendance forms a substantial part of the letting. A house is none the less a dwelling house because part of the premises is used as a shop, office, or other business or professional purposes, but the acts do not apply to premises let for business purposes only.

Between 1923 and 1939, as the housing situation gradually improved, control was removed from certain houses. Until immediately before the outbreak of war in 1939 no house, with a very few exceptions, was controlled by the act if the rateable value exceeded £35 in London or Scotland or £20 elsewhere. It did not follow that every house below these limits was within the acts. It might for example have been decontrolled - i.e. taken out of them by the landlord having recovered possession of it on the tenant leaving and having registered it as decontrolled with the local council.

Effects of 1939-45 War

When war broke out in 1939, all houses with the exceptions set out above were brought under control if the rateable value did not exceed £100 in London, £75 elsewhere in England and £90 in Scotland. Houses which were controlled by the 1920 act immediately before the outbreak of war remained (and still remain) controlled under the provisions of that act and are called old-control houses. The houses which were not controlled immediately before the outbreak of war but became controlled under the provisions of the 1939 act are called new-control houses. The provisions of the 1920 act and 1939 act are in the main the same but as there are some important differences anyone who wishes to know what his rights are as landlord or as tenant must first ascertain in accordance with the rules outlined above whether his is an old control house or a new control one.

Recovery of Possession. This applies to both old control houses and new control houses. A landlord cannot recover possession without court proceedings and the court (which is the local county court) will not give him possession unless the landlord proves that the case falls within one of ten special classes provided for in the acts. Even if the court is satisfied that the case falls within one of these classes it is not bound to give the landlord possession and will only do so if in all the circumstances it considers it reasonable to do so. This point should be well kept in mind in

every case. The ten special classes under the acts are:—

(i) Where there is suitable alternative accommodation available for the tenant. A certificate from the local housing authority that they will provide suitable accommodation is conclusive on this point and is sometimes given when possession is needed for redevelopment. Apart from such a certificate the landlord himself may prove there is suitable alternative accommodation, but the alternative house must either be within the act or be let on terms giving equal protection to the tenant. In general it must be reasonably suitable to the tenant's means and the needs of himself and his family as to nearness to place of work, size, and character.

(ii) When the tenant is in arrears with his rent or has broken some term of his tenancy.

(iii) When the tenant, or his sub-tenant, or lodger, or someone residing with him is guilty of conduct which is nuisance or annoyance to adjoining occupiers or has been convicted of using the premises or allowing them to be used for an immoral or illegal purpose or the condition of the house has deteriorated through waste or neglect.

(iv) Where the tenant has given notice to quit and at once the landlord has contracted to sell or let the house or has taken other steps as a result of which he would be seriously prejudiced financially or otherwise, if he could not obtain possession.

(v) Where the tenant without the landlord's consent has at any time after September 1, 1939, for new control houses or July 31, 1923, for old control houses assigned or sublet the whole of the house or sublet part of it, the remainder being already sublet.

(vi) Where the house is premises with an offence for the sale of intoxicating liquor and a licensing offence has been committed or the licence has been lost or endangered.

(vii) When the house is overcrowded to such an extent as to amount to an offence under the Housing Acts.

(viii) When the house is reasonably required by the landlord as a residence for some whole-time employee of his or of some tenant of his. It must further be shown, however, that either (a) the tenant now in possession was in the employment of the landlord or of a former landlord and the house was let to him in consequence of his employment which has now ceased, or (b) the county agricultural committee or the Minister of Agriculture has certified that the person for whose occupation the landlord requires the house is or is to be employed on agricultural work.

Family Grounds

(i) Where the house is reasonably required by the landlord as a residence for himself, his son or daughter over 18, or his father or mother. This does not apply, however, where the landlord has become landlord by purchasing the house after September 1, 1939, in the case of new control houses or September 6, 1937, in the case of old control houses. Further there is a very important provision that even if the above conditions are complied with the court will not order the tenant to give up possession if it is satisfied that to do so would cause greater hardship to the tenant than the refusal of the order would cause to the landlord.

(ii) Where the tenant has sublet part of the house and is charging an excessive rent.

When a landlord does succeed in recovering possession of a house he is of course free to sell it or live in it himself but it remains controlled by the acts and if he lets it to another tenant the tenant is protected by the acts as regards both the landlord's claim to recover possession and any increase in the rent.

Restrictions on Rent. It is in the matter of the restrictions on rent that there is the

greatest differences between new control and old control houses. For each there is a standard rent which, apart from certain permitted increases, is the maximum rent that may be charged for the house to any tenant so long as the Rent Acts continue to apply to the house. This is the rent at which the house was let on August 3, 1914 (old control houses) or September 1, 1939 (new control houses) or if it was not let on those dates the rent at which it was last let before these dates. If the house was never let before these dates, the standard rent is the rent at which they were first let after these dates.

During and immediately after the 1939-45 War many houses were let which had never been let before and in some cases the landlords were able to obtain very high rents because of the housing shortage. This rent was the standard rent. In 1949, however, the Landlord and Tenant (Rent Control) Act gave the Rent Tribunals (see below) power to fix a lower rent as the standard rent in such cases if they thought it reasonable to do so. Permitted rent increases are:—

(i) A percentage on the amount spent by the landlord on the improvement or structural alteration of the house after August 4, 1914, or on additional or improved fixtures or fittings after July 18, 1933, in the case of old control houses. In the case of new control houses the date is September 2, 1939, for both these purposes. In no circumstances is expenditure on decorations or repairs counted for this purpose. The percentage which the landlord may charge is 6 per cent. per annum on expenditure before July 2, 1920, and 8 per cent. on expenditure after that date. A tenant in certain cases may object to the increase on the ground that the improvement was unnecessary.

Increase in Rates

(ii) In cases where the landlord pays the rates, he may add to the rent the amount by which the rates have increased since August 3, 1914, in the case of old control houses and since September 1, 1939, in the case of new control houses. The increase in rent may be made whether the increase in the amount payable as rates is due to an increase in the rateable value of the premises or to an increase in the rate itself. Rates include water rents as charges.

In the case of the old control houses two further increases are permitted:—

(iii) Forty per cent. of the net rent where the landlord is responsible for all repairs, the percentage being reduced where he is only partly responsible for repairs and being 15 per cent. when he is not responsible for any repairs. When the tenant pays the rates, the net rent is the same as the standard rent, when the landlord pays the rates, the net rent is the standard rent less the amount of the rates.

(iv) Where part of a house, e.g. a room, is sublet the tenant can charge the sub-tenant an additional 10 per cent. of the net rent and the tenant's landlord may claim half of this 10 per cent. from the tenant.

Neither of these increases (iii) or (iv) applies to new control houses but the tenant of either a new control house or old control house who sublets part of it as a separate dwelling must inform the landlord within 14 days.

A landlord who proposes to increase the rent of a tenant must bear two points in mind. First, he cannot increase the rent of a tenant whose tenancy has not expired, e.g. is a tenancy for a fixed period of time. Secondly, he must serve a notice of increase in a special form. The increase does not operate until four clear weeks (rates one clear week) after the serving of the notice. Any rent paid by the tenant beyond the amount permitted may be recovered within two years either by his deducting it from his current rent or reclaiming

it from the landlord. Premiums are illegal and may be recovered.

It will be seen from the above that only parts of a house let 'as a separate dwelling' are within the acts. This led the courts to hold that where part of a house is let but the tenant shares some living room, e.g. a kitchen—with the landlord or some other tenant, the letting is not protected by the acts. A tenant who has exclusive possession of some room but also shares a living room with his landlord is now given some protection under the Landlord and Tenant (Rent Control) Act, 1949 (see below) but one who shares a living room with another tenant is not protected.

A sub-tenant is protected against the tenant just as the tenant is protected against the landlord. A tenant can compel the landlord to state the standard rent. The landlord must supply a rent book in weekly tenancies.

Furnished Houses. As has been seen above these houses are not protected by the Rent Restriction Acts. After the 1939-45 war it became clear that some control must be imposed to protect tenants of such houses against excessive rents. The Furnished Houses (Rent Control) Act, 1946, introduced a system of control which is operated not by the ordinary courts, but by special local tribunals, called Rent Tribunals, appointed by the Minister of Health. The Act was amended by the Landlord and Tenant (Rent Control) Act, 1949. These acts are in force only in districts to which they have been applied by the minister but they have by now been applied to very many districts.

The object of these acts is to restrict rents. Only incidentally and to a limited extent do they prevent a landlord from evicting a tenant. The acts apply whenever one person allows another to live in a house or part of a house on payment of a rent which includes payment for the use of furniture or for services such as attendance, heating or lighting, or the supply of hot water, but the acts do not apply where board is supplied if the value of the board is a substantial proportion of the whole rent. The acts apply whatever the rateable value of the house and whenever the letting took place.

Rent Tribunal Procedure

The following is the procedure. The tenancy may be referred to the Rent Tribunal by either the landlord, the tenant, or the local authority and the tribunal then considers whether the rent is reasonable. It may approve the rent or reduce it, or may dismiss the reference. In the special case where the rent includes payment for services the tribunal may increase the rent where they think the increase since September 1, 1939, in the cost of providing the services makes it reasonable to do so. The landlord cannot, however, charge the increased rent until the tenancy has been ended and will be prevented from doing so even then if, as may be the case, the house comes within the Rent Restriction Acts (see above) as it may do if it is let unfurnished.

The rent fixed by the tribunal is registered by the local authority and it is illegal to charge a rent in excess of the registered rent or to charge a premium. This latter applies whether the premium is charged by the landlord or by a previous tenant who demands it for vacating the house. An excessive price for furniture or fittings is treated as a premium. Any rent charged in excess of that registered may be recovered. The tenancy may at a later time be referred back to the tribunal for the rent to be reconsidered in the light of changed circumstances.

If a landlord could at once evict a tenant who referred the term of his tenancy to the Rent Tribunal the acts would lose much of their effectiveness. It is accordingly provided that once the terms of the tenancy have

been referred to the tribunal any notice to quit, served by the landlord after that time, is in general to be of no effect until three months after the tribunal has given its decision. This period may in certain circumstances be extended but the tribunal cannot give a tenant protection against eviction indefinitely.

Arrears and the Rent Acts. A landlord can not levy a distress for rent in the case of a dwelling-house within the Rent Restriction Acts without previously obtaining the leave of the county court.

Whether a house is within the Rent Restriction Acts or not, an under-tenant or lodger may obtain protection for his property against any distress levied by the superior landlord for rent due by his tenant (i.e. the immediate landlord of the sub-tenant). He should serve on the superior landlord or his agent a declaration in writing made and signed by him stating that the landlord's immediate tenant has no right of property or interest in the goods sought to be distrained, and that the same are the property of the under-tenant. An inventory of the goods referred to must be annexed to the declaration.

Tenants and Sub-Tenants

The declaration must also set forth the amount of rent (if any) due from the sub-tenant to the tenant, the times at which future instalments become due, and their amount, and must contain an undertaking to pay direct to the superior landlord instead of to the tenant any rent due or to become due until the arrears for which the distress has been levied have been paid off. A landlord, when the rent due by his tenant is in arrear, may serve upon any sub-tenant of that tenant a notice requiring him to pay all future rent to the landlord instead of to the tenant until the arrears have been paid off. When a sub-tenant receives such a notice he must pay his rent to the landlord.

Deductions from Rent. Rent is invariably a net amount and not subject to any discount or other reduction, such as is customary in trade. It is only in very exceptional circumstances that a tenant is entitled to make a deduction when paying his landlord. An example of this is where the tenant has been called upon in an emergency to pay the ground rent and has done so in order to protect his own interests and to avoid trouble, or perhaps simply for the convenience of the landlord, or in his absence. In such a case the tenant is entitled to deduct the amount from his next payment of rent. In the same way, when a lodger's goods are included in a distress for rent due by his landlord to the owner of the property, he can deduct their value, if they should be sold, from the amount of rent.

Quarter Days. For the larger houses rent is usually payable in England on one of the four statutory quarter days, namely Lady Day, March 25; Midsummer Day, June 24; Michaelmas Day, Sept. 29; and Christmas Day, Dec. 25. In some tenancies, where no quarterly payments are expressly stipulated for, the rent is payable at the end of each year, but in the great majority of leases and yearly tenancies rent is payable on the quarter days.

The Law in Scotland. In Scotland rent is paid half-yearly as a rule on one or other of the two term days, which are Whitsunday, May 15, and Martinmas, Nov. 11. These are called the legal terms to distinguish them from the other dates in the Scottish legal calendar, Candlemas, Feb. 2, and Lammas, Aug. 1, which are conventional terms. Rent may be paid on either of these latter terms if there is an agreement to that effect, but so far as the ordinary business of house letting is concerned the term days observed throughout Scotland are Whitsunday and Martinmas.

A peculiarity of the Scottish system is that a tenant may enter on May 15 or Nov. 11, but in all the burghs he moves out at the end of his tenancy on different dates. The moving out dates are fixed a fortnight later than the term days, namely May 28 and Nov. 28.

The equivalent of the written or printed form of agreement by which many English tenancies are governed is a document known as a missive, in which is set out the duration of the tenancy, the amount of the rent and when it is payable, the rates for which the tenant is responsible, and whatever conditions have been agreed upon as to repairs. No tenancy is effective until the missive has been signed by the tenant.

House Letting in Scotland

The business connected with the letting of houses is carried on as in England by house agents or factors, but a considerable portion of it is in the hands of lawyers. This applies especially to property let on weekly or monthly tenancies, but it also includes larger houses and flats which are let by the year or leased for longer periods. The law agents undertake the advertising and letting of the property, collect the rents, and see that the conditions set out in the missive are duly observed.

Notice to terminate a letting of a house must be given in writing forty days before Whitsun (May 15) or Martinmas (Nov. 11) if the letting is for over a year. If the letting is for four months or less the notice must be given some time not less than a third of the total let before the end, and if over four months then forty days before the end. All these periods may be altered by agreement between the parties concerned.

Special provisions apply to small houses entered in the valuation roll at a small amount. The maximum figure varies according to the size of the burgh in which the house is situated. No agreement for any letting of such a house is valid if made more than two months before the let is to begin; let's for more than a month can only be ended on the 28th of a month at noon, and those for less than a month on a Monday at noon; a 4 days' notice must be given if the let is for 3 months or more, and a notice equal to a third of the let if the let is for less than three months. None of these conditions can be altered by agreement. If a tenant of such a house is seven days in arrear with his rent, the landlord may give him 48 hours' notice.

The Rent Restriction Acts apply to Scotland, but the English acts relating to furnished houses do not, although similar protection is given to tenants of furnished houses by the Rent of Furnished Houses Control (Scotland) Act, 1943.

An important point in favour of tenants, and one which is not generally appreciated, is that when a tenant of a controlled house or flat dies, his rent protection continues for his widow residing with him at death or any member of his family residing with him at death.

REPAIRS: To Houses. When a house is let for a term of years the agreement usually contains a clause stating whether the landlord undertakes all reasonable and necessary repairs, or whether the liability rests on the tenant. In the absence of such a clause there is no liability on either side so far as the agreement is concerned, but there may be a statutory liability. In Scotland, on the contrary, the landlord is liable for repairs, and if he fails to carry them out the tenant may do so and deduct the cost from the rent.

Sometimes there is a covenant in a lease under which the premises are to be delivered up in a good state of repair on the expiry of the lease. The tenant should understand that in such a case he is liable to put the house in proper repair whatever may have been its condition when he entered it. In this and all

other cases everything depends on the terms of the agreement, and before he puts his signature to that document a tenant should always take the trouble to ascertain exactly what his position is in regard to repairs. Thus the tenant is liable to the landlord for any disrepair if under an express agreement to yield up the premises in good repair.

The usual covenant in an ordinary tenancy other than by lease is that the tenant must keep the premises in a proper state of repair, fair wear and tear excepted, and leave them in such a state at the end of the tenancy, and that the landlord shall have the right to enter the premises at any time or within reason to see that they are in a proper state of repair. The landlord is under no liability to do repairs unless he has expressly agreed to do so, or there is a statutory duty imposed on him. Where liable, and he refuses, the tenant can do them and sue the landlord for the cost. The tenant cannot deduct such cost from the rent.

The tenant is bound to take ordinary care of the premises and to make good any damage done during his tenancy. He is not bound to replace windows or door panels that were broken before he entered into possession, but if these or any other fittings should get broken afterwards he is liable for the repair.

A roof which leaks after a tenant has taken over is often a matter of dispute. Apart from agreement or statute the landlord is not liable. It has been held in the courts that it is the tenant's duty to see to its repair, but this is a doubtful proposition. In most cases a landlord, in his own interest, will repair it so as to preserve his property; but he would be quite within his rights in refusing to do so, and then the tenant in his own interest would probably do it.

Repairs and the Rent Acts

Under the Rent Acts the subject of repairs acquired increased importance. Where the landlord is responsible, increase of rent is conditional upon a house being kept in proper repair, and he is deemed to be responsible for all necessary repairs for which the tenant is not expressly liable. A certificate from the sanitary authority that a house is not in a reasonable state of repair is a good defence to any claim for increased rent.

A landlord is liable to his superior landlord or freeholder for repairs if the property is leasehold, and those who own their own house should carefully study the covenants of their lease. The ground landlord can compel him periodically to repaint the brickwork, etc. The landlord who is his own freeholder is liable to the local authority if his property becomes dilapidated.

Low-rented houses stand on a different footing. The landlord here is deemed to warrant that the house is in a habitable state when the tenancy begins and to contract that it shall be kept in reasonable repair during the tenancy. Such houses are those the rent of which does not exceed £40 a year in London, £26 elsewhere. In no case does the implied warranty hold when the letting is for three years and upwards, not determinable before that time by either party, and when the lessee has agreed to put the house into habitable condition.

A tenant who has agreed to repair and keep in repair his house is not bound to make a new house of it. Unless he has expressly agreed to paint he need only paint so far as is necessary to preserve wood or ironwork, and not for decoration. Regard must be had to the kind of house, its age, situation, and the like. Thus a tenant of a house in Grosvenor Square, London, undertaking to keep it in repair, must conform to a much higher standard than a tenant in Mile End Road.

If the tenant fails to repair, when bound to do so, he will be liable in damages, but

damages must not exceed the actual loss suffered by the landlord. When a house is shortly to be pulled down or structurally altered, no damages can be recovered for failure to repair it.

A tenant should take care to see that the house is in good order before he enters it, for there is no implication of law, except as to low rental houses, that an unfurnished house is habitable, so if the new tenant finds the drains are unsound, he has no remedy. Under a lease for 21 years, where the rateable value does not exceed £100, a landlord cannot, without the leave of the court, enforce a covenant to repair five years or more before the lease expires. See *Dilapidations, Drains, Rent*.

REPOTTING. As plants raised from seeds or cuttings increase in size it becomes necessary to repot them, i.e. to place them in larger pots of soil to provide the roots with the extra nourishment needed. The first repotting of the seedlings or rooted cuttings is in small flower pots, 2½ in. wide; the next shift is to 5 in. pots, which are large enough for many kinds of flowering plants: 6, 7 or even

8 in. flower pots are required to ensure the full development of certain kinds, e.g. chrysanthemum, cineraria, herbaceous calceolarias.

Before disturbance for repotting, a plant must receive a thorough soaking some few hours in advance. To turn a plant out of its pot hold the stem between the fingers and invert the whole: then give the edge of the pot a sharp rap on the edge of a bench, and lift it clear of roots and soil. With a stick pick out the old drainage crocks and remove loose soil.

The new pot must be scrupulously clean, and it is worth while ensuring this condition by scrubbing it out with hot water. Clean crocks are desirable also. Suitable composts vary with different classes of plants. For palms and aspidistras, 2 parts loam and half portions of leaf-mould, peat, and sand will be found excellent. The same materials in equal portions will satisfy ferns, whilst 2 parts good fibrous loam, 1 part well-decayed manure, and a little well-washed silver sand will suit such plants as fuchsias and geraniums. See *Fern Potting*.

REPOUSSE WORK IN BRASS AND COPPER

Particulars of a Process that Gives Charming Results

This contribution should be read in conjunction with the article on Bowl, where the elements of simple repousse work are explained. See also *Metal Work, Napkin Ring, Piercing, Silver Work*.

In its strict application, repousse work means the formation in relief in thin metal of a pattern beaten up from the reverse side, but it now generally includes the shaping as well as the decoration of the article. It is a handicraft that can easily be done in the home, a workshop not being essential for its processes. Brass and copper are commonly employed, the most useful thicknesses of metal being from 26 to 22 imperial standard wire gauge.

In selecting the metal its ductility is of importance. Silver, although expensive, will bear considerable expansion and is pleasant to work on. Of the inexpensive metals copper is extremely ductile; it can be finished with an agreeable surface and is not liable to crack. Brass is harder, and not so suitable for high relief, but for many small articles it is very useful. Pewter is extremely soft and easily worked, but it is liable to split, and only in the thinnest sheets can it be used for high relief with any success. Iron and steel, particularly if thin, are capable of considerable expansion, but the repousse ornament should be restrained.

Repousse work may be begun with a few tools, the principal ones being shown in Fig. 1. The first is the hammer, the head of which should be steel, or at least steel faced; the handle of special form is about 10 in. long, quite slender for two-thirds of its length, and terminating in a knob of a flattened oval form. A boxwood mallet with a similar handle is also necessary.

A selection of small punches is required; these for a beginning should comprise a tracer, a number of raising tools, pearls, punches, and matting tools. A steel scribing point is necessary, but it can be made from a knitting-needle; a pair of shears, compasses, try-square, and steel rule complete the worker's equipment.

Although a number of small articles can be made without it, a pitch block is essential for good work. This is a block of wood covered with a thick layer of cement made by melting 4 lb. of best black pitch in an iron pot and stirring in ½ lb. powdered resin and ¼ lb. Russian tallow. When thoroughly mixed, add 4 to 5 lb. of plaster of Paris.

Another cement is made by substituting powdered bath brick for the plaster. These mixtures are highly inflammable, and if overheated a vapour may be given off which will easily take fire. Wherever possible the melting should be done out of doors. A wood fire can be used and the vessel supported on a couple of bricks. For small work it is convenient to pour the cement into a tin bowl, but generally it is better to use a block of wood about 12 in. by 10 in. by 2 in., and form a border on top of this to a height of 4 in. with strips of stout cardboard, so that the molten cement will not run off the board.

The tallow renders the cement soft, and it is advisable to have two blocks, one with a little less tallow than the amount stated above, and another with a little more. The block should be rested on a pad of stout canvas or leather filled with silver sand. If made with leather the pad can be used for working high relief without any risk of perforating the cover.

Making an Ash Tray. Fig. 2 shows a simple piece of work made from a piece of sheet copper or brass of about 24 S.W.G. and 8 in. square. In the first place the metal must be flattened on a hard, flat and true surface, such as that of an old flat iron mounted on a wooden stand. Only the lightest possible blows are needed, otherwise the metal will become buckled.

The metal is cleaned with emery cloth and a little oil, circular scouring marks being made all over the surfaces. The oil is wiped

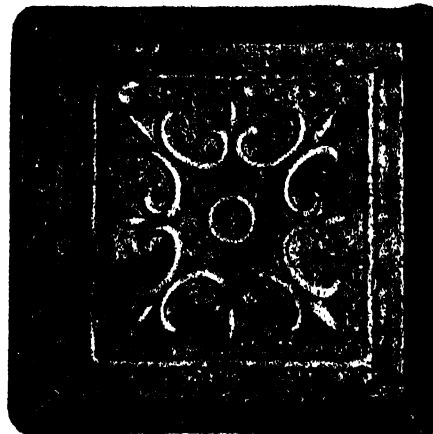


Fig. 2. Ash tray which can be made in brass or copper, suitable for the amateur's first attempt.

off, and the surface is ready for work. The design is now transferred with carbon paper on to the best surface, or, if preferred by the worker and he has some artistic ability, the pattern can be drawn direct on the metal. To prevent the lines getting rubbed off they are scratched over with a scribing point, which must be kept sharp for this purpose.

The next step is to indent the lines with the tracer, and probably some little difficulty will be experienced with this tool at first. It is necessary to make an even indentation which will show as an even line on the other side of the metal, and the best way is to mount the metal on the cement block. To do this the surface of the pitch must be melted, either by placing it in front of a fire, in an oven, under the grill of a gas stove, or by using a blow-lamp. It is not necessary to melt more than ½ in. down, and then the metal is pressed on the cement so that it is just below the level of the surrounding surface, and the cement pressed out is allowed to run over the edge sufficiently to hold it in place.

The tracer is held in the left hand with the thumb and first two fingers and with the edge on the line, but tilted slightly away from it. The third and little finger should be behind the tracer and resting on the metal. The hammer is poised directly over the tool, and then a series of light, even, and continuous taps are directed on to the tool. There should be no need to assist the tool forward, as the action of the hammer should have a propelling effect. The blows must be light, but the exact weight of the blow can only be gauged by experience. A fairly accurate estimate can be obtained by making a few tracer indentations on a piece of spare metal rested on a block of soft wood.

Raising the Design. When all the lines have been traced, the cement can be chipped off the edge of the metal, which is then prized

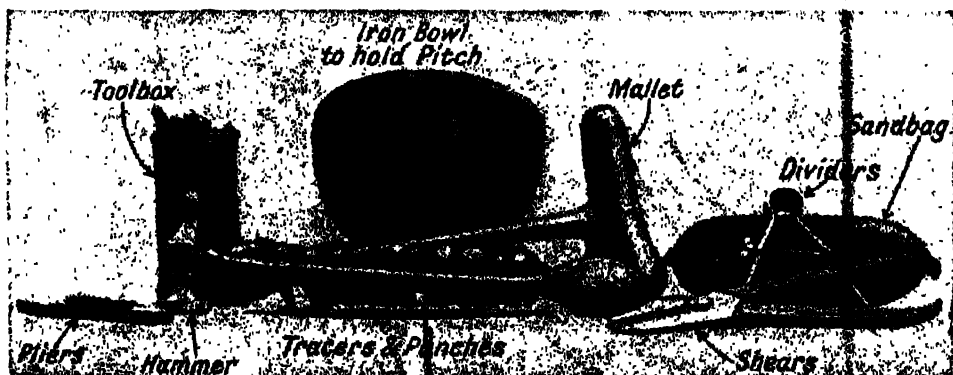


Fig. 1. Good outfit for the amateur, by means of which most of the work illustrated can be done. Courtesy of G. J. Plucknett & Co., Ltd.

off the block. If the metal is warmed and wiped with an oily rag, any adhering pitch can be removed. The pattern should be plainly visible on the other side of the metal and that side is now placed uppermost and fixed in the cement. A brass punch is placed between the raised marks and the hammer used to drive it into the metal.

It is better to work along gradually, making a slight hollow, and to repeat the process several times, rather than attempt to reach the required depth at one blow. It will be seen that much depends on the shape of the punch. If some hard brass rod and bar is obtained, it will be possible to form suitable shapes with a file. The shaped end of the punch must be quite smooth and polished, as any uneven marks will show on the other side of the punched surface. Having sufficiently deepened the pattern, the metal is removed from the cement, warmed, cleaned, and then replaced with the raised surface uppermost.

The shape of the pattern is now adjusted with the tracer, but this time it is placed on its side, so that hammer blows properly directed will work the raised pattern to its correct shape. This is a simple operation, but care must be taken that only the lightest hammer blows are given, otherwise there is risk of driving the tool through the metal. If the metal has become uneven during the previous work, it can be levelled with the mallet, removing it from the cement and placing it on the sandbag, and when necessary on the flat iron, taking care not to damage the raised surface.

Ornamentation of the Ground. If it is desired to punch or indent the surface of the ground, or give a matt effect, the metal must first be thoroughly cleaned. Useful tools are the pencils, made of round steel rod ground to a round point and polished; these are usually provided in 3 or 4 sizes. By obtaining a number of 5 in. lengths of $\frac{3}{8}$ in. steel rod, it will be possible to make suitable pencils, and also a tracer, which requires grinding to a blunt edge on both sides. Steel punches are made in the same way, by using rod of suitable thickness and grinding the ends to the required shape. All steel punches must be hardened and tempered, and the ends of them must be highly polished.

The methods described are suitable for all raised work, but with high relief it is necessary to remove the metal frequently for the purpose of annealing. Continual hammering, either direct or through a punch, has the sure effect of hardening the metal, and it is only when it is soft and ductile that the material can be thinned out. As a rule the harder the metal is the more frequently must it be annealed.

More Elaborate Work. When the repoussé worker has had experience in raising simple forms, and desires to attempt more elaborate work, it will be necessary to do some of the preliminary sinking on the sandbag. Owing to the skill required in the successful manipulation of the mallet and the prevention of undue straining of the material, it is not advisable to attempt this stage of the work until a fair knowledge of the properties of thin metal has been gained.

When the sandbag is used, the surface of the flat iron, or a suitable hard surface, should be used in conjunction with it; after every few blows with the mallet, held as at Fig. 3, the work must be straightened on the flat surface, and frequent annealing must not be forgotten. The deeper the sinking is carried the thinner the metal becomes.

The surface finishing of repoussé work is an important matter, and consideration of the purpose of the finished work enters largely into it. If it is desired to tool the raised surfaces to any extent, it will be necessary

to fill up the hollows before the metal is placed on the cement block. The surface modelling is done in the same way as ordinary raising, but using greater care. Punches suitable for working the particular shapes are used. The tracer, employed as described above, is a useful tool to define shapes.

Repoussé decoration of bowl shapes is not so simple as in flat work, and different methods must be employed. Figs. 4 to 7 illustrate some of the progressive stages in the process of decorating a small fruit dish. For a small bowl where it is impossible to use a punch, the method is to use a snarl held in the vice and a hammer. Several shapes of snarl must be provided, and it is hardly possible for the amateur to attempt much of this work without a large equipment. The raising is carried as far as possible with the snarl, and then the bowl is filled with cement, so that the main portion of the work can be done from the front. Professional workers rely almost entirely on surface modelling to obtain the effect, and are content to bulge the decorated surface beforehand.

The selection of suitable designs is not difficult; many are to be found in the pages

of this Encyclopedia. It is important that the shaping should be done as far as practicable before the ornament is worked. It is often possible to do the shaping and the decoration at the same time, but it is only with a few shapes that it is possible to shape the work after raising a portion of it. Simple forms for trays and dishes can be done on the sandbag, and with the aid of one or two metal worker's stakes of varying shape (see Silver Work) all but the most elaborate forms can be worked.

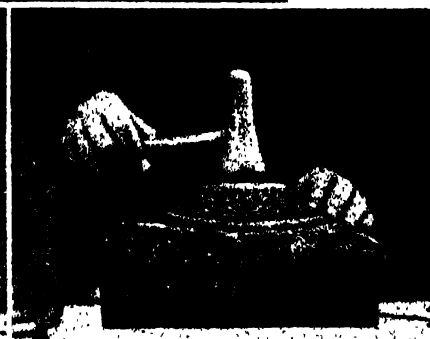
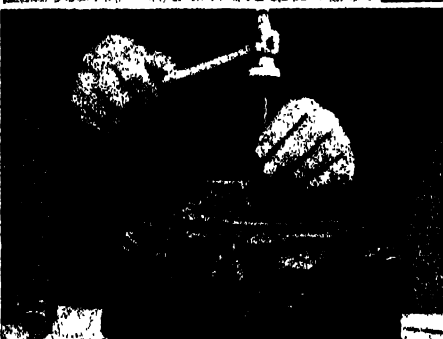
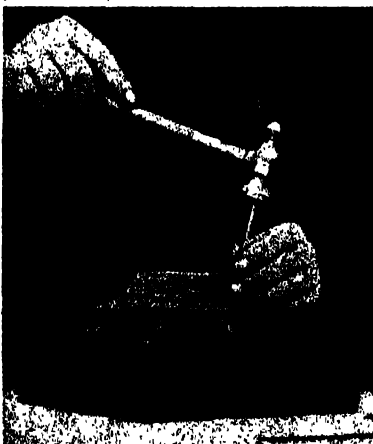
The method of procedure in advanced work is very little different from ordinary raising, the main consideration being that of modelling. It is not always easy to gauge correctly the amount of sinking necessary to produce a pleasing surface effect; only experience enables the worker to obtain the approximate depth so that removal from the block can be reduced to a minimum.

With large bowls it is always advisable to complete the shape as far as possible before the decoration is applied, and also to use the sandbag and mallet to beat out prominent portions of the design. This method assists the raising, because the metal is spread more evenly than is possible on a large surface when only raising tools are employed.

Final surface finishing should not be attempted unless the hollows have been filled completely with pitch; if there is much work to do, it is advisable to use a harder pitch than is generally employed. Matting tools should be used always with discretion, and in large work must be avoided for purposes of background effect. The main object in employing them should be to give texture to leaves and drapery.

Cleaning and

Finishing. The metal when worked is warmed and cleaned and then dipped into an acid bath; it is washed and dried and then polished with a hard brush and powdered pumice. If a highly polished surface is desired the prominent portions



Repoussé Work. Showing how the various tools are held and used for the successful execution of this decorative metal work. Fig. 2. Inclination of the mallet when beating out a hollow in a flat piece of metal. Fig. 4. Method of holding the tracer. Fig. 5. Tracer held on its side to true-up shapes in the design. Fig. 6. How to hold the punch. Fig. 7. Method of holding the mallet for setting metal

should be burnished and finally coated with lacquer, but it is usual for a plain surface to be left and then lacquered. A common finish for copper is oxidation, this is effected by dipping the metal in a solution of ammonium sulphide and thoroughly washing when the desired colour is reached. Owing to the offensive odour of this liquid, the work should be done out of doors. To retain even the oxidized surface it should be lacquered.

REPP. The name rep or repp of this furthest and dress fabric comes from the fact that the surface is ribbed.

The best furniture repps are made with threads of two different thicknesses running in both directions of the cloth. The structure is firm, and in good colours repp is a suitable material for covering chairs, sofas, etc. See Upholstery.

RESEDA. This is the botanical name of night-madder, a beautiful plant with sweet-smelling flowers. It is sown out of doors in April for summer bloom, and in pots in August to produce winter flowers under glass. Reseda glauca, a hardy perennial with grey-green leaves and pale flowers in summer, is a useful border plant.

RESIN. The best-known resin, or rosin, is obtained by the distillation of crude turpentine, which exudes from pine-trees. It varies in colour from a pale amber to dark

cascade. The practical unit of resistance is the ohm (q.v.).

Resistance Coupling. In a wireless receiver this is a method of coupling the valves of a low-frequency magnifier in cascade by means of resistances.

A resistance is connected in series with the anode of the valve and the signal voltages across the resistance are applied to the grid of the following valve by way of a coupling condenser. The coupling condenser acts simply as a means of preventing the high tension voltage from reaching the grid of the valve. It offers a free path to the amplified signal voltages. A grid resistance or leak is joined between the grid of the valve and grid bias negative to allow the negative charge on the grid to leak away and to maintain the grid at a steady negative potential.

The amplification per stage in a resistance-capacity coupled amplifier can never exceed that of the valve itself, and this figure is reached when the value of the anode resistance becomes infinity. In practice it is possible to obtain a magnification of about two thirds the amplification factor of the valve. The use of a high value anode resistance in an endeavour to achieve the maximum amplification results in a loss of the upper musical frequencies and reduces the general brilliancy of tone.

In general, the value of the anode resistance should not be greater than 250,000 ohms. When faithful reproduction is desired, the values of the anode resistances may be 100,000 ohms or even lower. The use of too high a value anode resistance in the anode circuit of a detector valve may produce a complete lack of reaction. The coupling condenser should be sufficiently large to pass the lower musical frequencies, and 0.01 mfd. is a common value. It is essential for the condenser to possess high insulation.

A properly designed resistance capacity coupled low frequency magnifier will give very faithful reproduction, but the magnification per valve stage is considerably less than that obtainable with transformer coupling.

Another form of resistance consists of a coil of wire from which tapings are taken and led to an arm passing over a series of studs which divide the coil into sections. The resistance is placed between the power circuit and a piece of electrical equipment, such as an iron, to control the amount of current flowing to such equipment. The line supplying current is connected to the base of the pointer, and when the tip of the pointer is placed on one of the studs the flow of current has to pass through that portion of the coil in circuit. In an electric iron, adjusting the pointer across the studs increases or decreases the amount of current reaching the heating element and, therefore, the heat of the iron. The fewer sections of coil placed in circuit by the pointer, the greater the heat of the iron. See Dielectric; Electricity; Electric Motor; Grid; Irons and Ironing; Wireless.

Respiration. See Breathing.

REST HARROW. This is the common name of a group of hardy perennials or shrubs (ononis) which bear pea-shaped flowers in summer. One of the best, suitable for the rock garden, is *Ononis aragonensis*, 18 in. high, with yellow flowers. *Ononis fruticosa* bears rose pink blooms. They should be planted in light or well-drained soil, and in a sunny position. Seeds sown in summer or

cuttings taken at the same time provide an increased stock. The common rest harrow which grows wild in Britain is *Ononis spinosa*, a low-growing somewhat shrubby perennial with rose-pink blooms.

RESTRAINER: Use in Photography. Chemicals used to prevent too vigorous a developing action on a negative or development paper are known as restrainers. Potassium or ammonium bromide is most commonly employed. They tend to delay density in negatives or bromide and gaslight papers while detail is formed. Potassium bromide is best kept as a 10 p.c. solution, i.e. containing 1 gr. of bromide in 10 min. of solution. Dissolve $\frac{1}{2}$ oz. potassium bromide in $4\frac{1}{2}$ oz. of distilled water and add about 5 min. of the solution to each ounce of developer.

RESURRECTION PLANT. This is a most curious plant, known also as the Rose of Jericho; its botanical name is *anastatica*. If placed in water it has the extraordinary power of reviving even after it has been kept dry for many months, hence its popular name. Seedlings may be raised under glass in spring and planted out of doors in summer. After the leaves fall the plants become somewhat woody and remain dormant until put in water.

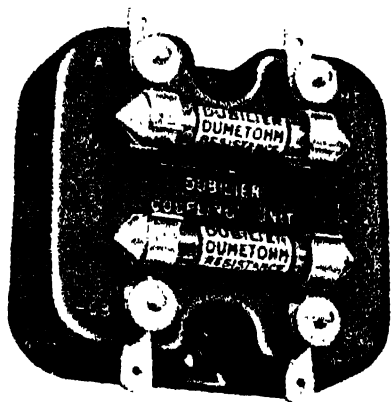
RETAINING WALL. Where the special function of a wall is to resist strain imposed upon a structure by adjacent earthwork it is known as a retaining wall. A common application of it is found in basement houses where a low wall is provided to keep the earth in position around the area. See Wall.

RETCHING. An involuntary and unsuccessful effort to vomit is called retching; gas is sometimes expelled. When it exists it is often a useful thing to drink large draughts of warm water, or very hot water may be sipped. See Sickness; Vomiting.

RETINOSPORA. This is a group of hardy evergreen conifers which is now merged in the genus *cupressus* or *cypress*. In gardens, however, the name *retinospora* still persists. One of the most beautiful is *Retinospora pisifera*, of which there are many varieties; *argentea* and *squarrosa* are handsome grey-leaved kinds while *plumosa aurea* has yellow or golden leaves. Another species is *Retinospora obtusa*, of which attractive varieties are *aurea* and *gracilis aurea*. Planting should be done in September or early October or in April-May in loamy soil. Propagation is by cuttings in a frame in September. See Cypress.

Retouching. See Spotting.

RETRIEVER. Of the four varieties of retrievers the curly-coated are so few in number that they are seldom seen except at shows. The handsome flat-coated dog has small dark



Resistance. Showing a complete resistance-coupling unit as described in the text.

brown, according to its purity or method of manufacture. It is a brittle solid with a glass-like fracture.

The solid resin is used for giving violin bows a grip on the strings, and in powder form is employed by golfers and tennis players to increase the grip of the hands. Dissolved in turpentine or benzene a ample form of varnish is obtained, but the surface of the varnish is not sufficiently hard unless copal or mastic resins are also used with it.

Resin is used in soap making, and resin soap is supplied in the form of a coarse powder for household cleaning purposes, but owing to its colour it is not suitable for washing linen.

RESISTANCE. This is the opposition offered by an electric circuit to the flow of electric current. The resistance of a wire is directly proportional to its length and inversely proportional to its cross sectional area.

Copper and silver have a low resistance per unit length, whereas certain alloys, e.g., manganese, nichrome, etc., have a high resistance per unit length.

Resistances are frequently employed in wireless receivers to prevent the passage of high frequency currents, to reduce voltages, and in certain methods of coupling valves in



Retriever. Prize-winner of the sturdy short-coated Labrador variety.

eyes which give him a kindly appearance, and he is as intelligent as he looks. The shoulders are so well placed as to give freedom of action. The body is shortish, of medium length in couplings, thus enabling him to gallop. The front legs are perfectly straight.

The Labrador is another variety. Here the coat is peculiar, being short, very thick and somewhat like fur to the touch. There is scarcely any feathering on legs or thighs. Altogether he is squarely, sturdily built. The eye, which should be a dark hazel, is sometimes still too light. The retriever is a first-class dog for work, and very frequently proves the winner at field trials. The golden retriever is of Russian extraction.

Training. A retriever puppy may be broken in very early, the first step being to gain his confidence. Encouraged by the reward of a biscuit he should be taught to come at a gallop in response to a low whistle. To teach him to drop, take him into a quiet spot, secure his attention, and hold up one hand, pressing him into a recumbent position with the other. The command drop should be repeated every time. He should remain in this position even when his master walks away; but if he refuses, he may be fastened to a peg until he does so. At six months old he may start learning to retrieve. He is first taught to fetch some soft object, such as a rolled-up handkerchief, which his master throws a few yards in his sight, with the order "go fetch." The distance is extended gradually, until the object is dropped when he is not looking and he is ordered "lie seek." See Dog; Kennel; Mange, etc.

REVERSI. This indoor game is played with 64 counters on a board resembling a chess board, but usually somewhat smaller

In brief, these regulations decree that no person may possess any firearm or ammunition unless he holds a certificate to do so, such certificate being granted by the chief police officer of the district in which he resides. To secure a certificate of this kind the applicant must satisfy the police that he has good reason for needing the revolver or other firearm, and that its possession is not likely to cause any danger to the public safety or any breach of the peace.

For these reasons a certificate will not be granted to anyone who is of intemperate habits, or is in any other way considered unfitted to possess a firearm. The cost of a certificate is 5s. It lasts for three years and may then be renewed for a further three years (see 2s 6d.). The law provides also that any dealer who sells a revolver or other firearm must take the name and address of the person to whom it is sold. These facts must be communicated to the police, and also put on record. A certificate is not required for a smooth bore shot gun at least twenty inches in length.

Revolvers are distinguished by the size or calibre of the bore, the usual sizes being .22, .32, .38, and .455. The smallest size, i.e. .22, is of little value except as a target weapon. The .38 is the smallest calibre that can be relied upon to stop an assailant, but the defensive uses of the others are by no means negligible. Cartridges are sold according to the calibre. See Gun.

RHAMNUS. Several hardy shrubs of no great decorative value are included in this genus. The British buckthorn (*Rhamnus cathartica*), a leaf losing shrub, 12-15 ft. high, bears black berries in autumn. The wood of *Rhamnus frangula*, another British shrub or small tree, makes excellent charcoal. *Rhamnus alaternus*, an evergreen, and its varieties with variegated leaves, are useful for shrubberies; they reach a height of 8-10 ft. The bark of one species of *Rhamnus* supplies the medicinal preparation cascara sagrada. Propagation is by cuttings in a frame in late summer.

RHEUMATIC FEVER.

The disease called rheumatic fever, or acute rheumatism, has been known as a scourge of childhood for more

than two thousand years, but the exact causation, whether it be a germ or virus or other cause, is still disputed. It is considered probable that in some cases infection enters by way of the tonsils. The chief danger in rheumatic fever or acute rheumatism is that the heart may become affected. There is fever, profuse sweating, inflammation and great pain in the joints, the attack lasting from 2 to 6 weeks, or longer, and the sufferer is liable to be attacked again. The younger the patient the greater is the liability to heart injury. In children the pains may be slight, and may be described as growing pains. There may be very little fever, but anaemia may develop, and a frequent accompaniment is chorea, or St. Vitus's dance.

As soon as the disease is recognized the patient should go to bed, and should wear a flannel nightgown made to open all the way down; the sleeves should either be very loose or be slit from shoulder to wrist, and fasten with buttons. This is to facilitate the frequent bathing which is necessary because of the sweating. Four or five nightdresses should be prepared. Remove the sheets and let the patient lie between soft,

fine blankets, or provide flannel sheets. Absolute rest is essential, and there must be no visitors. The general treatment is that of fever (q.v.), but a thorough course of salicylates must be administered. When the patient is convalescent attention should be paid to the state of the throat and the question of removing diseased tonsils may have to be considered. The patient, especially if a child, should be seen by a doctor from time to time for some years after an attack of acute rheumatism.

RHEUMATISM. This term is applied very loosely to a number of diseases differing from one another fundamentally. They are all, however, characterized by pain and inflammation in the joints or muscles or tendons, etc. See Fibrositis; Lumbago.



Rheumatism Root. A sprig-flowering dwarf plant suitable for a shady rockery.

RHEUMATISM ROOT. This name has often been applied to a species of *Jeffersonia*, a hardy dwarf plant suitable for shady crevices in the rockery or as an edging for borders. It bears white flowers during spring, and is best planted in October in ordinary sandy garden soil. Propagation of the plant is by seed or by division of roots.

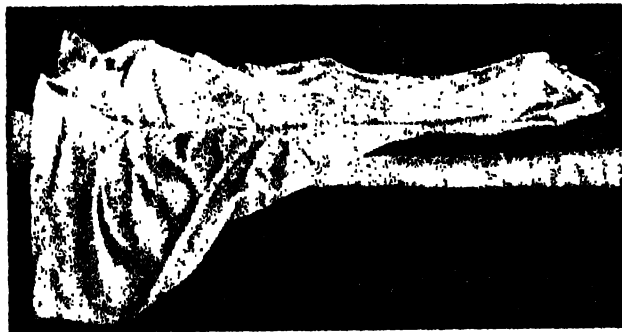
RHEUMATOID ARTHRITIS. The chronic joint disease known as rheumatoid arthritis is not a rheumatic affection, and must also be distinguished from osteo-arthritis in which bony changes are early and distinct. It is a chronic inflammation of the synovial membranes of joints and of the fibrous tissues which surround the joints.

As in other chronic arthritic diseases, pain, swelling, and stiffness are likely to be increased by cold and damp, or by unaccustomed or undue strain on the joints. The joints of the fingers just below the knuckles are generally those first affected, and usually in both hands; then the disease appears in the knees and feet, but it may involve nearly all the joints of the body.

The prime cause of rheumatoid arthritis is the activity of certain bacteria of low virulence. These form foci of infection, most commonly at the roots of the teeth or in the tonsils, but it may be at other situations in, or on, the body. The treatment of the disease should therefore begin with a search for some such focus and an attempt to clean it up, with, possibly, a course of vaccine treatment in addition.

During the acute stage the patient should be kept at rest, and, as the deformity is caused in the first place by spasm of muscles, the affected joints should be splinted in such a position as to prevent deformity. When, however, the acute stage has passed off, the joints are freely and fully moved by the doctor or someone under his direction.

Various methods, including fomentations, baths of various kinds, diathermy and electrical treatment, are used to diminish pain and swelling. Massage, whirlpool baths and electrical stimulation are also useful in preserving



Rheumatic Fever. A dangerously high temperature may be reduced by wrapping the patient in a sheet wrung out of ice-cold water. This should only be done under a doctor's supervision.

It can, however, be played on a chess or draughts board. The 64 counters are red on one side and green on the other. They are divided between the two players, one treating his as red and the other treating his as green. The players in turn place one on any vacant square on the board, each keeping his own colour uppermost.

The object of the game is to place the pieces so as to enclose one or more of the hostile pieces between two of his own. This done, the enclosed pieces, which must be in a straight line, join the other side, i.e. they are turned over and so changed from red to green or vice versa. The game continues until all the pieces have been played out, and the player who has the most of his colour on the board is the winner.

REVOLVER. A revolver may be described as a pistol with a revolving cylinder, in which are a number of cartridge chambers. Several shots can therefore be fired without reloading the weapon. With revolvers may be classed the weapons known as automatic pistols, which have a magazine. The law about owning and carrying revolvers is the same as it is for pistols and other firearms.

the tone of the muscles. The diet should be generous. Cod-liver oil is often a useful addition. Ultra-violet rays are often used in order to increase the general resistance to infection, and gumacol carbonate of sulphur may be given to disinfect the bowel.

RHODANTHE. This is a pretty half-hardy annual with pink or white everlasting flowers which last a long time when cut. It is chiefly suitable for cultivation in pots in the greenhouse, although seedlings may be planted out of doors for the summer. Seeds are sown under glass in March or out of doors in May. The chief kind is *Rhodanthe manglesii*. The correct name of this plant is *Helipterum manglesii*. Other *helipterums* supply the immortelle flowers which when dyed in various colours are used by florists in making wreaths and other floral devices.

RHODE ISLAND

RED. There are two varieties of this American breed of fowl, the single combed and the rose combed, and it is one of the best winter layers. The rich brown egg in some strains average 2½ oz., the general average being 7 or 8 to the lb. It carries a lot of flesh, which is of good colour and fine flavour.

The hens are most excellent mothers; the chicks are hardy and mature quickly. Adult males weigh 6 lb. to 8½ lb., and the females 5 lb. to 6½ lb. They do well on free range, also on the semi-sensitive system, but are not to be recommended for intensive or confined quarters, as they become very broody.

The colour should be deep, rich red and even throughout, the tail should be black, and the wings should show black in both primaries and secondaries when opened out. The two colours must be clear and distinct, what is known as a peppered wing is a bad fault in an exhibition bird. The neck hackle of the male should match the body colour, in the female it should be tipped with black. The comb, lobes, wattles and eyes should be red, the legs and feet rich yellow. See Fowl, Poultry.



Rhodian Ware. Sixteenth century Turkish jug having a blue background decorated with cream and red flower buds

by permission of the Director, Victoria and Albert Museum, S Kensington

RHODIAN WARE.

Some modern faience bowls and jugs which attempt to recapture the colour and design of medieval Rhodian pottery are brilliant and decorative, but it is hardly possible to mistake them for the genuine old ware. This was produced from the 14th to the 18th century in the island of Rhodes.

At first, owing to the fact that it was made by Persian exiles, it followed very closely the inspiration of Persian ceramics. It was fabricated of a sandy, artificially fused, and highly vitrified clay, covered with a hard, thick, glassy paste. The forms include shallow dishes, ewers, flower-holders, lamps, and domestic ware generally. The decorations comprise naturalistic flowers such as roses, tulips and carnations, besides birds, arabesques, and various other types of oriental designs.

Sometimes the designs consisted of ships and coats-of-arms, done for the Knights of St. John. There are also decorated tiles, based on the patterns of tapestry hangings. Very thick pigments, red, blue, or turquoise, outlined in black, and often on soft grounds, impart to the decorative scheme an opulent effect. The inscriptions are usually Persian.

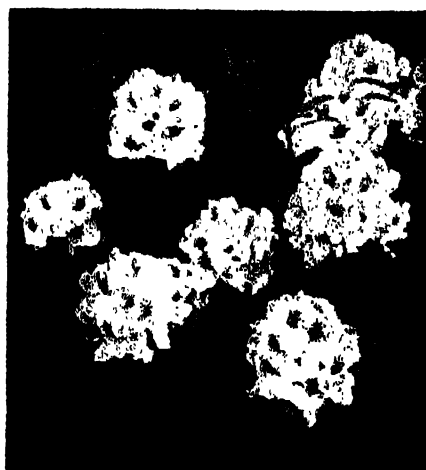
After the departure of the early craftsmen they were replaced by Latin potters, who derived their ceramic motives from European tapestries, and continued at work until the middle of the 16th century. After that Turkish workmen carried on the tradition, but the pottery gradually deteriorated, until by the 18th century good work was no longer made. See Pottery.

RHODODENDRON.

This is the finest evergreen flowering shrub suitable for cultivation out of doors in the British Isles. In recent years numerous new species have been introduced from Western China and other far Eastern districts, and many hybrids have been raised in gardens at home. A representative selection will provide blossom from early spring until June.

The leaf-losing azalea, which is regarded by gardeners as a distinct shrub, is now merged in the genus *rhododendron* by botanists. A few evergreen rhododendrons are beautiful shrubs for the heated greenhouse.

The rhododendrons of chief value to the amateur gardener are those hardy evergreen kinds which provide such a brilliant display of blossom in May and June. Almost all of them are hybrids or crossbreeds which have been raised in gardens and nurseries, and new varieties are introduced every year. These are some of the most attractive: *Bagshot Ruby*,



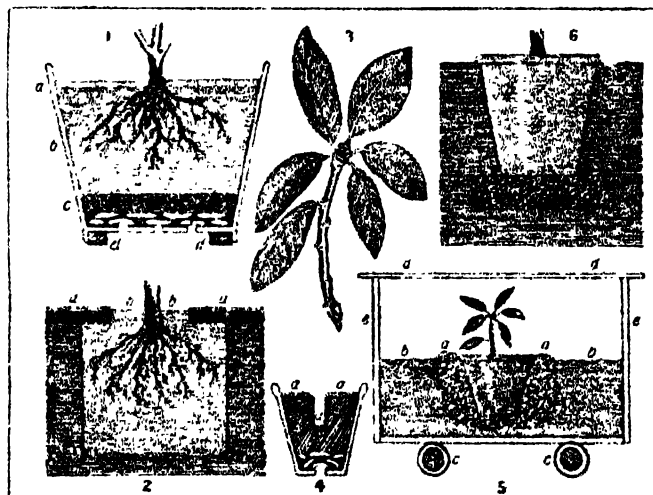
Rhododendron. Flower clusters of one of the numerous beautiful varieties

Broughtonii, rose-crimson; *Corona*, pink; *Cynthia*, rose-crimson; *Diphole Pink*; *Doncaster*, red; *Eversatium*, lilac-rose; *fastuosum* fl. pl., mauve; *Gomer Waterer*, bluish; *Loder's White*; *Michael Waterer*, bright red; *Pink Pearl*, rose pink; and *Sappho*, white with dark blotches. *Nobleanum* bears its red flowers in spring, sometimes in winter if the weather is mild. Other early flowering varieties are: *Ascot Brilliant*, red; *Handsworth White*; and *Rosa Mundi*, bluish.

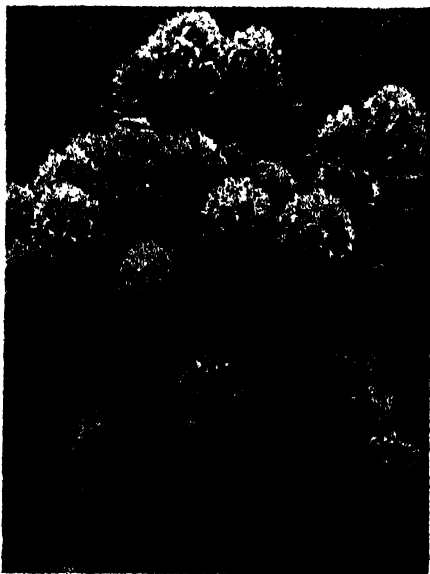
There are many beautiful rhododendrons among the species or wild types of other lands. Some of them are low growing and suitable for planting in the rock garden, e.g.: *dauricum*, rose-purple; *fastigiatum*, lavender blue; *hirsutum*, rose-red; *moupinense*, bluish; and *racemosum*, pale rose. *Angustifolius*, a taller shrub, bears beautiful lavender blue flowers in spring. The Swiss alpine rose is *Rhododendron ferrugineum*, a dwarf with rose-red blooms.

The Himalayan rhododendrons develop into immense bushes in sheltered gardens in mild parts of the country, but they are scarcely suitable for general planting—not because the shrubs are not hardy, but because they bloom early, and the flowers are liable to be spoiled by frost. Among them are: *camptocarpum*, yellow; *argenteum*, cream-white; *Falconeri*, with very large handsome leaves and pale flowers; and *grande*, white.

Hardy azaleas make a brilliant display in May and June. The colours of the flowers



Rhododendron. 1. Tub planting: a, sand; b, sandy peat; c, chopped turf; d, wood blocks. 2. Lawn planting: a, grass; b, sandy peat. 3. Cutting with heel. 4. Pot prepared for cutting: a, silver sand; b, cutting; c, moss; d, fibre; e, steam pipes; f, glass; g, box. 5. Old plant plunged in open border on base of cinders



Ruby-red clusters of flowers of the rhododendron named *Bagshot Ruby*

range through pink, salmon, apricot, rose, yellow and orange. No shrub surpasses them in splendour when they are in full beauty. There are numerous named varieties.

The rhododendron is perfectly easy of cultivation if planted in lime-free loamy or peaty soil that does not dry out in hot weather. A slightly shaded situation is to be preferred to one in full sunshine, though the latter is suitable providing the soil is deep. The two most important details of cultivation are to remove the faded flowers to prevent the development of seed pods and to mulch the soil with leaf-mould in April. When rhododendron bushes have become overgrown and need to be cut hard back this work should be done in April.

The evergreen greenhouse rhododendrons should be potted in a compost of sandy peat: a minimum winter temperature of 60° is suitable.

Two of the most beautiful are javanicum, yellow, and jasmiflorum, white. The white-flowered Veitchianum flourishes in a minimum temperature of 45° or 50°. The evergreen Rhododendron indicum, which bears a profusion of flowers in various colours in spring, is a favourite kind for forcing, and the mollis azaleas, which are imported in immense numbers, are largely grown under glass for early blooms.

RHODOTHAMNUS. Also called ground cistus, the Rhodothamnus chamaecistus is a dwarf shrub suitable for growing in a partially shaded position, in loamy or peaty soil in the rock garden. It grows about 6 in. high, and bears pink heath-like flowers during spring or early summer. Spring is the best time for planting, whilst propagation by cuttings may be accomplished in late summer. See *Layering*.

RHUBARB AND ITS HOUSEHOLD USES

How to Grow Successfully and Cook Appetizingly

The entries Forcing; Kitchen Garden contain further information bearing on this subject. See also Flan; Fritter; Pastry and other cookery entries.

The edible rhubarb is *Rheum raphaniticum*, a hardy perennial which thrives in a deep rich soil. The roots are planted in February, about 3 in. beneath the surface, and in rows 2 to 3 ft. apart every way. Before planting, some well-rotted manure should be worked into the soil. No stalks should be gathered from freshly planted rhubarb, and all flower stems should be removed.

Forced rhubarb is obtained by covering 2-year-old plants with headless casks or barrels and surrounding the latter with fresh manure or dry leaves. After large roots have been forced and cut, the old stools may be divided in March, and replanted. For forcing in artificial heat under glass, 3-year-old roots are the best. They should be lifted and placed in dark corners in the heated greenhouse, or in frames with bottom heat. Moisture and darkness are the conditions which are required in order that forced rhubarb may thrive best.

Some of the best varieties are Champagne, Albert, Victoria and The Sutton. All except Victoria (a late variety) are suitable for forcing. Of the ornamental kinds of rhubarb which are grown solely for the decorative value of the leaves and flowers the best are Alexandras, Emodii and palmatum. They are vigorous plants which flourish in ordinary soil and may be propagated by division in autumn.

Use in Medicine. The rhubarb used in medicine is obtained from the root of a plant grown in China and Tibet. It is one of the safest and most widely used purgatives for

children, and it has a secondary astringent effect which makes it particularly useful in checking diarrhoea. Rhubarb increases the flow of gastric juice into the stomach, stimulates the normal digestion, and also the liver. Consequently it is often prescribed in small doses as a stomachic.

Uses in Cookery. Rhubarb is widely used in cookery, being made into preserves, puddings, pies, compotes and many other sweets. Stewed rhubarb with custard is a very popular dish in spring. It should be used when young and tender. The stalks only should be cooked, these being first wiped with a damp cloth and then cut into convenient lengths. For stewing, pies, etc., a generous allowance of sugar is needed, the quantity varying according to the age of the rhubarb. Add a little water and about 2 in. of lemon rind. Young forced rhubarb and one or two varieties of young outdoor rhubarb stalks need not be peeled.

Rhubarb makes excellent pies to be eaten hot or cold. Use short crust pastry. The rhubarb should be cut into short lengths and need not be stewed previously.

Rhubarb Charlotte. Stew $\frac{1}{2}$ lb. rhubarb cut into short lengths in a pint of water, the grated rind and juice of a lemon, and $\frac{1}{2}$ lb. sugar, and when the fruit is soft, add the stiffly whisked whites of 2 eggs and $\frac{1}{2}$ oz. gelatine previously dissolved in $\frac{1}{2}$ pint water and then strained. Line the sides of a mould with sponge fingers, pour in the mixture and leave it to set. When cold, turn it out, and serve it with some vanilla-flavoured custard.

Rhubarb Chutney.

Stew 2 lb. rhubarb cut into short lengths with $\frac{1}{2}$ lb. sugar, and in the meantime mix together 3 minced onions, 2 tablespoonfuls fine salt, half that quantity curry powder, $\frac{1}{2}$ teaspoonful cayenne pepper, $\frac{1}{2}$ lb. stoned raisins, and about 1 pint malt vinegar. When the rhubarb is tender, pour the mixture over it, and stir the whole over the fire until it is well cooked. Then turn it into jars and tie it down.

Rhubarb Flan. Wipe 1 lb. rhubarb, cut it into thin slices, sprinkle it with 3 oz. castor sugar, and leave it for an hour. In the meantime make 6 oz. flan pastry and bake it a light brown. When the rhubarb has stood for the required time, let it cook slowly in the oven until it is tender, then put it aside to cool. Add more sugar if required.

When the pastry is cold, fill it with the rhubarb, reserving a few pieces for decorating the top, and over it heap the stiffly whisked whites of 2 eggs sweetened with 2 dessert-spoonfuls castor sugar. Put the flan back into warm oven so that the meringue may set and place a few small pieces of rhubarb on top. It should be served cold.

Rhubarb Fool. Rhubarb fool is made in the same way as gooseberry fool, $\frac{1}{2}$ lb. sugar being allowed to each pound of rhubarb.

Rhubarb Fritters. For these fritters, cut some young, tender rhubarb into pieces about 3 in. long, dip them in batter and fry them in boiling fat. When they are a golden-brown colour, lift them out and drain them, and serve them sprinkled with castor sugar.

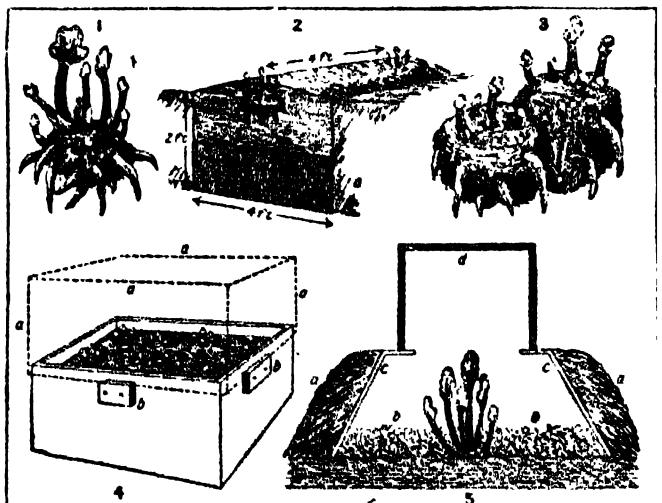
Rhubarb Jam. The ingredients are 1 lb. each rhubarb and sugar, $\frac{1}{2}$ oz. lump ginger and the rind of half a lemon. Cut the rhubarb into pieces about $\frac{1}{2}$ in. square and put these into a preserving pan with the sugar. Heat them slowly until the sugar has dissolved, then add the ginger, bruised and tied in a muslin bag, and the thinly peeled lemon rind tied in another bag. Bring the jam to the boil and continue boiling for about 1 $\frac{1}{2}$ hours, removing the ginger and lemon before putting it into pots and finally tying it down.

Rhubarb Pudding. A baked pudding can be made from 1 lb. rhubarb, $\frac{1}{2}$ lb. fine breadcrumbs, and sugar to taste. Peel and cut the rhubarb into short lengths, put a layer of it into the bottom of a deep greased dish, and sprinkle it with castor sugar. On the top put a layer of crumbs, and continue in this way until the dish is full, making the last layer of breadcrumbs. On top, place a few small pieces of margarine, and a little more castor sugar, and bake the pudding in a hot oven until it is lightly browned. A boiled rhubarb pudding can be made in a basin lined and covered with suet crust. Cover with greased paper and a cloth, and boil 1 $\frac{1}{2}$ -2 hours. See the directions for making Apple Pudding in page 27.

Rhubarb Wine. This fruit wine is made by cutting $5\frac{1}{2}$ lb. rhubarb into short lengths, leaving them unpeeled, and putting them into a wooden vessel. Mash them well to extract



Rhubarb. Showing the result of forcing beneath a barrel.



Rhubarb. 1. Typical root. 2. Good planting: a, manured soil. 3. Division of clump. 4. Forcing in a box: a, covering box; b, rests for same. 5. Another method: a, manure litter; b, straw; c, old zinc bath with bottom removed; d, covering box.

the juice, pour over them 1 gallon cold water, and leave the whole for eight days, stirring occasionally.

Strain and measure it, and to every gallon of liquor add $3\frac{1}{2}$ lb. white sugar and the juice of 1½ lemons. Stir the mixture at intervals until the sugar has dissolved, then pour the wine into a cask and leave it in a warm place to ferment. When fermentation has ceased, cork up the bung-hole and leave the wine in a cool place for about five months before bottling it.

RHUS. These hardy shrubs are grown for the sake of their ornamental leaves or flowers. The sap is poisonous. One species, *Rhus toxicodendron*, or poison ivy, is a dangerous plant, for touching the leaves may lead to serious illness in people who are susceptible. There is, however, no need to cultivate this plant, for several others are more decorative. The most familiar is the Stag's horn sumach (*Rhus typhina*) which has very long deeply cut leaves. The Venetian sumach (*Rhus cotinus*), known also as smoke bush, is very attractive when the cloud-like inflorescences are in full beauty in summer. *Rhus cotinoides* is valued for the sake of the brilliant autumnal colouring of its leaves. The sumachs, which

form large bushes, thrive in ordinary soil and are increased by seeds or root cuttings in spring.

RIB : Of the Body. There are 12 ribs on each side of the chest, of which the upper 7 are united by cartilages directly to the breast-bone. These are called true ribs. The remaining 5 are known as false ribs. Of these latter the eighth is joined by cartilage to the seventh, the ninth to the eighth, and the tenth to the ninth. The ends of the eleventh and twelfth ribs are free and for this reason these are called floating ribs.

Fracture of a rib is a common accident. Occasionally the fractured end may penetrate the lung. The symptoms of fracture are often very slight, but when such an accident is suspected, a doctor should be at once consulted. First and consists in applying the centre of a broad fold bandage over the painful spot and tying on the other side of the chest. According to the situation of the fracture another bandage is applied above or below the first. Their object is to limit the movement of the chest wall, but they should not be tight enough to cause pain. If any pressure at all is painful they should be left off. Later the doctor may continue with bandages.

ribbon. An attractive effect is obtained when 2 narrow ribbons are interlaced to form a lattice work, the ends being mitred and left free. Long sachet pads to line the bottom of a chest of drawers or wardrobe are made of perfumed wadding covered with coloured muslin, which is bound by ribbon in a contrasting colour.

Inexpensive shoe trees are made damtier if the wooden portion is painted or gilded and the metal bar is covered with about 1 yd. of 1 in. wide ribbon. The ribbon is doubled and gathered over the metal, the gauging being drawn up entirely to cover it. A looped bow in the centre of the metal bar may be added if liked.

Plaited ribbon and jap silk to tone make a pretty sachet set. Two different coloured double satin ribbons $\frac{1}{2}$ in. wide, should be obtained, the quantity needed depending upon the size of the sachets. Having cut out the silk for the cover and for the linings, the ribbon must be cut in lengths, each piece being in duplicate, one of each colour. The longest strip should go diagonally across the cover from corner to corner; the others follow in order of length.

The plating may now begin. Assuming the colours chosen are pink and deep rose, a pink strip is started from the left top corner and is carried across to the opposite one. This is stitched down to the edge of the cover. Across it lay a piece of rose ribbon, the shortest length used, and stitch the two ends of this down, one on the left side and one on the right. For the next two rows, one on either side of the first row, two lengths of pink ribbon are needed and over them a piece of rose-coloured ribbon is placed, this passing under the first strip. Two more pieces are then laid across, and over and under these a piece of ribbon of the other colour is plaited.

The work proceeds in this way until the whole is covered. It will be easy to see whether the alternating colours are in the right order; but other points need watching. The edges of the ribbon lengths should just touch one another, and the ends should not be cut until they are stitched down. The stitches must be small and neat and the lengths must be cut off slantwise. The corners need especial care, for here the ribbon is liable to bulge and refuse to lie flat. Care must be taken, too, that no uncovered spaces appear in the plating. When the plating is finished a cording of silk should be made to match the rose or pink, or the sachets may be finished off with a silk or tinsel bought cord or with a narrow gimp. For making up see Night Wear Cases and Sachets.

Ribbon Embroidery. For certain kinds of embroidery ribbon makes an excellent medium, the flower-embroidered cushion illustrated in Fig. 1 providing a good example of the work. Choose a design that is not overcrowded, transfer it to the material, and then stretch the latter on a frame. First embroider the stalks and leaves in thick silk, using stem stitch for the stalks and satin stitch for the leaves.

The large flowers should be rather paler than the small ones, and, if a chrysanthemum design such as that illustrated is chosen, make the undersides of the flowers a darker shade than the tops. Cut a piece of thin embroidery ribbon about 9 in. long, thread one end through a needle with a very large eye, and pull up from the centre of the flower. Hold the ribbon flat with the left hand and put the needle down through the material at the tip of the petal. Use 2 or 3 shades of ribbon, making any petals that are underneath darker than the rest. Do not pull the ribbon too tight.

Embroidery ribbons can be successfully used to work designs on tea-cosies, blotters and sachets. Bends may form centres to ribbon flower, or French knots in silk may be worked for this purpose. Many designs for raffia work

RIBBON WORK AND TRIMMING

Effective Uses and Methods of Making Applied Decorations

Directions for making accessories which can be charmingly trimmed with ribbon work may be found under such headings as Bag; Curtain; Cushion; Night Wear Case. See also Applique Work; Artificial Flowers; Embroidery; Laid Work; Ruffia; Transfer.

The simplest form of ribbon work consists of making bows, rosettes and gathered ruchings, the most elaborate is combined with embroidery or appliqué work, and used to decorate furnishing accessories. Although frequently seen on cushions it is perhaps most suitable for pieces of needlework such as bedspreads, pelmet and curtain borders, handkerchief and nightwear sachets. The raised or looped formations of ribbon, often

by folding ends of ribbon over without plating to form the desired size, and tacking them down. A shorter piece of ribbon is then folded in the same way, so that the shorter bows lie flatly above the longer ones, and stitched down. A flat tie-over strip is placed across the ribbon and finished off neatly at the back.

Ribbon rosettes are made in various ways. A small circle of stiff muslin or buckram is first cut out. To this are tacked the ribbon loops, any length desired, beginning at the edge and working towards the centre, longer loops being used towards the centre to make a rounded rosette. For another kind of rosette a wide ribbon can be used and folded over and the edges gathered strongly together. These are drawn up and sewn to the muslin or buckram foundation, beginning at the centre and working round to the edge. If a narrow ribbon is used it is not folded, and if one with a picot edging is selected it gives an attractive finish.

Wheel-like ribbon decorations which form corner trimmings for cushions or sachets are easy to make on a muslin foundation. The centre is of puffed or ruched ribbon, and the edges are finished with loops and ends cut diagonally, the effect being like a big daisy. Garters can be quickly made of ruched ribbon. Two lengths are needed of $1\frac{1}{2}$ yd. each of 1-in. wide ribbon. Contrasting colours may be used and stitching on both sides connects the two lengths through which an elastic, $\frac{1}{2}$ -in. wide, is run. The ribbon is gathered over this to the required size. The garters are finished with tiny rosettes or a ribbon flower.

Covering Small Articles. Ordinary wooden coat hangers can be made attractive when covered with satin or chiné ribbon. They need first to be padded with cotton-wool, sprinkled with sweet-smelling essence, or some perfumed powder, and then covered with ribbon gathered to fit the arms. One yard of 3-in. wide ribbon is enough to cover the wooden portion, and narrow ribbon to match is used to cover the metallic hook. At the base of this a bow, rosette or ribbon flower may be stitched if the hangers are being made for a gift or sale of work.

Ribbon-covered perfume sachets are easily made by sprinkling little pads of cotton wool with perfume or with sachet powder, covering them first with fine muslin, and then with



Ribbon Work. Fig. 1 Embroidered cushion the chrysanthemum heads being worked in narrow embroidery ribbon, while the stalks and leaves are in stem and satin stitch.

used in the work, make it less practical for hard wear than ordinary embroidery unless narrow ribbon is actually employed like a coarse thread, as in the example of the cushion illustrated in Fig. 1.

Bows and Rosettes. Even a bow for trimming requires to be properly made, especially if the ribbon is wide. Leave an end and form a loop with small plait, twist it round with cotton. Repeat the making of loops, measuring their length carefully until the required number is made. Arrange the loops to lie in even numbers each way and leave an end to match the one at the beginning. Make a tie over with a separate piece of ribbon, sewing it tightly or loosely according to taste. Flat bows are made



can be adapted for ribbon work. These narrow ribbons can also be used according to instructions given in the article on *Laid Work*, being pressed down on to the material instead of being pulled through. More elaborate embroidery can be done in this manner, which is suitable for working designs on fine fabrics.

Raised Ribbon Work.

Sprays of flowers which can be made separately and then applied to trim cosies or sachets are not difficult to make with a little practice. Roses are effective flowers for this type of ribbon work and details of making are illustrated in Fig. 2. For the centre of a rose cut a strip of pink taffeta ribbon $1\frac{1}{2}$ in. by 7 in. Fold it in half lengthways and gather twice as shown in B. Draw up the two threads tightly and finish off. Roll up and stitch firmly (C). Next take an oblong $2\frac{1}{2}$ in. by 2 in. to make a petal. Fold it in half lengthways and slope off the edges to the fold, as shown in D, and gather round the raw edges, folding over each edge at the fold. Draw up the thread and fold this finished petal over the centre (E). The other petals should be each a little longer and wider and shaped as shown in Fig. 2, F. When all the petals are separately made, stitch them round the central ones and the rose is finished, as shown in G.

The leaves are from green ribbon cut $1\frac{1}{2}$ in. wide by 2 in. Fold it in half lengthways and slope off the top (H). Gather down the point and the fold (J), then draw up, turn the ribbon right side out, and open up the leaf. Flatten out, pleat the base into proper shape and stitch it down firmly (K).

The various pieces of the spray can be first sewn on to a piece of muslin if liked or applied directly on to the article to be decorated. No stalk is visible in the spray illustrated in Fig. 2, A, but one is easily made by taking a short length of string, twisting a narrow green ribbon round it, inserting a leaf and continuing

to twist for the desired length. For a bud have an oblong (on the cross of the pink ribbon used is wide enough) $2\frac{1}{2}$ in. by 2 in. Fold it in half lengthways and the corners to the centre (L). Pleat it twice each side so that the pleats meet in the centre (M). Cut a piece of ribbon the same shape, slightly larger and fold round the first piece (N). Make a cup from the green ribbon 1 in. wide, cut as for the leaf (H), fold in turnings down the V shaped end, fasten one point to one side of the bud and the other point to the other side. Wrap the cup over and twist ribbon below to make the stalk (O).

Ribbon Fern. This is the popular name of a greenhouse fern, *Pteris serrulata*.

RIBBON GRASS. This name is given to a vigorous

and Edward VII. *Ribes speciosum*, the fuchsia flowered currant, should be grown on a wall; it bears crimson, somewhat fuchsia-like flowers.

RIBSTON PIPPIN. The dessert apple known as Ribston Pippin is of medium size, russet brown in colour, and possesses a flavour second only to Cox's Orange Pippin. It is a self-fertile variety, requiring a warm, well-drained soil, and is in season from November to January. See Apple—Dessert.

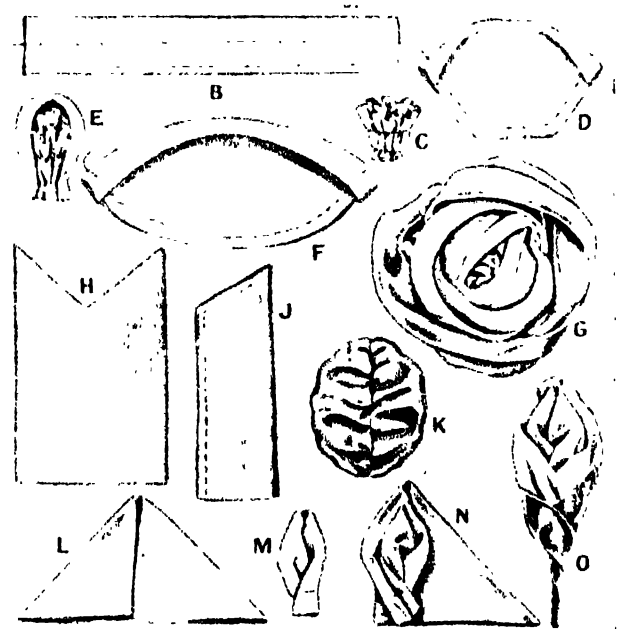
RICE: The Food. Being very light and easily digested rice forms a valuable article of diet, but as it is almost entirely a starchy food and deficient in protein, meat or pulses should be taken with it. Its good value is increased by cooking or serving it with milk. On the average rice contains about 80 per cent of starch, 7 per cent of protein, fat less than $\frac{1}{4}$, water 12, and a trace of mineral matter.

When it is boiled rice absorbs about five times its weight of water. If not sufficiently boiled it is liable to cause indigestion. To many people one of the disadvantages of rice is that it has a slight binding effect. This fault can be corrected by eating it with prunes, stewed fruit, or jam. But in cases of looseness of the bowels this effect makes rice a valuable remedy.

The polished rice, which is commonly used, is deficient in the vitamin which prevents beri-beri. This has been removed in the thin skin. Where the dish consists almost wholly of polished rice beri-beri develops, but there is not this danger in a mixed dish including milk, eggs, etc.

Two kinds of rice are employed, of which the pure white Carolina is usually preferred for puddings. Rice flour and ground rice are also much used for cakes, etc. The former is much more finely ground than the latter. Curry is served with Patna rice, which has long, pointed grains that separate easily after cooking. Rice should always be thoroughly washed before using, and to boil plainly should be scattered into fast boiling salted water, keep the lid off the pan and boil for about 15 min.

An excellent rice and apple sweet can be made from 4 large apples, $\frac{1}{2}$ lb. rice, 4 teaspoonfuls castor sugar, 4 cloves, and a little apricot jam sauce. Boil the rice in salted water for about 10 min., then strain it, and divide it into six equal portions. Grease four small basins, and put a portion of rice in each, pressing it to the sides and bottom so that it acts as a lining. Peel and core the apples, place one in each basin, together with 1 teaspoonful sugar and a clove. Then divide the two remaining portions of rice into halves, and cover the apples with them, pressing the rice well down. Put a piece of greased paper



Ribbon Work. Fig. 2. Applied ribbon trimming spray of garden roses made of pink and green taffeta ribbon, with diagrams for cutting out and sewing. See text.

perennial grass with pretty green and white leaves (*Phalaris amabilis* variegata). Known also as gardeners' garters, it flourishes in ordinary soil, grows 2 ft. high and is increased by division in autumn. *Phalaris canariensis* provides the well-known seeds for cage birds: it is an annual raised from seeds sown in spring.

RIBES. The family name of the currant and gooseberry is *Ribes*. In practice, however, the name is usually applied to the flowering currants, which are grown for decorative purposes only. These shrubs thrive in ordinary soil, and may be planted at any time during the autumn, winter, or early spring. The only attention they need is pruning after flowering, and a top dressing of well decayed manure in autumn. Propagation is best effected by means of seeds sown in the autumn, or by cuttings, layers, or suckers struck at the same period.

The chief kinds are aureum, fragrant yellow flowers; aurantiacum, yellow, and sanguineum, red. There are several varieties of the latter, of which the best are atrosanguineum



Ribbon Grass. Close growing clumps of the decorative border plant. The variegated leaves are very attractive in bouquets, or in vases of cut flowers.

over each basin, and steam the contents for about an hour, or until the apples are soft and the rice tender. When the moulds are cooked, turn them out on to a hot dish, and serve them with a sauce made by boiling two tablespoonfuls of apricot jam with a gill of water.

Rice Gâteau. Boil together 18 lumps of sugar and $\frac{1}{2}$ gill of water until they become a golden brown colour, then use them to coat the inside of a hot pudding basin. Wash $\frac{1}{2}$ lb. rice and cook it, until it is soft, in a saucepan of boiling water; then drain it, and mix it in a basin with 2 oz. butter or margarine.

Leave the mixture to cool before adding 3 oz. granulated sugar, $\frac{1}{2}$ lb. seedless raisins, and a little vanilla flavouring, and when these are well mixed, stir in 2 beaten eggs mixed with 3 or 4 tablespoonfuls of milk. Turn the whole into the caramel-lined basin, cover it with a greased paper, and steam it for 1 hour in a saucepan of boiling water. The water should reach no higher than a third of the way up the basin. When the mixture is cooked turn it on to a hot dish and decorate it with cream. The caramel will be found to coat the pudding.

Rice Meringue. Cook $\frac{1}{2}$ lb. rice in a pint of milk until it is soft and has absorbed all the liquid, and let it cool a little before adding sugar to taste, and the beaten yolks of 3 eggs.

Pile the mixture up high on a flat dish, spread a thick layer of jam over it, and on top of this put the whites of eggs, sweetened and whipped to a stiff froth. Dredge the whole with castor sugar, and then put it in a warm oven for a few minutes so that the meringue may set and become lightly browned.

Rice Pudding. The requisites for a rice pudding consist of 2 oz. rice, 1 pint. milk, 1 oz. sugar, 1 oz. butter or margarine, and a little grated nutmeg. Wash the rice and mix it in a pie dish with the sugar, pour over the milk, and on top grate the nutmeg, adding the butter with it. If time allows, stand the pudding aside for about an hour before cooking it, so that the rice may soften; then bake it in a moderately warm oven for $1\frac{1}{2}$ to 2 hours, first bringing it to the boil and then letting it cook slowly. Another method is to put the rice with water to cover in the pudding dish, and cook in the oven until the rice swells and softens. Then add milk, etc., and proceed as above.

Rice Soup. A thick rice and tomato soup can be made from 2 oz. rice, a large tin of tomatoes, a carrot and an onion, a pint stock, a few celery seeds, and pepper and salt to taste. Put the rice, together with the peeled and sliced vegetables, into a saucepan, add the tomatoes with their liquor, the stock, the celery seeds tied in muslin, and the seasoning.

Bring all to the boil and then cook them slowly until the rice and vegetables are soft, stirring occasionally to prevent the rice from sticking to the pan. Then take out the celery seeds, rub the soup through a sieve and re-heat it. If it is not of a good colour, add a few drops of cochineal.

Rice Water. For sick persons and convalescents rice water is a cooling drink. To make it, wash 1 oz. Carolina rice, soak it for 3 hours in a pint of warm water, then boil it for an hour and strain it. To check diarrhoea rice water is thickened with conglass, a teaspoonful to the pint. Cinnamon stick, clove, or lemon may be added to flavour the drink and a little sugar if desired.

A pleasant and also nourishing beverage for an invalid is made by boiling a tablespoonful ground rice with $\frac{1}{2}$ oz. candied peel cut small in $1\frac{1}{2}$ pints of good milk. The rice is first mixed into a smooth paste with cold water and should be boiled for at least $\frac{1}{2}$ hour and then strained.

Risotto. For a dish of risotto, fry a chopped onion in 2 oz. butter or margarine in a stew-pan, then dilute it with $1\frac{1}{2}$ pints stock. Stir in $\frac{1}{2}$ lb. prepared rice, and cook for 20 min., stirring frequently. When swelled, sprinkle in 3 oz. grated cheese, 1 gill tomato sauce, a grate of nutmeg, and seasoning. Cover the pan for a few minutes, and serve very hot.

Another savoury way of cooking rice is known as rice à la Milanaise. This dish can be prepared by boiling some rice as directed for curry making, draining it thoroughly, and then trying it lightly in smoking hot fat. When it begins to brown, sprinkle in enough grated cheese to give it the desired flavour, and add some cold, cooked, and shredded fish, poultry, or game, and seasoning to taste. Mix and heat the whole thoroughly, and then serve it on a hot dish. See Curry; Ground Rice; Kedgeree.

RICE FLOWER. The Australian over-green flowering shrub *Pimelea*, or rice flower, grows about 3 ft. in height, and there are pink and white flowering varieties. It requires greenhouse treatment.

RICE PAPER. Thin, delicate paper made from the pith of the plant *Tetrapanax papyrifer*, which grows wild in Formosa, or from the sap of *Aeschynomene*, cultivated in China. Rice paper was originally used for water-colour painting by Eastern artists. It is used for making good-quality artificial flowers. An edible rice paper, first made in China and Japan from rice straw, is used in cooking, and for good quality cigarettes.



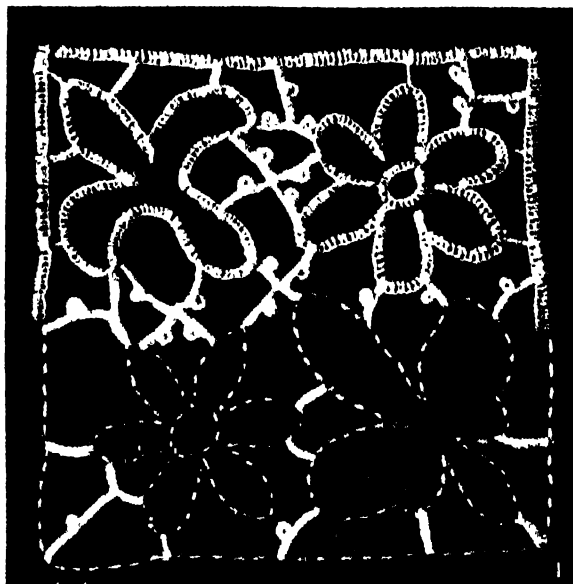
RICHARDIA. This is the botanical name of the white and yellow arum lilies which are so much valued for cultivation in pots under glass. The common white arum lily, *Richardia* (or *Calla*) *aethiopica*, is a South African herbaceous perennial which bears large white flowered spathe in winter and spring under glass: in mild districts it may be planted by the waterside out of doors.

The usual method of cultivation is to pot the roots in Sept. in a compost of loam with a little decayed manure, keep them in a frame for 6 or 8 weeks and then force them into bloom in a heated greenhouse. The soil must be kept thoroughly moist when the plants are in full growth. When the flowers have faded arum lilies may be planted out of doors for the summer or gradually dried off in the

flower pots. In September they are repotted. The yellow arum lilies, *Elliottiana* and *Pentlandii* bloom in summer under glass. During the winter the roots are at rest, the soil in the pots being kept dry. In February they are repotted and started into growth in a warm greenhouse.

RICHELIEU WORK. Although this form of decorative needlework comes under the class of linen embroidery and is mentioned in the general article on Embroidery, it is so effective and wears so well that fuller details are here given. It can be used on house linen, and for dress, and women's and children's underwear. It can be worked equally well on crêpe-de-Chine, silk, and linen. Floral, geometrical, and figure designs are used as motifs.

The materials required are the ground material such as those mentioned above, embroidery cotton of loose twist, linen lace thread, or embroidery silk, according to the ground material. All these working threads



Richelieu Work. Fig. 1. An effective form of linen embroidery consisting of motifs of conventional or original design joined by worked bars. Fig. 2. Adaption of ladder work for a border, showing the use of buttonhole-stitch.

are made in many sizes, and that which is used should correspond with the texture of the ground material. A firm thread is used for the outlining, while a softer twist may be employed for the bars and filling stitches. Ordinary long sewing needles are required and a pair of small embroidery scissors, very sharp, and with fine points, as the material has to be cut away right under the pearl edge.

A transfer design is needed, suitable for this work. It should have bold patterns for the motifs, which are held together with worked bars. Those who can do free-hand drawings can make their own designs and trace them on the material with the aid of carbon paper. In the design illustrated four small motifs are placed together and an outline drawn to form a square; this can be varied with a diamond, circle, or other shape to suit the purpose. Black has been used for the material so that the white stitchery should show up more clearly. This in reality would be ugly and the needlework always matches the ground material in colour.

Richelieu work in its original form consisted only of buttonholed motifs and buttonhole bars with bullion picots; but in its modern form it is mixed with Reticella work, hence the appearance of twisted bars and woven bars. Filling and veining stitches are introduced to make the motifs more interesting. Stem

stitch, back stitch and satin stitch are the most used together with French knots for flower centres. After the design is transferred to the material, work over all the outlines of motifs and the outside edge of the design with small running stitches, then proceed to work the bars. By the old method the outlines were buttonholed first and the bars laid as they were reached; but experience has proved that stronger work is the result of working all the bars first and passing a buttonhole-stitch through the end of each bar as the outline progresses.

Working the Picot Bars. The lower part of the illustration shows the outlined motifs and the connecting bars worked in various ways. To work a bar with bullion picot, secure the thread on the wrong side of the material and bring it up on the main outline of design; pass the needle under one of the stitches on a small motif, picking up a tiny piece of the material. Pass the needle back again under the stitch on outside of design, then back again under the stitch on the motif; there should now be three threads laid. Now buttonhole from right to left half way across this bar, placing the stitches close together.

When the centre of the bar is reached make a picot thus. Pass the needle up through the last buttonhole-stitch made, to about two-thirds of its length, holding the needle in place with the right thumb, and with the left hand twist the thread ten times over and round the needle, from right to left, pushing the twists towards the eye of the needle, but still keeping the right thumb on them. Draw the needle through with the left hand until the thread can be felt pulling under the thumb; then remove the latter and draw the needle through. Pass the needle up from below through the last buttonhole-stitch, draw through, and continue buttonholing to the end of the bar.

A bullion picot often comes on the outside edge of a piece of work, when a Richelieu border forms the edge of a towel, for instance, and in this case the picot is worked on the outline of the design. When the needle is inserted in the last stitch the thread is passed under and round the needle from right to left; push the needle through the twists, pull up the thread so that the spiral forms a semicircle, then continue to buttonhole the outline until the next picot occurs.

Where the space to be spanned is wide cross-bars are used as seen in the centre of the illustration between the two motifs on the upper half of the design, and where a space is long, branched bars are worked as seen at the lower left-hand corner of the design. In order to work the cross-bars lay three threads obliquely across the space, fill one half with buttonhole-stitches and a picot in the centre; now lay three threads from the last buttonhole-stitch to the opposite corner of the space to make the third arm of the cross. Fill with buttonhole stitches and a picot, and bring the needle up through the last stitch at the centre. Lay three more threads right opposite to form the fourth arm of the cross. Bring up the needle again through the centre of the bars and fill the remaining fourth arm, which is half of the first long one laid.

A branched bar has the first threads laid between one motif and another, half of which is buttonholed with a picot halfway if the space permits. If it is a short space, the picot is omitted. Then the threads are laid for the branch bar either to the outline of the design or to another motif, as the case may be; work this bar in the usual way, then the needle is passed under the first bar and the remaining half is worked to match.

Twisted and Woven Bars. Twisted bars have only one thread laid, the second is twisted two or more times round it according to the

length of the bar. This should only be employed where strong linen thread is used for working or where the space to be spanned is quite short, as between points of petals and the outside line in the illustration. Woven bars have three threads laid, and the needle taken under and over each thread as in darning, always taking the working thread round the outside edge of the laid threads.

To work the main outlines buttonhole from left to right as in scalloping, so that the pearl edge comes on the outside of the motif and on the inside of the square outline seen in the illustration. When all the buttonholing is done the material has to be cut away under the pearl edge, taking care not to cut the bars. In the illustration the top half of the material is cut away and shows how the bars connect the motifs.

Ladder Work Borders. On a linen of loose texture effective borders to Richelieu designs can be worked with buttonhole edges and bars under which the material is cut away.

Draw two threads about $\frac{1}{2}$ in. apart. These will form two lines for the buttonholing, the pearl edge coming on the drawn thread line. Begin at the bottom left hand corner and work upward, buttonholing the whole side, then turn the work so that the opposite edge or line will be at the left, and proceed to work upward as on the opposite side. When about $\frac{1}{2}$ in. is done begin to lay a bar, the distance between the bars depending on the fineness of the material, and according to how much work it is desired to put into it. The illustration given has been enlarged in order to show the detail more clearly. Pass the needle upward through the pearl edge of the buttonhole stitch exactly opposite, now cross the ladder and pass the needle up through the pearl edge of the last buttonhole-stitch made on the second side of the ladder. Cross the ladder again and pass the needle up through the same stitch, on the opposite side. There are now three threads laid, and these should be buttonholed as shown, working under the threads only, not through the material, as this will be cut away afterwards. Continue buttonholing on the second side of the ladder for $\frac{1}{2}$ in., or according to the space to be left, then work another rung. When all the work is finished cut away the material right under the pearl edge, taking care not to cut the stitch, and buttonhole the cut ends at the top and bottom of the ladder. See Embroidery; Transfer.

RICKETS. A nutritional disease of children, rickets, or rachitis, usually begins in the period between the sixth and the thirteenth month. An important factor in its production is the absence, or even shortage, of the supply to the tissues of a substance described as vitamin D. This vitamin is present in sufficient quantities in the mother's milk when this is good. If, however, the mother's milk is thin, or if a child is fed on grasy foods, even with the addition of fat in the form of margarine, there will be starvation as regards this essential vitamin. This may apparently occur, also, if a child suffers from constant indigestion, especially if diarrhoea is present.

A deficiency of the anti-rachitic vitamin is made good if the body is sufficiently exposed to ultra-violet rays, either in natural sunlight or artificially produced. Fats deficient in the vitamin acquire it by being submitted to these rays.

Rickets begin insidiously, but sooner or later the child becomes restless and peevish, with a certain amount of fever and free sweating, from the head especially, when it sleeps. There is great tenderness over the body, the slightest touch being resented. The appetite and digestion are impaired, and commonly there is constipation alternating with diarrhoea. The child tends to become pot-bellied. Another symptom is that teething is delayed.

The ends of the long bones become swollen, so that the wrists and other joints are unduly large, and there are rows of enlargements down each end of the chest in front. The child is slow in beginning to walk; the muscular weakness may be so great as to suggest paralysis.

As time goes on, the frontal eminences on the skull become enlarged, producing a broad, square forehead, and sometimes portions of the skull towards the back of the head become thin and papery. The bones of the legs bend, causing bow leg or knock knee, and there is commonly flat foot. The spine develops a hump and the walls of the chest are flattened; the breast bone may be pushed forward, a condition described as pigeon breast. Sometimes, however, particularly if there is nasal obstruction, as from adenoids, the breast bone is depressed, forming the funnel-shaped chest. Children suffering from rickets are prone to certain nervous troubles, such as convulsions, tetany, and a spasmodic type of choking, known as laryngismus stridulus.

It is most important to prevent rickets. This can be done by giving a child the diet, the sunshine, the fresh air, and the exercise which it requires.

A list of foods containing vitamin D is given under the heading Diet. If natural sunlight is not available, a course of treatment by artificial ultra-violet light should be procured, if possible. Cod-liver oil is a very valuable addition to the diet, but should be given in an emulsion, or with malt, in view of the difficulty of digesting the plain oil.

The child should not be allowed to get on its feet until the bones are sufficiently strong, and to prevent its doing so it may be necessary to attach long splints to either side of the body and the corresponding limb. When tenderness has disappeared, gentle massage of the muscles should be employed, however. See Bow Legs; Convulsions; Diet; Light; Vitamin.

RIDDLE. More usually known as a sieve, this is an implement used for separating coarser material from that which is finer. See Sieve.

RIDGE BOARD. The topmost timber of a roof which is known as the ridge board is a horizontal board, and runs along the ridge or apex of the roof. The upper ends of the rafters bear upon it. See Corrugated Iron; Rafter; Roof.

RIDGING: In Gardening. This is a method of cultivation which exposes the largest possible area of ground to frost, snow, rain and wind, which help to disintegrate hard lumps and render the soil friable. It is carried out in autumn or early winter, and is done by throwing up the soil in the form of ridges.

RIDING. A good rider must have good hands and a good seat. Hands, by which is understood a natural sensitiveness and responsiveness, together with a capacity for understanding animals ridden, cannot be acquired; they are born. The rules for good riding are summed up in the lines, "Your head and your heart keep up, your hands and your heels keep down. Keep the knees close to your horse's side and elbows close to your own."

To mount a horse the rider should face its left side and, standing well forward, gather the reins up short in his left hand. He should take care not to hold the off rein tighter than the near one, as that may make the horse move in a circle with the prospective rider on the outside of it.

Having with the left hand, which still holds the reins, taken a firm grip of the horse's mane, he should steady the near stirrup with the right hand and then put his left foot into it. He should place the right hand on the further side of the cantle, or back of the saddle, and keeping the right leg straight and high, so as to swing clear of the croup, should spring on to

the horse. He then steadies the right stirrup, into which he places his right foot, and is ready to start.

Both hands should hold the reins, the knuckles being upward, not downward as when driving. They should exert only the minimum amount of pressure necessary to control the horse. The rider should learn, however, to grip with the thighs, knees, and sides of the legs, but should not grip hard unless it is necessary. The reins should be kept vertical and the feet parallel to the sides of the horse. When going slowly he should keep the ball of the foot on the tread of the stirrup, but when galloping he should push it further through. See Bit; Bridle; Horse; Pony; Saddle, etc.

RIFFLER FILE. A riffer file is a double-ended file of peculiar formation, comprising a plain metal part, or bar, curved at either end, these ends being cut to form the teeth of the file. They are made in a wide variety of shapes and coarseness of cuts, and are invaluable when working hollow and rounded shapes in metal, fibre, or other material.

This type of file is used largely for cleaning up the corners and angles in chasings and engravings. It can be manipulated in odd corners in a manner that would be impossible with any other tool. See Casting; File.

RIGOR MORTIS. The stiffening of the muscles which occurs soon after death is known as rigor mortis. The commencement and duration of the rigidity vary considerably. See Death.

RIM LOCK. In this type of lock the case has a rim round it by which it is fixed with screws to the surface of the door. The bolt, or bolts, shoot into a box staple fixed in position on the door jamb in the ordinary way. This type of lock is more unsightly than the mortise lock, owing to the case being exposed, but it has the advantage of not weakening the door to the same extent. For this reason, it is very extensively used. In better-class houses it is only fitted to the domestic rooms, such as the kitchen and servants' quarters, spare bedrooms and the like. See Latch; Lock.

RIND. The peel or skin of fruits and vegetables is called the rind. The outer skin of pork, ham, or bacon also is spoken of as the rind. In reality this term means an outer crust. To rind is a north country equivalent for to render. Preparing and clarifying fat and butter by melting is to rind or render. See Candied Peel; Clarifying.

RING; In Jewelry. Two ancient designs in rings are still often reproduced. One is the snake ring and the other is seen in the gemmed rings with clasped hands, of which some fine specimens have been preserved. One in the Lonsborough collection is of silver with two hands clasped, and on one side of each of the twin hoops there is an engraving, showing that this ring belonged to some personage of high rank in the 16th century. There are earlier examples in the Braybrooke collection, not only with twin hoops but also with three hoops, a fine one dating from the end of the 15th century.

Signet rings were used for signing documents from a very early date, while the Egyptian scarab was mounted on a ring and worn as a charm against evil. An interesting old ring is illustrated in Figs. 1-2. Deadly poison was contained under the ornamental top, which could unobtrusively be opened and the poison

dropped into wine or food. Rings were used in connexion with betrothals and weddings from the earliest times.

Rings connected with ecclesiastical usages have always been regarded as symbolical of dignity and authority by priests, and on all state occasions there is a special ring that is invariably worn by the Pope. The stone in this ring contains a very fine cameo of the head of Christ. The stone from which this cameo is cut is a peculiarly beautiful specimen of a blood-stone. This ring is placed upon the Pope's finger immediately after his election, and it is handed down from one Pope to another.

Thumb rings were frequently worn, and many of these are in private collections or in museums. Some are regarded as of great value, and are known as decade-rings, having ten projections at intervals round the shank, which were used as beads for repeating Aves. Many of these rings are engraved with the figures of saints. A favourite inscription on the signets or the inner lining of the shank on religious rings is that of St. Christopher, the patron saint of Roman Catholics, as regards protection in times of accident or danger.

Silver rings are not frequently found; but in all well-known collections there are many specimens that are made of iron, also of other base metals with enamel. Some beautiful specimens of glazed earthenware rings have been unearthed at various times, set with very fine mosaic ornaments or with cornelians or lapis lazuli.

Care of Rings. The cleaning of gem rings

should be regularly undertaken if the gems are set in open settings. Diamond rings can be placed in hot water, and then a soft tooth-brush should be applied to the backs of the stones, and any dirt or dust should be carefully brushed away from the setting. Rings can be dried best by covering them in a small receptacle containing very fine boxwood sawdust, which has been heated. They should then be brushed with a soft, dry brush.

A simple method of cleaning gems in finger-rings, providing the stones are not foiled, is to

brush the backs of the stones through the open setting with a moderately stiff toothbrush which has been dipped in a small quantity of whisky or gin. The spirit evaporates, and thus saves the necessity of drying them.

In all cases where imitation or foiled coloured stones need cleaning, these should never be touched with anything moist, and must not on any account be immersed in water or brushed with a damp brush. Imitation stones are usually covered at the back with a foil, and it is necessary that this should never be allowed to become damp. The best method for cleaning foiled stones is to brush the settings round them with a bristle brush, to which a small quantity of powdered chalk should be applied.

Rings containing valuable gems should be left occasionally with a practical jeweller to examine the settings through a microscope, and to remedy any defects that may be discovered in the settings.

The simplest way of removing a tight ring from the finger is to wash the hand in cold water, rubbing the joint of the finger with plenty of soap. If this method fails, draw three or four lengths of thread across a piece of soap, put them through the finest needle that will take them, and then pass the latter between the ring and the finger, drawing the threads after it.

If the point of the needle is kept slanting upwards there will be no danger of pricking the finger. Hold the threads close to the finger, then slip the ring along them. It will usually be found to work off quite easily. If neither of these methods is successful, it will probably be necessary to have the ring filed. The hand should never be washed in hot water when a ring is to be removed, as heat causes the finger to swell. See Jewelry; Napkin Ring.

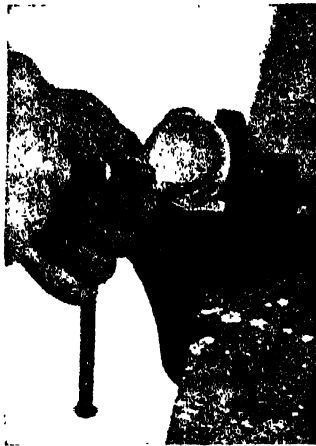
RINGING; In Gardening. A process sometimes adopted for the purpose of inducing vigorous barren fruit trees to bear fruits. It consists of cutting out narrow rings of bark all round or almost all round the branches; if the rings are only one eighth of an inch wide they may encircle the branches, if wider than that the rings must not be completed. April is a suitable month for this work.

RINGWORM; How to Treat. The term ringworm is commonly applied to certain skin diseases caused by parasitic fungi. It may be found on the scalp, the beard, non-hairy parts of the body, and the nails.

Ringworm of the scalp, which is highly contagious, is characterized by the appearance of one or more roundish, partially bald patches, the skin being red in colour and covered with fine greyish scales. The disease is more common in children than in grown people. One of the commonest means of spreading it is by using the brush and comb or wearing the cap of a child suffering from the disease.

The disease is treated by the application of parasitocidal lotions or ointments. Every day the whole scalp should be thoroughly shampooed with soap and hot water. Then the more patently diseased hairs, which will come away easily, should be plucked out with a fine pair of tweezers. Finally, a colourless iodine should be applied once or twice daily to the patches. The treatment must be continued for a long time. The treatment which gives the quickest results when obtainable is the exposure of the patches to the X-rays.

RIP SAW. This is a hand saw particularly adapted for cutting in the direction of the grain of wood. The teeth are specially shaped for that purpose, the front of them being vertical instead of sloping slightly backwards, as in the cross-cut saw. It facilitates the cutting of long lengths of timber, cutting rather faster and more freely than the ordinary saw. In use, a rip saw should be worked up and down at a fairly steep slope. See Saw.



Riffer File. Cleaning up the interior of an awkwardly shaped casting.



Rings. Some examples of antique rings. Fig. 1. 16th or 17th century poison ring in gold, the lid of poison box engraved with winged Eros or Cupid. Fig. 2. Poison ring shown open. Fig. 3. 17th century ring set with small diamonds in form of basket of flowers. Fig. 4. Scaraboid ring engraved with Egyptian scarab. 17th dynasty, modern setting. All are slightly enlarged to show the details.

Courtesy of, Spink & Son, Ltd.

RISSOLE. To make cold meat rissoles, press 6 oz. cold cooked meat, weighed after it has been trimmed, through the mincer twice, adding 2 shallots and 3 sprigs parsley, then make a thick sauce with 1 oz. margarine, 1 oz. flour, 1½ gills stock, 1 teaspoonful lemon juice, and seasoning of salt and black pepper. Add also a pinch of ground mace. The flour should be tried with margarine, and the stock should be well flavoured with vegetables. Add the minced meat to the sauce, mix, and spread the whole on a plate to cool. Chicken and game can be used, with the addition of a little bacon.

Meanwhile prepare a small quantity of rough puff pastry using about 6 oz. flour and 5 oz. butter or lard and margarine mixed together. This pastry should be rolled about the thickness of a penny. If the pastry is too thick it is liable to become too deeply coloured before it is cooked, or before the meat is heated right through.

Roll the pastry out into a square, then sheet then take portions of the mixture (about 1 dessertspoonful) and lay these in a row along the near edge of the pastry, leaving about 2 in. between each and keeping the heaps far enough from the edge to allow of the pastry being folded over a little beyond the mounds. Now wet the edge of the pastry, fold the flap over the heaps and press them with the thumbs in shape of a half circle. Cut out each with a 3 in. fluted cutter.

The rissoles are now ready to be egged and crumbed, and should be fried in deep boiling fat. Use a frying basket, and shake them while frying gently to detach them from the sides of the basket and from each other. Dish on paper and garnish with fried parsley.

The rissole may be fried without any coating. When so treated, the half circle is laid on a floured plate, turned over quickly and then fried as if egged and crumbed. It must not be dipped in flour, but only dusted with it.

Fish Rissoles. Lobster makes good rissoles. Cut the meat of a very small lobster into dice, add to these 1½ gills good white sauce, 1 teaspoonful lemon juice and seasoning, also a little anchovy butter. Mix all thoroughly together and heat up to boiling point in a small saucepan. Cool the mixture, make it up into rissoles, and fry in the manner previously directed.

Almost any kind of fish, is suitable for rissoles, but he mixed with good white sauce and p... Cooked fish should be used, and 4 oz. will need 1½ gills sauce. With the more delicate varieties of fish add a little cream to the sauce.

Cheese Rissoles. For these mix 1 dessertspoonful cornflour with 1 gill milk, then cook and stir them over gentle heat for a few minutes. Move the pan to the side of the stove, and when its contents have cooled slightly add 1½ oz. grated cheese, the yolk of an egg, and a small piece of butter or margarine. Add pepper and salt to taste, and a little mustard then turn the whole on to a plate and leave it to cool. When it has set, form it into rissoles, using a little flour to make it adhere, coat each with beaten egg and breadcrumbs, and fry in smoking hot fat. Drain, and serve at once, grating a little cheese over each.

ROCK CRYSTAL. A variety of colourless or nearly colourless and transparent quartz, rock crystal is found in different forms in many parts of the world. In all forms it is an expansive, hard mineral, being fusible only by 1 teaspoonful of flame and the electric seasoning. Beat up is impervious to most sufficient of this to bind exactly the together then take teaspoonfuls of shape them like eggs.

Roll ¼ lb. pastry on a floured board to the thickness of notepaper and then cut it into neat rounds with a pastry cutter or the lid of a tin. Put a ball of egg forcement on each round, wet the edges of the pastry, and close them together by folding one edge over like the flap of an envelope. Egg and crumb these, and fry them a delicate brown in smoking hot fat. See Anchovy Butter Jam Rissole, Pastry.

RIVETS AND RIVETING EXPLAINED

Practical Information for the Amateur Mechanic

The metal worker should consult the articles under the heading of Metal also Cutting Repousse, Riveting, also adapted to Crochets, Pocket Knife, Perambulator, etc.

A rivet is a metal peg, resembling a short nail, which is clinched over at the ends after being driven in place, as shown at Fig. 1. It provides a permanent fixing for two plates or for the attachment of objects with thin ears, or lugs, to plate work. Rivets are used in many ways in other spheres than engineering and metal work. For example, soft metal rivets are employed to fasten the parts of leather and textile work together, and also for attaching metal fittings to bags and straps.

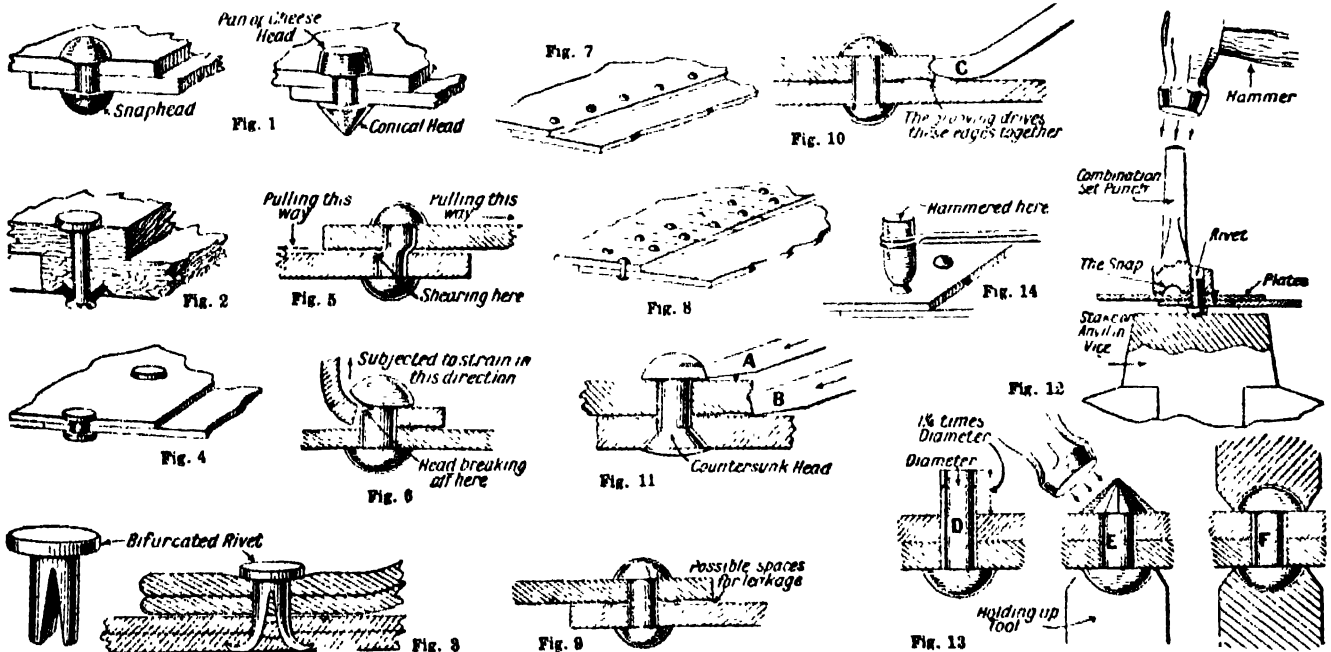
For use on wood, as in the planking of small boats, copper rivets or nails are employed with washers or burs of the same material. The rivet is driven through the two planks, and the washer put on and closed up to the work. The superfluous projection is nipped off and the end riveted over the washer as in Fig. 2. The head of the rivet must be supported by a heavy hammer, or other suitable mass of metal.

When leather or a like material is being joined, it is necessary to provide rivets with heads of a large area and washers of a corresponding size. When a metal fitting is being

riveted on to leather, it almost always takes the place of a washer. Bifurcated rivets used in leather work have large, flat heads and a shank divided into two prongs. When driven into leather of suitable thickness and the job is resting on a metal surface, the prongs turn up, hook fashion, into the lower surface of the leather. The result is a good fixing, as will be seen by reference to Fig. 3.

When using a bifurcated rivet a suitable hole should be made in the parts and the rivet inserted. The work is then laid on a block of wood (end grain is best) with the prongs downward. The rivet is driven home, so that the prongs project, and the work levered up from the block, when the prongs can be prized apart and hammered over into the leather. The head of the rivet should rest on the vice or some other metal surface.

Large flat-headed rivets are used in joining thin metal sheets. They may be made of any material—aluminum, copper, tinued or plain iron—comparable with that for which the rivet is used. The generic term for this style of rivet is tinman's rivet (Fig. 4).



Rivet. Fig. 1. Three types of rivet heads. Fig. 2. Rivet used with a washer for joining two planks. Fig. 3. Bifurcated rivet used in leather work. Fig. 4. Tinman's flat-head rivet. Fig. 5. Showing the tendency of metal plates to shear the rivet when the latter is not securely fastened. Fig. 6. Result of an unusual strain on a rivet. Fig. 7. Single riveted lap joint. Fig. 8. Double riveted lap joint. Fig. 9. Possible space for leakage between two plates. Fig. 10 and 11. Caulking and fullering to prevent this leakage. Fig. 12. Driving the plates together by means of a hollow punch. Fig. 13. Three stages in forming a snap head. Fig. 14. Another type of punch used in riveting.

Where the rivet is of a metal dissimilar to that of the plates being joined it should be that of the softer of the two. All rivets should be quite soft. If found to be too hard, so that the heads break off, the rivets should be annealed.

Joining Metal Plates. Riveted joints in metal plates requiring to be secured to each other in the strongest possible manner should be made so that the rivets themselves are subjected only to a shearing stress. This means that the strain should be such that the two plates tend to cut the rivets in the same manner as the blades of a pair of scissors, as seen in Fig. 5. There should be little or no tendency to pull the head off the rivet, as is shown occurring in Fig. 6. For thin sheet metal work, rivets from $\frac{1}{8}$ in. to $\frac{3}{8}$ in. are commonly employed. The spacings may be from $\frac{1}{2}$ in. to 1 in. respectively.

Rivets in tanks and boilers subjected to pressure, and those used in steel structures, usually have a diameter equal to about twice the thickness of the plate. The spacing depends upon the kind of joint and the relative strengths. For a single riveted lap joint, as illustrated in Fig. 7, the spacing would be about five times the single-plate thickness. Rivets under $\frac{1}{2}$ in. in diameter are usually driven cold. A single riveted lap joint of good design has a tensional strength of only about 55 per cent of the solid plate. In a double riveted joint, as at Fig. 8, the proportionate strength may rise to 70 per cent. In no case can a riveted joint be made as strong as the original plate unless the plate is thickened up in itself at the rivets.

Caulking and Fullering. In larger work, that is to say, where plates of over $\frac{1}{2}$ in. are employed, the joints are made pressure tight against liquids and gases by caulking and fullering. Although the plates may be drawn closely together around the rivets, they may not touch each other between them, as indicated in Fig. 9. There may be small open spaces under the heads and around the stalks of the rivets capable of creating a leak. The process of caulking and fullering burrs the metal over at these places. It is done by blunt chisels of various shapes, and requires skill and experience to be a success. Fig. 11 shows at A the edges of a rivet being caulked over; at B, the plates of a single riveted lap joint are being similarly operated upon. The use of a fullering tool is shown at C in Fig. 10. In a thin sheet metal object such caulking is impossible, and the same result may be accomplished by soldering, brazing, or welding.

Forming the Snap Head. In order to pull together the plates of a riveted joint in sheet metal preparatory to hammering the rivet over, a hollow set punch may be used. Fig. 12 shows a combination set punch having in addition a recess, or snap for forming cup or snap-headed rivets. The holding-up tool used beneath may also be provided with a sinking to suit the shape of the rivet being driven, and act as a snap in addition.

To form a snap head, the projection of the shank of the rivet before it is hammered over should be about $\frac{1}{4}$ times its diameter, as shown at D, Fig. 13. The final neat rounded shape is obtained by the use of the rivet snap, as at F, after the head has been formed roughly into a conical shape, as shown at E. The blows, in the first part of the operation, should be delivered at an angle, following around the rivet with a hammer of suitable weight. It should not be hit directly end on in the centre. The only exception to this method would be in the case of a countersunk rivet, as in Fig. 11, where the metal would for the most part be spread out by means of directly central blows.

The holes in the plates may be drilled, or punched out in a machine for the purpose. In either case, the burr thus formed

should be removed so that the sharp edges of the holes are slightly chamfered, or rounded. A drilled hole is to be preferred to a punched one, as the metal around a punched one is weakened in the operation, and the strength of the plates is thus locally impaired.

Rivets for cold driving should always be thoroughly annealed before use. Iron rivets are to be preferred for this purpose, as the heads of steel rivets are apt to crystallize when hammered over cold. Copper rivets used in a pressure-tight joint, to be soldered subsequently to riveting, should be tinned before use. This will ensure their taking to the solder. First they should be cleaned by dipping in nitric acid. The use of countersunk or flush rivets should be avoided wherever it is possible, especially in cases where the rivets are subjected to the slightest tensional stress. A pan head, or snap (cup) headed rivet is much to be preferred. Rivets should be purchased with one head already formed. Plain wire should only be employed where both heads are of the countersunk form, and where the rivet is a long one.

ROACH: The Fish. The best season for this fresh-water fish is from early autumn until the end of March, and it should not be eaten before the beginning of August. To tell when roach is in good condition, examine the fins and the scales; the former should be red in appearance and the latter smooth to the touch; if rough, the fish is not good. To prepare the fish, wash it, scale and gut it, and then wash again in clear water.

Roach may be boiled or fried. To boil, wipe the fish and score them each side in 3 or 4 places. Put them into a stewpan and just cover them with lukewarm water. To each quart of water add 1 tablespoonful vinegar, 1 dessertspoonful salt, a bouquet garni, and 1 tablespoonful grated horseradish. Simmer from 12 min. to a quarter of an hour, and serve with parsley or anchovy sauce.

For frying, prepare the fish, washing them well in salted water, then wipe them quite dry. Dip in seasoned flour and fry them in a frying-pan in butter, or in deep boiling fat. When the fish are brown and crisp dish them on a dish paper, and brush them with a little butter, which should be ready melted, and scatter over them dried and sifted sage, with seasoning of pepper and salt. The sage should be heated, and must be used sparingly. Garnish with fried parsley and cut lemon.

ROAD. Except on private roads, of which there are only, comparatively speaking, a few in existence, all persons have the right to travel on the roads at any time they like. As regards pedestrians, this right is unrestricted, save by the danger from moving vehicles; but drivers of motor cars, carts, carriages, and the like are legally bound to observe certain regulations, known as the rule of the road. They must also stop when directed to do so by a policeman on duty. Where a structure is erected on a road, the local highway authority may compel the person who erected it to remove it.

The extensive use of the roads by motorists has led to special regulations for this form of traffic (for which see the article on *Motoring*) and also, on the part of the associations of motorists, to special measures of assistance.

Warning Signs. To facilitate the safe and proper usage of the roads warning and direction signs of a distinctive character have been erected. At many road junctions and corners a white line is drawn in the middle of the road to induce vehicles to keep to their proper side. Traffic signs must now be of the size and type prescribed by the Ministry of Transport.

Roads and Property Owners. The owners of property have certain liabilities and duties with regard to the upkeep of roads. A householder who lives in a street which has not been

taken over by the local authority is bound to bear his share of the cost of keeping the road in order, according to the length of his frontage to the road. Before a street is taken over the local authority will always require it to be properly made up at the expense of the owners of the property abutting on or served by it. In most towns and many rural districts the procedure is under the Public Health Acts or under the Private Streets Works Act. Street for this purpose includes a highway, road, lane, square, court, alley, or passage, whether a thoroughfare or not.

The first step is for the local council to pass a resolution to do such works as they deem necessary to any street or part of a street which is not sewered, levelled, paved, metalled, flagged, channelled, made good and lighted to their satisfaction. They must say whether they intend to proceed upon a mere frontage basis, or to take into account any works previously done by the owners or occupiers of the premises; or to take into account the greater or less degree of benefit to be derived by the respective premises. They may assess any premises which do not immediately front, join or abut on the street, but access to which is reached from the street via a passage or otherwise. They may resolve to pay some or, indeed, all of the expenses out of the rates; but this is rarely done. They may include in the works the bringing of the street into level with other streets.

Further Work of the Local Authority

The council's surveyor next makes plans and specifications, and prepares an estimate of the cost, and submits to the council a provisional apportionment upon the several premises intended to be charged. In the absence of a special resolution, as above, the only premises which can be charged are those fronting, adjoining or abutting on the street, according to their frontage. Places of worship and burial grounds are not chargeable, but their share of any street making must be borne by the rates.

Once a street has been taken over by the local authority its repairs and maintenance becomes a charge on the rates, and not on the individual property owners. The most common objection to street works is that they are unreasonable, e.g. that the sewer proposed is too small, or unnecessarily large. A local authority may, however, lay an unnecessarily large sewer if they bear the surplus cost themselves. Again, an owner may object that the street has already been sewered once. After the scheme is finally approved by the justices, the authority proceed to do the work; and, when they have completed it, make a final apportionment on those liable, in the same proportions as the provisional apportionment.

Notice is served on the owners, any of whom may, within three months, object to pay. The only ground of objection is that the apportionment has not been validly made.

The cost of the work becomes a charge on the premises from the date of the completion of the work. Therefore, if A buys a house the owner of which has had the proper notice, and he sells it to A free from incumbrances, the owner must bear the cost of the paving, etc., if the work is completed before the day fixed for completion of the contract of sale. Otherwise A must pay. As between the owner and a tenant of a house, the owner is liable to the local authority, but if the tenant holds on a lease wherein he has agreed to pay, in addition to rates, all imposition and charges imposed on the landlord in respect of the house, the landlord may claim reimbursement from the tenant. The local authority may make the amount payable by instalments spread over 30 years with 5 p.c. interest, and recover each instalment from the tenant, the latter in turn being able to deduct it from the rent. *See Rates.*

ROASTING : Of Meat. Before attempting to roast or bake meat, preparations should first be made for heating the oven, either by building up a good fire and pulling out the damper over the oven or lighting the gas, or switching on the electric current. Gas or electric heat should be turned on at least 20 min. before the oven is needed. The kind of meat to be cooked, its shape, proportion of lean, fat, and bone, must all be taken into consideration.

The time required for roasting various kinds of meat and joints is given under the different headings, Beef, Lamb, Pork, etc., and in the comprehensive time-table below.

To prepare the joint quickly, scrape, wipe, trim, and tie it in shape. The use of string is better than skewers, as the holes made by the latter allow the nutritive juices to escape. Be careful that the loins and neck are jointed. Score the skin of pork with a sharp knife, and rub it over with a little salad oil. The greased paper over fatless meat, such as veal, to prevent it from drying and scorching, always removing the paper for the last 20 min. to let the joint brown.

Put the joint on the trivet in a double baking tin, if possible. The water in the lower pan keeps the dripping from burning and causing an unpleasant smoke. Alternatively, put a second tin, containing water, on the shelf below the joint, or add a gill of water to the tin in which the joint has been placed, adding more as it evaporates.

Place the joint in the hottest place in the oven for the first 10 min. This is most important, the object being to harden the meat-albumen on the surface, and thus seal up in the meat the juices that give flavour and nutriment. Then slacken the heat, so that the joint is cooked through, not dark nor burnt on the outside and raw in the centre. After the preliminary sharp heat, the rule is: the larger the joint the slower the oven.

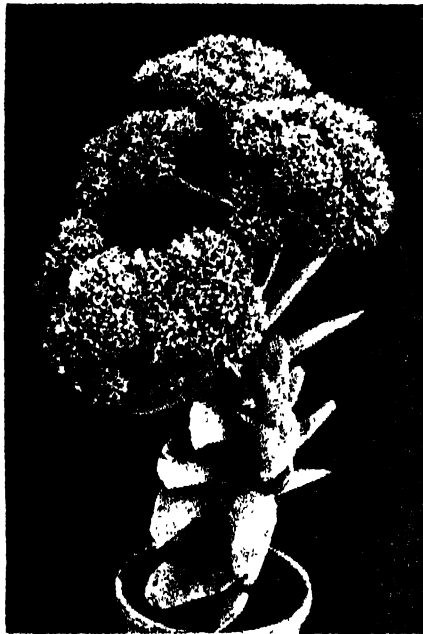
Basting the meat, that is, pouring a few spoonfuls of the hot dripping from the tin over the meat, should be done frequently, to prevent it drying and shrivelling. When cooked, place the joint on a hot dish, and remove the string. Keep the meat hot while the gravy is made. Clear gravy is served with beef, mutton, lamb; thick with veal, pork, and stuffed joints.

	Weight	How Cooked	Average Time
Bacon	4 lb.	Boiled	2 to 2½ hr
Beef	12 "	Roast or Baked	4 to 4½ hr
"	6 "	"	1½ to 1¾ hr
" Salt	6 "	Boiled	2½ to 3 hr
Brisket of Beef (fresh)	6 "	Stewed	3½ to 4 hr
Calf's head	"	Boiled	3 to 4 hr.
Ham	10 lb.	"	4 to 4½ hr
Lamb, leg of	5 "	Roast or baked	1½ hr
Mutton, leg of	7 "	"	2 to 2½ hr
"	7 "	Boiled	2½ hr
" shoulder	5 "	Roast or baked	1½ hr
Ox tongue	6 "	Boiled	3 to 3½ hr
Pig's head	"	"	2½ to 3 hr
Pork, leg of	8 lb.	Roast or baked	2½ hr
"	6 "	Boiled	3 hr
Sausages	"	Fried	10 to 15 min
Sheep's head	"	Boiled	1½ to 2 hr
Sucking pig	"	Roasted	2½ to 3 hr.
Veal fillet	6 lb.	Roast or baked	2½ to 3 hr
Venison	6 "	"	" to 4 hr

Robinia. See False Acacia.

ROCAMBOLE. A member of the onion family, rocambole is often called Spanish garlic, but is much milder than the true garlic. It is of perennial growth, and produces clusters of bulbs at root and stem, the former of the two being the most suitable for propagation.

Cloves, or divisions, of bulbs are best planted in spring in light soil 2 in. deep and 6 in. apart. If preferred seed may be sown in drills at the rate of ½ oz. per 25 ft., crops taking about 8 months to reach full maturity. Bulbs should be



Rochea. Greenhouse pot plant with crimsom flowers and succulent leaves

lifted when the foliage becomes yellow, and placed in the sun to dry, afterwards tying them in bunches and storing them in a dry place. See Garlic; Onion.

ROCHEA. These greenhouse plants bear succulent leaves and flat bunches of showy flowers in spring or summer. They are easily grown in pot in a compost of well-drained sandy loam and need a minimum temperature of about 50 degrees. During the winter months they need comparatively little water. Propagation is by cuttings inserted in pots of sandy soil in spring. Rochea coccinea, with scarlet flowers in summer, is the favourite kind.

ROCK BUN. Plum ½ lb. buns or rock cakes can be made from ¼ lb. butter or margarine, ½ lb. flour, 3 oz. caster sugar, 2 eggs, salt, and ½ teaspoonful baking powder. Rub butter into flour, add sugar and eggs (beaten), also flavouring of vanilla. Mix all, and drop the mixture, with two forks, in small rocky heaps on to a tin lined with greased paper. Cook the cakes in a moderately hot oven until they are lightly browned and firm to the touch.

To make fruit rock cakes, mix together ½ lb. flour, a pinch of salt, and 1 teaspoonful baking powder; then rub in 3 oz. butter or margarine, and add 3 oz. sugar, ¼ lb. cleaned currants or sultanas and 1 oz. mixed peel, cut up finely. Stir a beaten egg into the mixture and then a little milk, keeping the whole to the desired stiffness. Bake the cakes as directed in the previous recipe.

ROCK CRESS. This name is popularly given to the white aubria. It is a low-growing, spreading plant much used in the rock garden and for spring flower beds; it thrives in ordinary well-drained soil and is increased by cuttings in June. The plants should be hard pruned after flowering. Aubrietia is the purple rock cress. See Aubrietia.

ROCK CRYSTAL. A variety of colourless or nearly colourless and transparent quartz, rock crystal is found in different forms in many parts of the world. In all forms it is an extremely hard mineral, being fusible only by the oxy-hydrogen flame and the electric furnace. Rock crystal is impervious to most acids, hydrofluoric acid being practically the only exception.

A modern use of rock crystal is in the construction of lenses for photographic and optical work, the pebbles for which are obtained in Brazil. Large crystals, used in optical work, are found in the northern parts of Madagascar. The yellow stone of Madras is a form of rock crystal that is cut and polished and is then fashioned into ornaments. See Lens.

ROCKER. The curved pieces added to the legs of a chair to permit it to oscillate, or rock, to and fro are known as rockers. They are also used on cradles.

A projection or lever arm attached to a shaft that is capable of motion in alternate directions is known as a rocker arm. This mechanism is found, for example, in the overhead valve gear of a motor car or motor cycle engine.

ROCKERY. This term is commonly used in reference to a small rock garden or a mound of soil and stone so arranged as to provide a miniature representation of a rock or Alpine garden. Often a rockery is but a heap of soil and stones set in a shady part of the garden and planted with ferns, London Pride, and a few other common plants. But if it is in a sunny place and built correctly many choice Alpine or mountain flowers can be grown in a rockery. It should be constructed in the way explained in the note describing the rock garden (qv).

ROCKET : The Plant. This is the popular name of an old-fashioned hardy perennial plant (Erysperis matronalis). Belonging to the wallflower family, it bears fragrant purple flowers in summer; the variety alba has single white blooms. The double rockets, with white, blue, or purple flowers, are very beautiful, but more difficult of cultivation than the single kinds; they should be increased by cuttings inserted in sandy soil in a frame or greenhouse in late summer. There is no difficulty in raising the single rockets from seed in early summer. Both single and double rockets flourish in ordinary well-filled soil.

ROCKFOIL. This is the popular name of saxifrage, a large group or genus of charming flowering plants chiefly suitable for cultivation in the rock garden, adding greatly to its attraction. See Saxifrage.



Rocket. A delightful perennial suitable for a sunny bed or border. This variety is well known for its delicate perfume

ROCK GARDENS: THEIR CONSTRUCTION

And the Plants that Give the Best Results

The reader of this article is referred to the entries on the various plants and flowers suitable for the rock garden, e.g. *Aubretia*, *Columbine*, *Edelweiss*, *Fern*, *Gentian*, *Heron's Bill*, *Moss*.

The building of rock gardens, both large and small, on which to cultivate alpine or mountain plants has made remarkable progress in late years, and this is not a matter for surprise, for no plants are more fascinating than those which grow wild on the alpine heights of Europe and other countries. Most of them bloom in astonishing profusion and provide an enchanting display chiefly in spring and early summer. Most of them can be cultivated to perfection in this country in a properly constructed rock garden.

The secrets of success are to choose a site in a sunny place and to provide thorough

with soil made firm. Most alpine plants root deeply, and unless there is a fair depth of soil between the rocks they may deteriorate or even perish in dry weather. It is a mistake to place one rock or stone directly on another, there should be a good layer of soil between them, for many alpine plants flourish best in crevices between the rocks.

Ordinary non clayey garden soil may form the bulk of the material used in the rock garden; sand, leaf-mould and gritty material such as broken stone or brick, must be mixed in freely. Such a compost will suit numerous plants; others which need special soil can be

provided for at planting time by taking out holes and filling them with peat, or whatever is needed. If the available site is narrow, care must be taken not to build too high, otherwise the plants are almost certain to suffer from the effects of drought in summer.

The best time to put in rock plants is in September, October and early April. As they are grown in small pots by nurserymen they can, however, be planted at any time, though it is unwise to set them in winter. In spring and early summer the rock garden must be watered very freely in dry weather, for it is then that the growth of the plants is most active. They ought to be watered thoroughly a few hours before being planted. It is an excellent plan

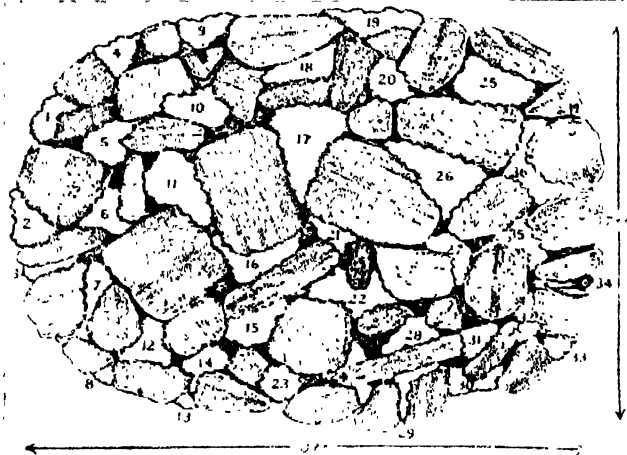


Rock Garden. An attractive rock garden and waterfall against a background of trees and shrubbery. Courtesy of Ralph Harcourt & Son.

localities where natural rocks are difficult to obtain, stone-trimmings may be procured from a stoneyard, these being cemented together to form large blocks. If stone-trimmings are not available, and the cost of natural rock is too heavy, bricks may be secured from a brick kiln and, if necessary, cemented together with thin cement. Brick rubbish may also be adapted, or blocks of old concrete.

There are disadvantages in the use of cemented material because of its imperviousness to water and its ugly appearance; nevertheless, plants may be encouraged to thrive in such environment, provided they are planted in deep pockets of suitable compost. It is necessary to be frugal in the use of rock, making every piece firm in its position.

Plants for the Garden. There is an immense number of alpine and other plants suitable for cultivation in a rock garden. The following is a selection of beautiful and easily managed kinds. All bloom in spring or early summer. The commonest are *Aubretia*, yellow *Alyssum*, white *Arabis* and *Iberis* or evergreen *Candytuft*, all of which are easily grown in



Rock Garden: An effective arrangement of plants. 1. *Anemone hepatica caerulea*. 2. *Androsace alpina*. 3. *Campanula Raineri*. 4. *Primula denticulata cashmiriana*. 5. *Achillea argentea*. 6. *Adonis pyrenaica*. 7. Rock yarrow. 8. Alpine pink. 9. *Honseleek*. 10. *Aubretia*, Dr. Mules. 11. *Arabis alpina*. 12. *Aethionema grandiflora*. 13. *Gentiana acaulis*. 14. *Lychnis Lagascea*. 15. Double cold daisy. 16. *Erigeron aurantiacus*. 17. *Iberis coraeifolia*. 18. *Aubretia*, Mrs. Lloyd Edwards. 19. *Saxifraga apiculata*. 20. *Erodium macradenum*. 21. *Anemone pulsatilla*. 22. *Linum tenuifolium*. 23. *Saxifraga aizoon*. 24. *Edelweiss*. 25. *Phlox amoena*. 26. *Aubretia*, Fire King. 27. *Lychnis viscaria*. 28. *Incarvillea grandiflora*. 29. *Saxifraga bursaria*. 30. *Geranium Lancastriense*. 31. *Primula Forestii*. 32. *Daphne rupestris*. 33. *Ranunculus pyrenaica*. 34. *Gentiana acaulis*. 35. *Saxifraga Campou*. 36. *Lithospermum prostratum*.

drainage. Alpine plants are thoroughly hardy, and do not succumb to frost, however severe, but they will not flourish in ill drained soil. Perfect drainage is of the first importance.

There are innumerable ways of building a rock garden; it is scarcely possible or advisable to work to a set design. The aim should be to make it as natural in appearance as possible, whether it be a miniature representation of a mountain chain, a boulder strewn slope, a rocky valley, or merely a grouping of rocks and soil arranged informally.

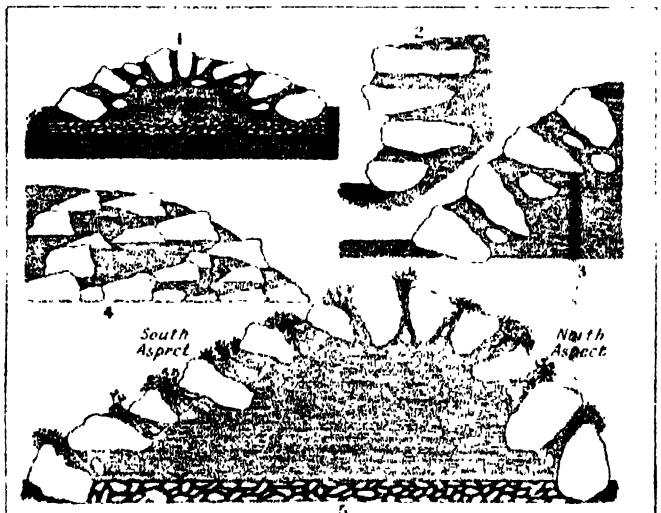
If the soil is clayey it should be excavated to the depth of 10 or 12 in., this space then being filled with stones or broken bricks for drainage. On naturally light land no such preparation is required. In setting the rocks care should be taken to place most of them on their broadest bases, and to ensure that they are firmly embedded in the soil; they should slope towards the mound of soil, not away from it. Very few, if any, of the rocks should be placed on end; they have such an unnatural appearance. Here and there, however, to ensure a bold rock group or greater variety of outline it is permissible to set some on end. A limited number of large rocks or stones is more effective than numerous small ones; it is difficult to build a rock garden of distinction with the latter.

As the placing of the rocks proceeds, soil must be placed behind them, care being taken to see that all spaces between them are filled

to place a layer of stone chips on the soil round about choice plants; this helps to keep the roots moist and that is essential to success. Vigorous spreading plants, such as pink, *Aubretia*, *Alyssum*, dwarf *Phlox*, *Iberis* or evergreen *Candytuft*, and *Arabis* should not be set near choice kinds, or the latter may be overrun and spoilt.

Stone for the Garden.

The choice of a stone for building should be well considered. In many parts of Great Britain igneous rocks, slates, shales, sandstone, and limestone are readily obtainable, and of these the latter is unexcelled for rock-work, except in its crumbling form. Limestone in its best forms is beautiful alike in colour, outline, and texture; it possesses also the porosity that is essential for the conveyance of moisture direct to the roots of alpine plants. In those



Rock Garden: how to arrange the stones. 1. Simple rock garden with base drainage. 2. Bad placing of stones. 3. Good placing. 4. Typical rock formation. 5. Good method of planting in pockets and fissures.

Courtesy of Amateur Gardening

well-drained soil in a sunny place. The bellflowers are very beautiful, especially *campanula pusilla*, which bears a profusion of tiny blue bell-like flowers. Other good ones are *garganica*, G. F. Wilson, *pulchra* and *marialis*, all of low growth, and *carpatica*, which grows about 12 in. high. Most of them like slight shade.

The silvery saxifrages are indispensable. They flourish if planted in sunny pockets or crevices of gritty soil among the rocks, mortar rubble or a scattering of lime should be added. A few beautiful sorts are *Aizoon*, *Engleri*, *lingulata*, *Cotyledon*, and *cochlearis*. The mossy saxifrages form moss-like evergreen cushions, and bloom very freely in spring. They need well-drained soil in sun or shade. *Wallacea*, *hypnoides* and *muscoides* are a few of the best. The Cheddar pink (*Dianthus caesius*) is easily managed in gritty soil, and edelweiss (*Leontopodium*) flourishes in stony, loamy soil. *Veronica teucrium dubia* bears masses of lovely blue flowers and thrives in ordinary rock garden compost.

Other indispensable sorts are the primula, *frondosa* and *hirsuta* dwarf phlox, rock jasmine or *androsace*, yellow flax (*Linum catharticum*), stonecrop or *sedum* and houseleek. Many of the gentians are somewhat difficult; they may grow, but often fail to bloom. One of the most reliable is *Gentiana septentrionalis*.

Miniature bulb flowers should be planted in autumn. The hoop petticoat, angel's tears and cyclamen flowered daffodil, squill, snowflake, and glory of the snow. The spring seeds of low growing annuals may be sown to fill spaces here and there; suitable kinds are toadflax (*Linaria*), portulaca, leptosiphon and violet cress (*Leontopodium*). Dwarf varieties of conifers, *daphne*, *rhododendron*, and other shrubs are often used in turning a rock garden.

ROCKING CHAIR. In a rocking chair the legs are mounted on curved rails, or rockers, so that the chair can be rocked backward and forward by a slight effort on the part of the occupant. See Chair.

ROCKINGHAM WARE. Two classes of pottery known by this name should be clearly distinguished. There is the ever-popular ware consisting of a cream-coloured earthenware body, covered with a lead glaze heavily stained with manganese oxide, which imparts to it a rich purplish brown bloom, resembling a warm madder. This was introduced about 1788 by the Swinton works near Rotherham, and named after the Marquess of Rockingham, on whose land the factory stood. It was at its best down to 1806, the earlier pieces having a pleasing variation in the glaze, which darkened as it slowly flowed down.

The modern Rockingham glaze, which is made at many factories at home and abroad, tends to be flat and uniform, but in technical excellence modern Wedgwood and Ridgway Rockingham surpass anything ever done at Swinton. Pieces to collect include also the antique Cadognans—which were lidless puzzle-pots filled from below, usually in the form of a peach, and a sprig of blossom for the handle—as well as the Toby snuff takers, often described as portraits of the great American, Benjamin Franklin. The old mark was Brameld, with or without Rockingham Works. The Rockingham family crest of a griffin was adopted in 1823.



Rockingham ware. Plate of this ware made about 1823.
British Museum



Rock Garden. The blocks of stone have been laid out in rough terraces. On these terraces, between the crevices of the rocks and even on the shallow steps, cluster such dainty rock plants as columbine, saxifrage, gentian, white rock cress, candytuft, aubretia, and a host of others.

Courtesy of Arnold Arboretum

There was also an output of cream coloured and other ordinary wares, including dishes and plates enamelled with sprays of flowers, identified by the botanical name written on the back. After 1806 much gaudy ware was turned out, and after 1820 porcelain was also made. This continued down to 1842, when the factory was closed. A characteristic form of tea-sets had the views painted inside the cups, with a simple gold design outside.

ROCKING HORSE. There are two main types of this toy, one somewhat simpler than the other, and each can be bought in several sizes and in various qualities of material and fittings. The simpler type is mounted upon two curved rockers, the other on roller bars. It is advisable, when buying, to choose a thoroughly strong horse; otherwise it will not stand the rough usage in the nursery to which it will probably be put. Most of these toys are portable, but in some cases the horse is fixed to the nursery floor.

ROCK ROSE. This is the English name of *rustus*, a group of beautiful flowering shrubs, most of which are suitable only for planting in well drained soil and a sunny place. The hardiest is *Cistus laurifolius*, 4 ft., white. Other beautiful sorts are *crispus*, 3 ft., rose colour; *florentinus*, 2 ft., white; and *ladaniferus*, 3 ft., white and red. They flourish best in warm, southern gardens where the soil is dry. Propagation by cuttings in summer or by seeds in spring.

ROCCO. This word is used in both architecture and furniture design for a style that is marked by an excessive use of curves and other forms of ornamentation, including shells, rockwork, scrolls, and foliage. It is usually introduced without regard to the constructional character of the work, and the figures are jumbled together.

This style prevailed in France and elsewhere in Europe in the 18th century, especially in its latter part. A few pieces of furniture by Chipendale and other English designers are in the rococo style, but these are by no means their best work. See Louis Style.

ROD: The Measure. This measure of length, which is also called a pole or perch, and is much used in measuring land for allotments, etc., consists of 5½ yards, or 16½ ft. Forty rods make a furlong. A square rod consists of

30½ square yards, and 40 square rods make a rood. In brickwork a rod or rood consists 16½ ft. by 16½ ft., i.e. 272¼ cubic ft. It contains about 4,500 bricks and about 75 cubic ft. of mortar.

RODGERSIA. These are hardy ornamental plants which are grown in the bog garden, or in other deep, moist soil. One of the most striking is *Rodgersia aesculifolia*, which has large, handsome leaves and bears spikes of white flowers in summer. *Pinnata*, with bronze coloured leaves and cream-white flowers, is another striking plant.

RODINAL. This is a photographic developer with paramidophenol as the reducing agent and sodium sulphite as preservative. The original developer of the paramidophenol class was a German patent. Similar developers of British make are azol, central, kodol, and rylol. They are all concentrated solutions which keep exceedingly well and only require the addition of water for use. See Developer, Paramidophenol.

ROE. The milt or spawn of fish, which is known as roe, may be cooked in the fish or removed and made into savoury dishes. The soft roe is used in the preparation of savouries and hors d'oeuvres, and the hard roe also has its culinary uses. See Cod's Roe, Herring; Hors d'Oeuvres, Salmon.

ROGER DE COVERLEY. This is one of the old country dances and has its own individual time. The dancers form up in two lines, men on one side, women on the other, partners opposite to each other. The top woman and the bottom man then chase between the lines with their right hands extended, take hands and turn round, after which they return to their places. The top man and bottom woman do the same.

The manoeuvre is repeated by the original couple, this time with the left hand, and is followed by the second couple as before. Next time they circle round each other back to back, and finally bow and curtsy. In each case the second couple follow.

When all these figures have been done the leading woman and man face towards the top of the room and, wheeling outward, lead the other couples down to the bottom. Here they take hands and form an arch, beneath which the other couples pass. The couple which

originally began the dance is now at the bottom of the row, while a fresh couple is at the top, and the dance continues as before. It follows that each couple goes through the figures twice, once when at the top of the row and once when at the bottom.

Roll. See Braid.

ROLLER BEARING. The essential difference between the roller and the ball bearing lies in the point of contact. With the ball-bearing the point of contact may be said to be a mathematical point, whereas with the roller bearing it is a line equivalent to the length of the rollers. The roller bearing provides a far greater bearing area, and a much heavier load can be sustained than by the ball type of equal size. With the latter, light thrust loads are borne by the point of contact of the balls with the groove in which they run; heavy thrusts are catered for by the specially designed thrust bearing that is usually employed in conjunction with a journal ball bearing.

Owing to the absence of a groove in the races of the roller bearing, a thrust load is not possible, and to overcome this a roller bearing is produced having taper rollers that run in taper races. This will take a heavy thrust in one direction; where opposed thrusts are present, two bearings are employed. See Ball Bearings; Lubrication.

ROLLER SKATE. Several kinds of roller skate are manufactured, the best being those fitted with ball bearing wheels. They are made in several sizes, and generally each size is adjustable within certain limits. The wheels are made in boxwood, aluminum and steel. Roller skates should be strongly made, and, as serious accidents may occur through the use of skates made of cheap materials, it is advisable to purchase only the best quality.

The rollers should be kept well oiled, using a good quality lubricating oil. For rollers with plain bearings thin oil should be used, but for ball bearings it is advisable to use a thicker oil of the mineral kind which will not dry. Rust may be avoided by keeping all the metal parts rubbed over with vasoline. It is not enough merely to wipe the parts over with a vasoline rag; the metal surfaces must be thoroughly well rubbed with a soft rag impregnated with vasoline. If the skates are to be placed on one side for any length of time, it is advisable to wipe them over with melted tallow.

Small repairs, as new axles, wheels, screws, and rubber pads, can be done at home, but the necessary materials should be purchased. Parts can be obtained from the makers generally much cheaper than they can be made at home. See Skate.

ROLLY-POLY PUDDING. There are several varieties of this pudding: the plain suet roll, currant roll, or plum duff, jam roll, treacle roll, and raisin roll. These are all boiled. The roll is sometimes baked instead, and filled with jam, syrup, or a kind of Banbury cake mixture. When baked, the crust is often made with dripping or dripping and butter mixed. See Pastry; Suet Crust.

ROMAN HYACINTH. Bulbous-rooted plant grown in Great Britain for winter flowering indoors. The white flowers are smaller and daintier than those of the stiff-growing Dutch or summer-besiding hyacinth. The bulbs should be potted, in soil or fibre, during August and September, the pots (after watering) then being placed under a layer of sifted ashes outdoors or in a dark cool cupboard, until plenty of roots have been produced, which should be in about 6 weeks. The plants should then be exposed to the light. See Hyacinth; and illus. under Bulb.

ROMNEYA. This striking perennial is commonly called the tree poppy; it reaches a height of about 5 ft., has grey-green leaves,



Rondeletia. The fragrant red flowers of *R. odorata*, an attractive greenhouse pot plant.

and bears large white poppy-like flowers in summer. There are two kinds, varying only slightly in appearance, Coulteri and trichocalyx. The most suitable position for these

plants is in a border at the foot of a sunny wall in loamy soil. In cold districts the stems are usually cut down by frost in winter, but if the roots are protected fresh shoots will develop in spring. These plants are increased by root cuttings placed in a box of sandy soil in a frame in spring.

ROMULEA. This is the name of a group of spring flowering bulbs with flowers somewhat resembling those of the crocus. They should be planted in autumn in sandy, loamy soil in a sunny sheltered position, or they may be grown in flower pots in the greenhouse. Some of the best sorts are bulbocodium, blue and yellow, Clusii, lavender, and speciosa lavender-rose.

RONDELETIA. This evergreen flowering shrub, suitable for the greenhouse, grows to about 5 ft. in height. Its fragrant flowers are borne in compact heads in the summer. Rondeletias flourish in a compost of loam with a little peat and sand added.

The temperature of the house should vary from 50° to 70° F., according to the season. Propagation is by cuttings struck in sand in the springtime. The favourite kind is speciosa or odorata, which has red flowers.

Roof. This measure of surface contains 40 square rods or 1,210 square yards. Four rods go to the acre. See Square Measure.

ROOFS OF MANY KINDS

Features of the Principal Types Used in Domestic Architecture

This article, after describing common methods of roofing, and the materials used, deals in detail with the construction of a typical roof. See Corrugated Iron; Cottage; Laves; Gutter; House; Key; Mansard; Parspet; Purling; Rafter; Slate; Thatchlog; Tile, etc.

Roofs are distinguished firstly by the materials used for covering them, and secondly by their form of construction. They may be covered with thatch, stone, tile, slate, lead, zinc, copper, iron, glass, bitumen, or asphalt, etc., and according to the kind of material so will the form and method of construction vary.

There are flat, lean-to, couple or span, hip, mansard, and M roofs. These are further divided into low or high pitched roofs, as their sides make greater or lesser angle with the horizon. In carpentry the roof is the timber framing by which the covering materials are supported; this in general consists of plates, principal rafters, common rafters, purlins, ridge boards, etc.

Flat roofs are covered with lead, zinc, or asphalt after being formed with the necessary wood construction, but roofs of ferro-concrete are common. Flat roofs are given a slight pitch or inclination in order to throw off water that may fall on them in the form of rain or snow. The pitch may be anything between 4° and 8°. The smallness of the pitch in the case of a lead covering is on account of the fact that lead will creep with the

varying influences of the temperature. For this reason the sizes of the pieces of lead are restricted to a maximum of 7 ft. by 2 ft. 6 in. It will be appreciated that the bigger the piece of lead used the more evident will be expansion and contraction. For similar reasons the sizes of zinc are restricted when used on a flat.

The formation of flat roofs varies according to their size. Plates and joists form the main structure, the size of the joists varying with that of the roof. To the joists are nailed, T, and G, boarding, which should be laid lengthways to the fall; the flat area is divided up into bays by the use of rolls and drips. For an asphalt covering the structure of the roof is similarly formed, or the base may be ferro-concrete.

Lean-to Roofs. Lean-to roofs have only one side or slope, the top part of which is generally fixed to the main wall of another building; they are commonly used for covering outhouses and sheds. The construction is very simple. A plate is fixed on to the main wall of the building that is to carry the top of the rafters, and another plate is fixed to the main wall of the shed or outhouse. Rafters are nailed to the two plates; an intervening purlin would be fixed if the common rafters were more than 10 ft. in length between the supports.

The pitch varies according to what kind of covering material is used. If the roof is tiled or thatched, 45° would be a suitable pitch, 30° for slate, and 10° to 20° for corrugated iron. If tiles, slates, or thatch are used the common rafters should not exceed 12 in. apart, but with corrugated iron they may be placed 2 ft. apart.

Span Roofs. Span or couple roofs have two sloping sides. They are composed of rafters that have their heads cut and fixed to a ridge board, and their feet to the wall plates at the base. The common rafters are arranged so as to project beyond the walls of the building at least 6 in. in order that any water falling from the roof will fall clear of walls. This kind of roof depends entirely upon the stability of the walls that carry it, because it has no tie beam to hold it in, hence if used for work of a permanent nature the span should not exceed 12 ft. If an addition to this kind of roof is made in the form of a tie beam it will take a



Roof. Typical example of a span roof.

wider span. 2 ft. may be added to that given in the former case, but the roof then becomes what is known as a closed span or couple roof. The span on a roof may be increased by placing a piece of timber across the ties as a binder. Ties and binder are spiked together, and a long bolt known as a king bolt connects the binder with the ridge board at intervals of 7 ft. to 8 ft. If the tie beams were not so supported they would sag towards the centre. These tie beams may be used as ceiling joists, but the clear span for such a roof should not exceed 20 ft.

If it is desired to take advantage of some of the space in a span roof the tie beams may be raised above the wall plates to a maximum height of half-way up the rafters, the ties in such a case are called collars, and the roof is termed a collar roof. This is not so strong a roof as the two preceding ones. In the ordinary couple roof much of the strain is placed upon the walls to which the plates are fixed. There is a tendency of the roof to spread, and the walls are thrust outward.

Most buildings require a roof with a span bigger than those mentioned, and additional timbers in the form of purlins and struts have to be introduced. In houses of moderate size intermediate supports are found in the form of partition walls, upon which the ceiling joists or tie beams rest, and from which struts are supported, while at the ends the purlin is built in the wall. In order to carry this type of purlin a collar is fixed to about every sixth pair of rafters. The collars are supported in turn by the struts that take their bearing from the supports beneath. This type of roof will take a span of 30 ft., and may be formed at 30° to 45° pitch.

With a roof of the span mentioned it is best to employ two purlins if it has a pitch of 45°, thus dividing the length of the rafters into three. The top purlin is fixed on the collars. The lower purlin is of a trussed design; that is, it has a top and bottom member, with intervening struts and ties in order to stiffen it up, and to prevent any sag.

Two span or couple roofs may be built side by side to cover one span, such roofs being called M roofs. A valley gutter, formed between the two roofs, is lined generally with lead, and arranged so as to fall towards both ends; that is, its highest bay is in the middle of the length of the roofs. A curb roof is one having the slope broken on two or all of its sides. In such instances the head of the rafters, where the slope changes, is cut and fixed to a heavy purlin or curb, these purlins being held together by tie beams or joists. In addition to the top purlin another is fixed midway between the head and the feet of the rafters which are attached to the wall plate. The curb roof may be finished in the form of a flat roof. As a means of lighting curb roofs, dormer windows are invariably introduced; when these roofs are used under suitable conditions they have a very pleasing effect, and they have the further important advantage of utilizing all the available space in the roof.

Roofs framed on to trusses form the best but the most expensive type of roof. The trusses most generally used are the king post and queen post truss. These are formed of fairly large timbers, and consist of a tie beam, principal rafter, struts, and a king post; the queen truss has two posts called queen posts. These frames or trusses are supported by the walls, and



Roof. Tiled gable end with edge tiles arranged on Winchester underhang system. Above, mansard type of roof

rest on the wall plates; the trusses support the purlins and the pole plates, which in turn carry the common rafters, the feet of the latter resting on the pole plates. A truss roof is better able to withstand heavy loads than any of the roofs mentioned. All its members are either in tension or compression, and with careful design it can be arranged so as to convey the load of the roof on the angular points of the truss.

The head of the king post is prepared to receive the ridge board; at the head of the truss there is a 3-way iron strap, and at the base there is also a strap of iron fitted with a gib and cotter. These straps both assist in producing a rigid structure. The purlins are arranged so as to rest on the principal rafter at the point of intersection of the strut, the pole plate is fixed on the end of the tie beam.

The queen post truss is intended for roofs with a wider span. The 3-way strap, bottom straps, gibs and cotters will be used in duplicate, seeing there are two posts. Between the posts a straining sill is placed at the base, and at the head a straining beam.

The joints used in framing the two kinds of trusses are common to both. The head of the principal rafter is secured to the king post by stub tenon and shoulder, in addition to the 3 way strap. The struts and the base of the king post are joined with a joint like that used at the head. The head of the struts is joined to the principal rafter by the use of a stub tenon immediately under the purlin. The bottom iron strap with the gib and cotter allow for the tightening up of the joints on the tie beam and base of the king post in the case of slight shrinkage or sag of the material.

A mansard or a French roof is formed by a combination of the king post and queen post trusses; the former is placed over the latter, a combination which allows much of the space in a roof to be usefully employed. This type of roof is used in connexion with business houses, but it is not a common feature in the construction of smaller dwelling houses.

Materials for Roofing. Roofing materials comprise slates, tiles, asbestos-cement tiles, galvanized iron, either corrugated or in flat sheets, lead, zinc, bituminous feltings and many branded roofing materials, flat stones, thatch, tarred felt, concrete, asphalt, timber, and glass. Of these slates and tiles are the most extensively used for domestic purposes. Bituminous felt and similar materials are most commonly employed for roofing quite small buildings.

Stone roofs are seldom met with except where the material is naturally abundant.



They are very heavy, and often prone to be damp. Concrete is much used for flat roofs, and when blended with a suitable water-proof composition and properly laid, it undoubtedly gives excellent results.

Thatch, carried out in straw, reeds, or heather, is held in dis-favour by fire insurance authorities, and is generally considered to



Roof. Pavilion roof, with four sides sloping to the ridge. Above valley roof on two semi-detached houses



harbour vermin and insects. A thatched house is warm in winter and cool in summer, so that thatch has much to commend it when it can be properly used. It is not practicable as a roofing material in any place where it is liable to be ignited by sparks or from any other cause.

Corrugated and other galvanized iron are not suitable for dwellings despite the fact that they are fairly lasting, fire-proof, vermin-proof, and impervious. Galvanized iron is hot in summer and cold in winter, and the noise made by rain falling upon it is against its domestic use. Nevertheless it is probably the cheapest practicable roof covering, and for outbuildings, poultry houses and the like is a highly satisfactory material, provided it is used in a reasonable manner with due regard to its limitations.

Construction of a Typical Roof. As an example of the construction of a roof of a small house, Figs. 1 to 7 show progressive stages of the work. The walls having been erected to plate height, that is, the height at which the brickwork terminates and the roof begins, a wooden tie, or plate, is laid horizontally upon the wall and bedded in mortar.

The next step is to prepare a number of rafters. These will generally measure about 4 in. deep and 2 in. broad, and will reach from approximately 12 in. beyond the face of the wall to the apex of the roof, that is, the junction with the ridge board. One end of the rafter is cut at an angle, so that it bears up against the ridge board, while the other end is notched to fit on to the opposite portion of the plate. Having prepared a number of rafters, the work of erecting the ridge commences, for which purpose it is convenient to lay the ceiling joists in place on the top of the wall plate (Fig. 1).

The joists are simply placed in position, being spaced at appropriate distances apart about 14 in. centres, and spiked to the plate to prevent them shifting. Two rafters are placed in position on the plate and against a ceiling joint, two or three rafters length from the end of the ridge. The upper ends of the rafters are pressed together so that they bear against the ridge board, which is placed in position between them. The feet of the rafters are spiked to the plate, and their upper ends to the ridge board, the other end of which it

meanwhile supported in any convenient manner. The same operation is gone through near the other end of the ridge, after having plumbd up the first pair of rafters by comparing with a plumb line suspended from the ridge to the ceiling joists. A cross strut is generally nailed temporarily between the rafters and the plate to keep them from shifting.

Another pair of rafters is added near the centre of the ridge, after having tested the latter to see that

it is not sagging or twisting when the rest of the rafters are set in position in pairs. One pair of rafters is set up against the inside edge of the brickwork, and if the barge board is to overhang the walls more than a few inches, an outside rafter is needed. The ridge board projects a few inches beyond the line of the barge board. Where the roof terminates against a chimney stack, the ridge board is supported on a brick corbel built out of the stack, or is carried on the end of a pair of rafters.

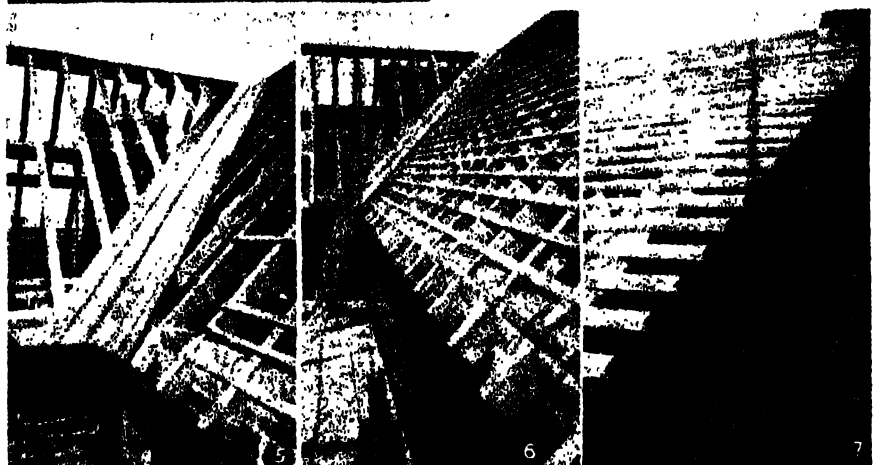
The junction of two such roofs results in the need of fitting a number of short rafters to a diagonally placed member known as a hip ridge board, when it is at an outside angle, and a valley board when it is an inside angle. These are fitted in much the same way as the other rafters, except that it is necessary to cut the ends to a different bevel, and to bevel the sides so that the board fits snugly into the angle between the two ridge boards. This stage is illustrated in Fig. 2. The triangular space between the ridge and the valley or hip board is then filled up with short or jack rafters, the ends of which are cut to a bevel in two planes, that is, the top and side of the rafter each shows a bevel. These are spiked in position similarly to the rest of the work.

Supporting the Rafters

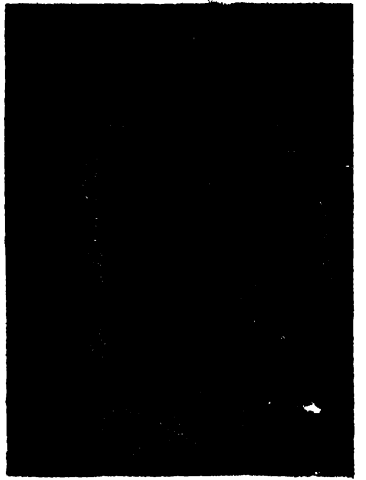
To support the rafters, long horizontal beams of considerable strength are provided, called purlins (Fig. 3). They are placed in position and provided with adequate means of support at each end, and also at intermediate stages. At the ends they are generally built into the brickwork of the gable and at the hip are jointed to the hip or valley boards, and further supported by collars or horizontal crosspieces of timber spiked to the rafters immediately beneath the purlins. Struts are then fitted to intervening wall supports, unless the partition walls are carried out in brick when they may be built in position. Braces, or diagonal timbers, running from the plate to the junction between the purlins and the gable ends are then spiked to the under side of the rafters, to take up the strain due to the pressure of the wind on the end of the house, and to prevent the roof from twisting.

An opening round the chimney stacks will have to be worked by means of a trimmer—that is, a piece of wood jointed into the nearest continuous rafters and to this trimmer the short rafters which have to terminate against the stack are fixed (Fig. 4). A bracket piece is fitted to them and some roof boarding whereon to set the flashing for the chimney stack.

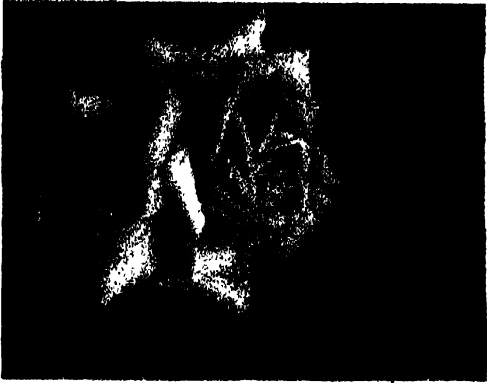
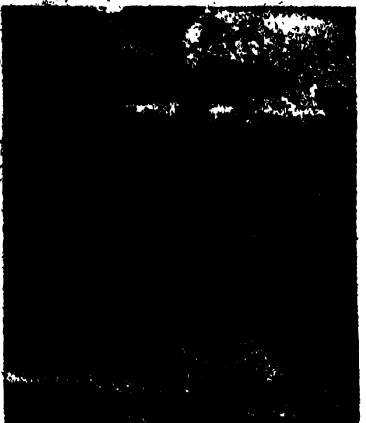
Valley boards (Fig. 5) are fitted to support the guttering material. These are simply



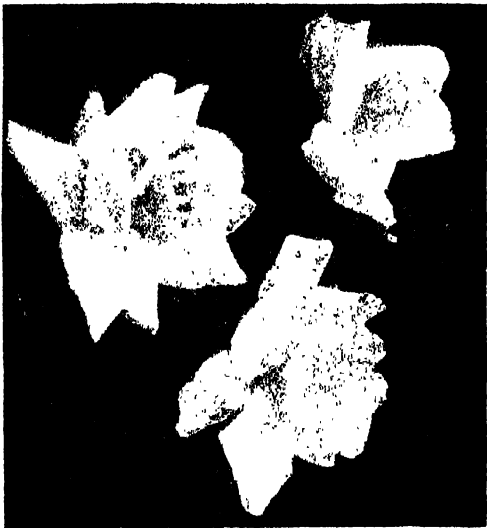
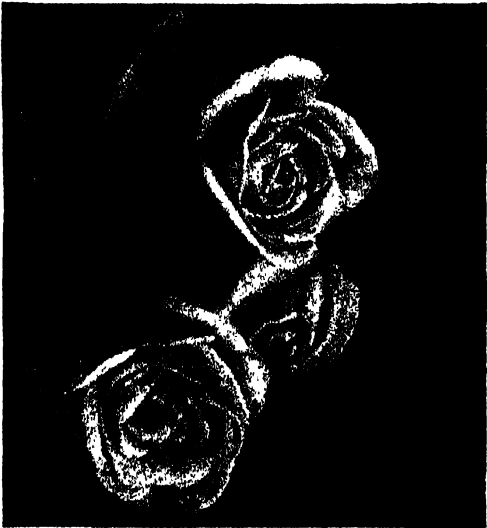
Roof stages in construction. Fig. 1. Showing how ends of rafters and ceiling joists fit to the plate. Fig. 2. Valley board and common rafters in place. Fig. 3. Purlins in place, also hip and valley and tie beams. Fig. 4. View from beneath showing how rafters are trimmed round a chimney stack. Fig. 5. Valley boards in place to support guttering. Fig. 6. Filling between the rafters to prevent ingress of wind. Fig. 7. Verge on gable end.



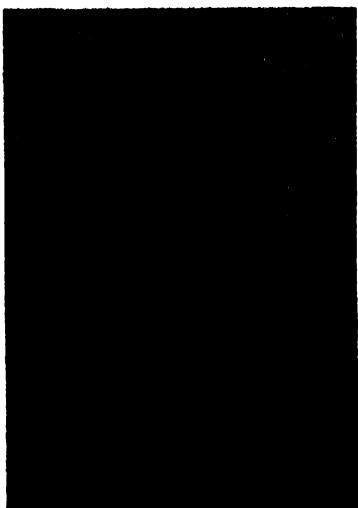
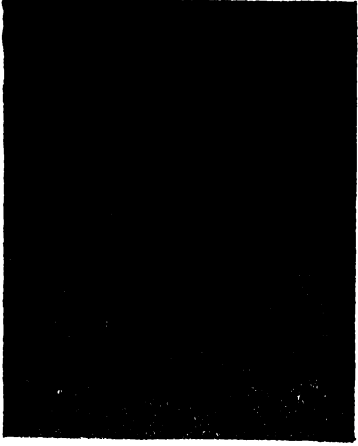
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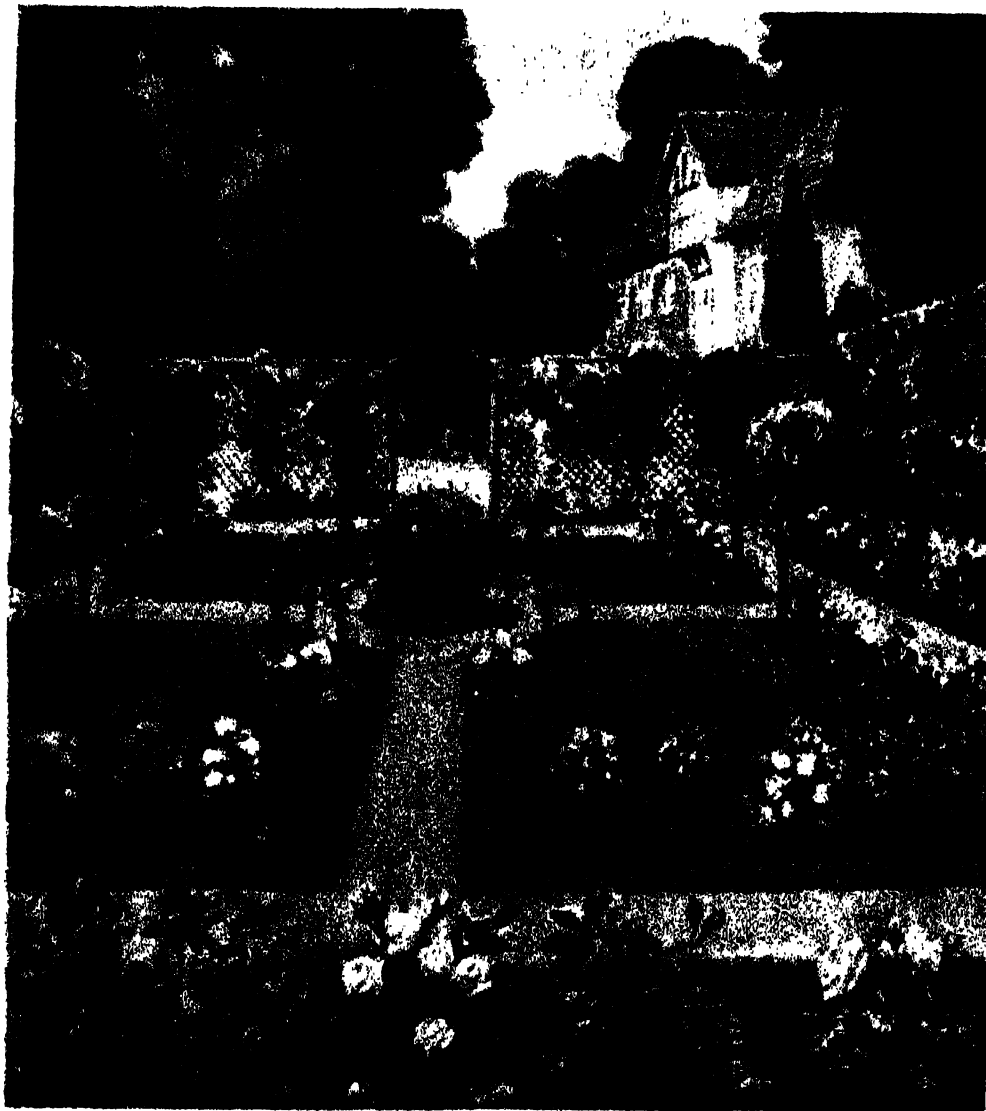


Mo. Victoria



Label





ROSE GARDEN

TWO SUGGESTIONS FOR EASY-TO-DO

Left: An arrangement within the scope of any middle suburban garden, the effect being produced by means of bushes covered with ruffled and double standards and bushes as an effect after a period of time, now a long one. Below a more elaborate design, with a path, patio and a large pond in the center. The clipped and well-manicured to this garden is a fine illustration of the planning and planning a rose garden can be done.

THE GARDEN OF THE FUTURE



rough boards nailed to the rafters and run from the eaves to the ridge in the angle between the two roofs. The eaves are formed by cutting the overhanging ends of the rafters in two different directions—one a vertical cut to provide a bearing surface for the fascia board and the other horizontally cut, to provide a support for the soffit board. These boards are spiked to the ends of the rafters and to each other. The near side of the soffit board, where it bears against the wall, may be supported by rough grounds to which it is nailed. The space between the rafters above the plate is filled in with brick, or any other material that will close up the aperture, to prevent the wind from driving underneath the rafters (Fig. 6).

At this stage the roof may be finished in several ways. The whole may be boarded with rough boards (or tongued and grooved boards in very good-class work), and the tile or slate battens set upon them. Or weatherboarding may be used set the wrong way up; that is, with the thick end uppermost, thus providing ledges whereon to lay the tiles. Otherwise, tile battens may be simply nailed to the rafters, and the boarding omitted. On the score of economy this can be recommended, but it is generally considered that boarding before tiling the roof makes it perfectly watertight, and gives a more equable temperature. In the case illustrated the rafters were simply battened for tiles. The battens terminate against the valley boards, or any other boards, such as those for the gutter. The next step is to lay the gutters, such as the valley and those around the chimney stack, and also to put up the flashing. After this process has been completed the roof may be either tiled or slated.

The verges, or overhanging ends, are finished in various ways, but the method in Fig. 7 results in a good appearance and is economical. A 9 in. board is cut to shape and set vertically against the ends of the purlins and plate, and the tile battens nailed to the top edge. A moulting is then run along the upper edge, the tiles laid flush with the edge of the moulting, and the joints pointed or filled in with cement mortar. The roof is completed by fixing the guttering. If stack pipes or any other projections such as lightning conductors or flagstuffs are to be fixed to the roof, the fitting of the framework or brackets for them is best effected before undertaking the tiling.

Sheds and Outhouses. A simple method of covering a boarded roof suitable for a small shed is by using bituminous felting material. The boards are generally set vertically—that is, they run from the plate to the ridge—and are supported by two or more purlins, according to the size of the roof. The roofing material, if similar to tarred felt, should be laid in a continuous strip from eaves to eaves, and should be nailed to the boards with regulation felt nails. The edges should overlap about 2 in. and be made watertight by the cement generally obtainable from the makers of the roofing material. The edges are then covered on the outside with laths of wood about 2 in. wide and $\frac{1}{2}$ in. thick, which should be bedded on the roofing cement and secured with stout wire nails.

A flat roof, as of an outhouse, can be laid in much the same way. In this case, it is of paramount importance that the joints between the strips of roofing material be rendered watertight with a liberal application of roofing cement. The seams should then be nailed with felt nails, spaced about 2 in. apart; but with this type of roof the difficulty is to render the side wall joints watertight. One way to do this is to employ efficient flashings, which is another is to turn up the edges of the roofing material so that, when finished, the whole is very much like a large, shallow

tray. A fall must be provided in two directions so that the rainwater can drain away to a down gutter, and thence to a rainwater head or other discharge pipe.

Repairing Leaky Roofs. The repair of leaky roofs, and the way in which these difficulties are overcome, depends upon the nature of the roof covering, and is dealt with under such headings as Damp; Gutter; Slate; and Tile.

There is a number of patent preparations sold for repairing roofs. An old slate roof can be made waterproof by using a plastic bituminous compound. This is applied to the bottom edge of loose slates, which are bedded

down to the underlying slates with a joint of the same compound. Cracks, holes, etc., are filled up, and the surface of the roof is treated with a liquid preparation of bitumen. Sheet metal roofs can be reconditioned in a similar manner, using both the plastic and liquid preparations.

In the case of a small roof covered with bituminous material, if this gets punctured through any cause, it can generally be dealt with by fixing a patch of similar material upon it and cementing down and nailing around the joint. Should it crack or split for any length, it would be best to cut out the affected section and provide a whole new piece.

ROOF GARDENS: PLANTING AND TREATMENT

How to Utilize Accessible Leads and House Tops

This article suggests ideas for transforming flat roof spaces into welcome open-air additions to the home. See also Arch; Garden Furniture; Loggia; Trellis; Veranda; Window Box, and the entries on the various plants and shrubs mentioned.

If a tiny garden or balcony loggia, with growing flowers, creepers and shrubs to give a fresh, country air, can be made on a drab lead, the recessed roof or the top of a town house, it will usually afford both interest and pleasure. Where window boxes are not allowed a small flat piece of roof can often be utilized for flowers without infringing regulations. An awning can be fixed at no great cost which can be raised or lowered at will, and such garden furniture provided as can be easily moved, adjusted and folded away when not in use. A grass mat is a pleasant addition when the surface of the roof is level, and adds to the gay appearance of the garden. Where there are children the double protection of a strong railing and a flower box should be constructed on the open end wall of the lead or roof. The railing should also be fenced so that it affords no foothold.

Trellis screens, as shown in Fig. 1, make a delightful background and also afford privacy. When possible walls—unless of an attractive brick—should be washed with some good colour, such as deep cream, pale leaf green, ochre, or lemon yellow. Simple wind-screens can be contrived of Japanese netting.

In Fig. 1 fuchsias, geraniums, violas, petunias, etc., are planted in boxes painted green, and hanging baskets are attached to the trellis.

In some of the newer houses architects have planned a terrace, balcony or roof garden, and such gardens are also to be found on the top of the more recently-built London flats. The discovery of the value of light in the prevention of various diseases is now fully recognized, and a terrace garden such as that shown in Fig. 2 is of immense value as a place where sun and air can be enjoyed. Such a roof space is formed by a set back upper storey.

The use of reinforced concrete for flat roofs makes the planning of a roof garden easier, as it is possible to plant hedges in troughs and to lay out formal gardens with clipped box and other shrubs. Rock gardens in miniature have also been successfully made high above the traffic of city streets. Quick growing vines provide a green background; garden ornaments can be added, and in some cases a playing fountain.

Fig. 3 illustrates a kitchen roof garden. Tomatoes do particularly well grown in boxes and runner beans are both practical and decorative. On a large roof space the amateur may plan both flower and vegetable gardens, dividing them by means of a vine-covered trellis. Marrows, cucumbers and mushrooms will grow together with minor crops of lettuce, radishes and mustard and cress. In addition parsley, mint and sage may be usefully cultivated.

For this more ambitious type of roof garden a tank for supplying water at air temperature with which the plants can be conveniently watered during dry weather, and a good-sized can for the purpose, will be found useful.

Cultural Details. General cultural details essential to the success of roof gardens are careful and regular watering during spring and summer; spraying of foliage in the evenings of hot days; forking-in of some good fertilizer once a fortnight during summer, and gentle pruning of trees and shrubs to keep their growths compact as they increase with age.

In the many cases where it is impracticable to lay down beds and borders, roof gardening is usually accomplished by means of pots, tubs, and boxes. Common butter-tubs are excellent for small plants, but larger specimens, such as trees and shrubs, are best accommodated in halved barrels or paraffin casks. The latter will require thorough cleansing, and a good method is to fill it with shavings and fire the interior until the oil is burnt out. All receptacles brought into use will require holes drilled to allow water to escape as well as thorough drainage crooking.

Soil must be of good heart and quality, owing to the difficulty of frequent change. Rich loam, leaf-mould, peat, decayed manure, coarse silver sand, and some good chemical fertilizer, will form excellent stock for compost. Each box or tub should be nearly filled, with sufficient space left for watering. Arrangement



Roof Garden, Fig. 1. Boxes of ivy-leaved geraniums and fuchsias, with wisteria, etc., on the trellis.



Roof Garden. Fig. 2. Roof garden on a country house. In the boxes antirrhinums and other plants are growing, while trellis work is provided for climbing shrubs
Courtesy of Our Homes and Gardens

is a matter of individual taste and structural convenience, a tub in each corner, with boxes between, being a common base for most roof-garden schemes. All receptacles should be given a coating of preservative.

Trees, Shrubs and Flowers. The roof gardener has at disposal a variety of trees, shrubs, climbing plants, perennials, annuals, bulbs, and alpine plants if the garden is suitably planned for the growth of the last named.

Among other shrubs that will thrive with care are the spindle tree, rhododendrons, spotted laurel, Jew's mallow, barberries, skimmia, privet, mock orange, flowering currants, and small standard bay trees. Single specimens of these need to be grown in tubs or boxes at least 18 in. wide and deep. There is scope for plants of climbing or semi-climbing habit, attached to chimney-stacks or poles, or trailed across trellis. Perennials that do well include Virginian creeper, Ampelopsis Vestchii, white and yellow jasmine, mountain Clematis, Clematis Jackmanni, and climbing roses. Amongst annual climbers which are of great use are canary creeper and nasturtium.

Annual flowers that are easily grown from seed sown in boxes are zoeletias, Clarkias, Candytuft, nasturtium, sweet peas, Alyssum, marigolds, Escholtzias, annual chrysanthemums, and Virginian stock. Tender annuals and biennials, such as stocks, zinnias, petunias, Phlox Drummondii, lobelias, geraniums, ageratum, fuchsias, and tobacco plants may be procured as seedlings.

Hardy perennials are not always successful on roofs, but early flowering chrysanthemums, Solanum's seal, irises, creeping Jenny, carnations, polyanthus, London pride, periwinkles and sweet williams, will do fairly well. All the above must have plenty of water, preferably early in the morning and after sunfall. Bulbs, including tulips, may be grown, but the crocus has a special attraction for town sparrows, and is not recommended.

Pour over them a breakfastcupful of good stock well flavoured with vegetables, and spread over them 8 oz. of butter and clarified beef dripping mixed.

Make a paste of flour and water, and with this cover the dish. Bake the rooks for about 2½ hours, then take them up, remove the flour-and-water paste, and let them cool. When cold, arrange over them a lid of rough puff pastry as for pigeon pie; glaze, ornament, and bake for about ¼ hour or until the paste is thoroughly cooked.

A modern method is the following: Prepare the birds as in the first recipe, cutting each in half and removing the backbone, then stew them gently in stock for 1½ hours. Slice 1 lb. rump steak into strips and roll up each one, then cut 4 oz. lean ham into dice. Season the rolls of steak and lay them at the bottom of a pie-dish, then arrange the rooks on the top of them interspersed with the dice of ham. Season the birds and strain over them the stock in which they were stewed. Cover with a good puff or rough puff pastry as for meat pie, and bake from 1½ to 1¾ hours. See Pastry.

ROOT: Of Plants. A plant draws the nourishment that it requires from the soil through its roots, tiny points at the end of the root acting as suckers and always turning in the direction from which most nourishment is to be obtained. In all roots the fibrous parts are annual, decaying in winter and coming to life again in the following spring.

Roots are diversified in structure, as, for example, the elongated tap roots of parsnip and carrot, the globe-like form of turnip and swede, the deep and spreading roots of lily, the cord-like roots of the fan palm, the fibrous roots of the melon, etc. Some plants develop roots in water, like duckweed, whilst others, such as mistletoe and certain orchids, are parasitic and attach themselves to the trunks of other plants.

Roots act also as supports for the tree, plant, or shrub. Excessive root development is inimical to seed production, and vice versa. Thus fruit trees often bear poor crops owing to root luxuriance, but again produce fine crops after root-pruning. On the contrary, frequent transplanting of young green

ROOK PIE. Only young birds should be used to make a rook pie. The following is an old country recipe: Take 6 to 8 young rooks, draw and skin them carefully, and immerse them in cold water for 2 or 3 hours. Then split them and remove the backbones. Wash them carefully, changing the water twice, and dust each bird with a seasoning of salt and pepper, then pack them closely in a pie-dish



Fig. 3. A kitchen garden on the house's roof. Tomatoes are grown in boxes at the back, runner beans at the side, and a marrow in the tub in the centre
Courtesy of Our Homes and Gardens

crops develops many fibrous roots, which in turn prevent the early running to seed of mature plants.

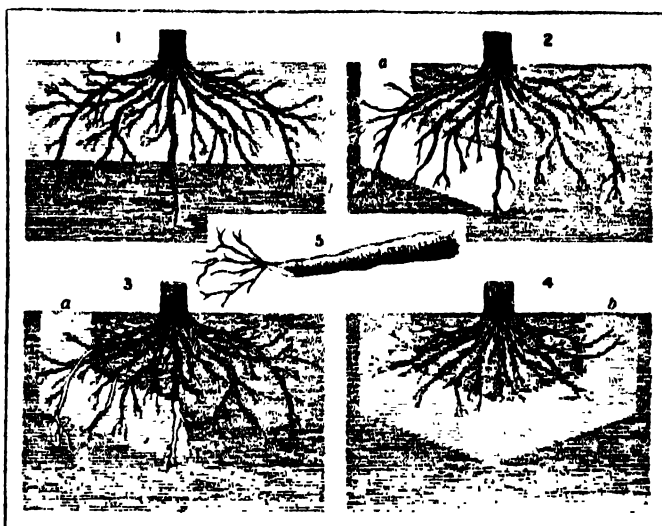
There are certain plants which are most easily propagated by cuttings actually taken from the root. Such plants include the horseradish, bouvardia, seakale, oriental poppy, Japanese anemone, anchusa and burning bush.

Root Pruning

This practice is carried out by gardeners chiefly for the purpose of restricting the growth of vigorous unfruitful apple, pear and plum trees and of encouraging the development of fruiting spurs. The method is to dig a trench at 3 to 4 ft. from the trunk of the tree in autumn after the leaves have changed colour and to fork away the soil from beneath the tree until the roots are exposed, these are then shortened by half or even two-thirds and fresh loamy soil is placed among them and pressed firmly.

The result of this treatment is to check the growth of the trees severely for the next year or two. A better plan is to lift the young trees annually in autumn during two or three years following planting, shorten long thick roots and replant immediately. This will probably prevent the need for severe root pruning in later years. If it becomes necessary to root-prune old established trees the roots on one side should be pruned one year and those on the other side the following year. See Division: Propagation: Pruning.

ROPE. Although this name is often given to cord over $\frac{1}{2}$ in. diameter, rope is properly cordage over 1 in. diameter. It is made with threads of hemp and other fibre, such as flax,



Root Pruning. 1. Root growth requiring pruning; 2, top soil; 3, subsoil; 4, Trench (a) dug half way round; 5, Roots pruned, as shown by unshaded portions and trench refilled with good soil. 6, Second season's pruning, circle completed and trench refilled (b). 7, How to prune roots.

twisted together with the aid of a wheel used by rope-makers. For domestic purposes rope is used for lifts and lifting apparatus, such as blocks and tackle, and for various other purposes. It is liable to deterioration through damp, and for outdoor use it should therefore be protected from rain.

Generally rope wears out through becoming frayed, therefore all rope used for lifting purposes should be examined frequently, and all sharp corners liable to come into contact with the rope should be rounded off or otherwise protected. New hoisting rope should be oiled soon after it is put to work, using the best sweet oil. The process should be repeated at least once a month for the first six months, and to preserve the rope to an almost indefinite period all that is necessary is an occasional rub with an oily rag. See Guy Rope.

ROQUEFORT: The Cheese. This cheese is made at Roquefort in France from ewes' milk with a mixture of goats' milk, and the curd is broken very small. When ripening, it is exposed to strong currents of air.

ROSES: VARIETIES OLD AND NEW

How to Obtain the Best Results in Garden Display and for Cutting

The amateur gardener may consult Flower Garden, Pergola, as well as such entries as Disbudding, Pruning. Attention is also drawn to the Colour Plates facing p. 1068, 1069.

The rose is the loveliest of all garden flowers, it is now represented by hundreds of varieties, of which many have been raised within recent years. The new ones are far superior to the old ones for garden display and for cutting for decorative purposes indoors, they bloom freely not only in summer but, in autumn too, and a collection of the up-to-date varieties must be considered indispensable by every garden lover. It is often said that the new roses are less fragrant than the old ones, but that is not wholly true, for many of the latest novelties have sweet-scented blooms. A garden planted with a representative selection of the best roses is almost as gay in September as in June and July; the plants continue to make fresh growth during the summer and early autumn months and almost every shoot is crowned with blossom.

Roses may conveniently be grouped into five main classes—ramblers, climbing roses, dwarf or bush roses, standards, and shrub roses. The modern types and varieties in each of these classes are immensely superior to those seen in the gardens a generation ago and they ought chiefly to be planted.

Rambler Roses. There are two chief types of rambler roses—the wichuraiana and the multiflora. The varieties of the wichuraiana type are more popular, for they are vigorous and easily managed, many of them have handsome lustre leaves and all bear a profusion of blossom in high summer. The following is a selection of the best—Alberic Barbier, pale yellow; Aviateur Bleriot, yellow; American Pillar, rose and white; Chatillon Rambler, pale pink; Dr Van Fleet, blush; Dorothy Perkins, rose pink; Emily Gray, yellow; Excelsa, crimson; Francis Juranville, salmon yellow; Gaudema, cream; Hiawatha, crimson; Lady Gay, rose pink; Frauchet, pale salmon; Minnehaha, deep rose; Sander's White, and Thelma, salmon pink.

Their management is simple. They ought to be planted in autumn or in early spring in deeply dug and well manured soil, and in March all the stems or branches should be cut down to within six inches of the ground. This treatment will force the development of fresh strong shoots from the base which will bloom well in the following year. In subsequent years pruning should be done as soon as

the flowers have faded by cutting out the old stems which have flowered and tying the new shoots to the support.

The multiflora type of rambler is less commonly known than formerly. It is being superseded by those of the wichuraiana type. Favourite varieties are Blush Rambler, with apple blossom like clusters of bloom; Crimson Rambler, bright red; Tea Rambler salmon and copper; Mrs. F. W. Flight, rose and white; Pemberton's White Rambler; Tausendschon, rose pink; and Violotta, lavender violet. These need the same treatment as given for wichuraiana rambler roses.

A few of the old rambler roses are still planted. Among them are Felicite Perpetue and Amée Vibert, white; Rêve d'Or, yellow; very rampant, and the yellow banksian rose which must be planted against a sunny wall and left unpruned until it is well established, and then needs to be thinned out.

Climbing Roses. The true climbing roses are less rampant than the rambler roses, though still vigorous enough to cover poles, pillars and arches, they are suitable also for walls. There are two types of these, those which are naturally of climbing growth and others called "sports," which have developed accidentally from dwarf roses and are distinguished by the prefix Climbing, e.g. Climbing Ophelia.

Of the former, some of the best are Allen Chandler, red; Gloire de Dijon, salmon buff; Lady Waterlow, carmine-salmon; Lemon Pillar, pale yellow; Madame Alfred Carrière, almost white; Scarlet Climber; Souvenir de Claudius Denoyel, red; Wm. Allen Richardson, orange and yellow; and Zephyrine Drouhin, the thornless rose, rose pink.

Of the climbing "sports," the following are favourite roses—Climbing Caroline Testout, pale rose; Climbing Independence Day, yellow; Climbing Lady Hillingdon, orange yellow; Climbing Madame Hermot, orange salmon; Climbing Ophelia, blush; Climbing Sunburst, yellow.

The way to prune roses in the first group, which are naturally climbers, is to cut out parts of the old branches in late summer or early autumn to make room for new shoots. Special care is needed in pruning the climbing "sports." They should not be cut down in the spring following planting as is advisable with the other climbing and rambling roses; merely the tips of the branches are cut off.

Bush Roses. The dwarf or bush rose is perhaps the most important type of all; it reaches a height of from 18 in. to 2 or 3 ft., according to the variety, and if suitable sorts are chosen will apply blooms from June until November. If the weather is mild the trees may be planted between then and the middle, or even the end, of March. Those planted early will be most satisfactory the first year.

Success depends very largely on correct preparation of the ground. This ought to be dug not less than two spits, about 20 in. deep. Farmyard and stable manure or hop manure must be mixed freely with the lower spit, and basic slag, 4 oz. per square yard, should be scattered on the soil when digging is finished, and forked beneath the surface. The rose bed or border ought to be prepared a week or two in advance of planting. Before the trees are put in the branches should be shortened by half. In exceptionally cold or exposed gardens it is wise to protect the bases of trees by heaps of old ashes or soil, but in most places they do not need this protection.

Pruning the Trees. This important task should be carried out early in April. All newly-planted trees, i.e. those put in between the previous October and March, must be pruned severely. Thin weakly shoots should be cut out and the three, four or five remaining branches must be shortened to within five or six buds of the base of the previous year's

growth. This treatment will force the trees to send up fresh vigorous shoots which will bloom in summer.

In subsequent years the spring pruning must not be so severe unless it is wished to obtain blooms for exhibition. Weakly shoots must be cut right out and the remaining branches shortened by about half or two-thirds, according to whether they are vigorous or only moderately vigorous.

The summer pruning is just as important as the spring pruning. If the blooms are out for home decoration they should be removed with long stems; if the roses are left to fade on the trees the shoots which produced them should be cut to within three or four buds of the base. As a result of this treatment fresh strong shoots will grow that will bear blooms later on. It is an excellent plan to cut back all shoots in this way as soon as the blooms have faded, there will then be a succession of new shoots which in due course will bear flowers.

Best Garden Roses. The following is a list of excellent bush or dwarf rose trees which will furnish a good display in the garden and provide flowers for cutting. Angels Maten, rose, flushed orange. Betty Upchurch, carmine

growth, and after the first year they should be pruned lightly. Varieties include A. Hill Gray, lemon yellow; Anna Olivier, pale rose and buff; G. Nabouand, pale rose. Lady Hillingdon, yellow. Lady Roberts, apricot and copper; Maman Cochet, rose. Marie Van Houtte, pale yellow and rose. Madame Antoine Marie, rose and white; Molly Sharman Crawford, white. Mrs. Foley Hobbs, white tinged pink. Mrs. Herbert Stevens, white; Muriel Wilson, palest lemon; White Maman Cochet and W. R. Smith, blush white. For garden decoration the tea roses are less commonly grown than formerly, as the hybrid teas have superseded them.

Pernetiana Roses. The Pernetiana roses, named after M. Pernet, a French grower who originated this type, are remarkable for their intense and brilliant colouring. The first yellow roses were pernetiana varieties. Very few of the true old pernetiana roses are now grown; they have been cross-bred with the hybrid teas and as a result a new race with the vigour of the latter and the rich colouring of the pernetianas has been raised. Among the best of this type are these: Angle Pernet, orange-yellow. Cecil, rich yellow single

Madame E. Herriot, deep salmon. Dazla, orange scarlet; Golden Emblem, yellow; Gwyneth Jones, orange carmine; Hortulana Budde, red; Independence Day, yellow; I Zingari, orange and scarlet; Lady Roundway, copper yellow; Mrs. G. A. Van Rossem, orange apricot; Ruth, carmine and orange-salmon; and Souvenir de Claudius Pernet, yellow. The flowers of many of these varieties are "thin," that is, they have few petals. The trees seem more susceptible than others to the attacks of black spot, the worst disease of roses. They need the same treatment as the hybrid teas; the shoots are rather liable to die back in winter, therefore at the spring pruning the damaged parts must be cut off.

The hybrid perpetual roses form one of the oldest groups in cultivation. They are distinguished by vigorous growth, large well-formed double blooms chiefly of one colour, but they do not flower so freely in late summer and autumn as the hybrid tea roses.

Favourite varieties are: Alfred Colomb, red; Captain Hayward, red; Charles Lefebvre, crimson. Duke of Edinburgh, red; Fisher Holmes, crimson; Hugh Dickson, red (vigorous, makes a large bush); Mrs. John Laing, pink. Ulrich Brunner, rose; and Victor Hugo, crimson.

In spring, thin weakly shoots must be cut out, and the main branches of the past summer's growth cut back by about two-thirds.

The dwarf polyantha or baby rambler roses are very popular for filling formal flower beds, for they bloom more or less all through the summer and early autumn. In spring they may be hard pruned to keep them dwarf, or pruned lightly if it is wished to have bushes two feet or more high. A few of the best are Betty Prior, carmine; Else Poulsen, pink; Fairy Cluster, blush-pink; Fortschritt, salmon-yellow; Heidekind, pink; Karen Poulsen, scarlet; Mrs. Finch, pink; Poulsen's Pink.

Certain beautiful roses of vigorous growth soon develop into bushes from 2-4 feet or more high; they are not suitable for planting among



and salmon. Caroline Testout, pale rose. Clarice Goodacre, white. Emma Wright, salmon-orange. Etoile de Hollande, crimson. General McArthur, red. Golden Gleam, yellow. Julien Potin, yellow. Lady Alice Stanoy, rose. Lady Pirrie, salmon and copper. Lieutenant Chauré, red. Crimson Glory, crimson. Mabe Morse, yellow. Madame Abe Chatenav, carmine rose. Madame Butterfly, deep blush. McGredy's Yellow. Mrs. Henry Morse, bright rose. Mrs. S. McGredy, salmon-apricot shades. Mrs. Wemyss-Quinn, yellow. Ophelia, blush. Picture, deep blush. Rev. F. Page-Roberts, yellow; and Shot Silk, cerise and salmon. All these belong to the class called hybrid teas. They grow and flower freely and are strongly to be recommended to amateur gardeners. The other types of rose which are grown as bushes or dwarfs are the tea, hybrid perpetual, pernetiana and dwarf polyantha or baby rambler.

The tea roses thrive best on well drained soil: they are ideal for planting in a sunny border at the foot of a house wall. Most of them are of rather twiggy spreading



Rose: four beautiful varieties. 1. Hugh Dickson, in colour midway between crimson and scarlet. 2. Mrs. Bryce Allen, a rose of great fragrance, with rose-pink petals. 3. Clarice Goodacre, a vigorous, free-flowering rose which bears ivory-white blooms. 4. Betty Upchurch, an excellent variety that bears blossoms ranging in colour from delicate salmon-pink to glowing coppery carmine, suffused with orange.

the ordinary dwarf or bush roses, but look well in beds on the lawn, or they may be set in a sunny shrubbery. If planted in deeply dug and manured soil and pruned in late summer by cutting out old branches or parts of them they will soon become established. Some of the best are the modern hybrid musk roses, which bear bunches of bloom throughout the summer and early autumn months: *Clytemnestra*, salmon-rose; *Felicia*, rose pink with yellow flush; *Pax*, white; and *Penelope*, salmon-pink.

Others are *Hugonis*, single, yellow, early flowering; *Moyesii*, deep rose-red flowers and handsome fruits; and *rubrifolia*, grown for the sake of its reddish shoots, which are most useful for cutting for decorative purposes. The Japanese *Briars* (varieties of *Rosa rugosa*) form large bushes and bear single and double flowers, the fruits of the single flowered varieties are handsome in autumn, the showiest variety is *Conrad F. Meyer*, a very vigorous shrub with thorny branches and bearing large double fragrant rose-pink blooms in May and June.

The old fashioned roses, e.g. the *moes*, *Provence*, *York* and *LANCASTER*, are little grown nowadays, probably because they bloom only in summer. They should be planted in a sunny place in well tilled and manured soil; pruning, which is done late in March, consists of cutting out all thin weakly shoots and shortening the main branches of the previous year's growth by about half.

Standard Roses. Standard rose trees need similar treatment to the bush and dwarf roses of the same name. In planting care must be taken to keep the uppermost roots within 2 or 3 in. of the surface of the ground. The stems of standard roses are briars, and all shoots which grow on them should be cut off. They ought to be staked securely at planting time to prevent damage in windy weather. The stems of standards are 3-4 ft. high, those of half standards 2-2½ ft. high.

Some of the best roses to grow as standards are *Betty Upchurch*, *Caroline Testout*, *Clarice Goodacre*, *Emma Wright*, *Ethel Somerset*, *Frau Karl Druschki*, *Golden Gleam*, *Hugh Dickson*, *Independence Day*, *Lady Hillingdon*, *Lady Pirrie*, *M. D. Hamill*, *Madame Butterfly*, *Etoile de Hollande*, *Mrs. H. Bowles*, *Mrs. Wemyss Quin*, *Ophelia*, *Shot Silk*, and *Mrs. Sam McGredy*.

The tea roses do well as half standards, but many other varieties can also be obtained in this type of tree. A few suitable sorts are *Christine*, *Emma Wright*, *General McArthur*, *Lady Pirrie*, *Los Angeles*, *Lord Chattermont*, *Madame Butterfly*, *Miss C. E. Van Rossem*, *Mrs. H. Morse*, and *Rev. F. Page Roberts*.

Fragrant Roses.

The following varieties of roses, which may be grown as dwarfs or standards, have sweet-scented flowers: *Angole Peruet*, orange yellow; *Avoca*, crimson; *Bedford*, crimson; *Cherry*, yellow and rose; *Clarice Goodacre*, white; *Cornelia*, rose; *Dame Edith Helen*, pink; *Daily Mail*, scented, rose, crimson; *Ethel Somerset*, pink; *Etoile de Hollande*, crimson; *Felicia*, pale rose and yellow; *General*

McArthur, red; *George Dickson*, crimson; *Golden Gleam*, yellow; *Gustav Grunerwald*, carmine rose; *Hadley*, crimson; *Hoober Beauty*, crimson; *Hugh Dickson*, red; *Ivy May*, blush with deeper shading; *Juben Potin*, yellow; *Lady Alice Stanley*, rose; *Lady Helen Maglona*, dark red; *Lady Pirrie*, salmon; *Lady Worthington Evans*, crimson; *Laurent Carle*, carmine; *Lieut. Chauré*, red; *Mabel Morse*, yellow; *Miss C. E. Van Rossem*, crimson; *Madame Abel Chatenay*, salmon rose; *Madame Butterfly*, blush; *Mrs. Bryce Allen*, rose pink; *Mrs. G. A. Van Rossem*, apricot; *Mrs. John Laing*, pink; *Ophelia*, blush; *Penelope*, salmon rose; *Shot Silk*, cerise salmon; *The General*, red; *Victor Hugo*, crimson; *Clarih Brunner*, rose red; *Viscountess Folkestone*, blush.

The best artificial manure for rose beds is known as *Tonks's manure*. It can be purchased from horticultural sundriesmen, and should be applied in March at the rate of 2 oz. per square yard of ground. Regular attention to such details as hoeing, weeding and cutting out weak useless growths helps to ensure success in rose growing. Suckers, i.e. shoots from the briar stock on which the named variety of rose was budded, must be uprooted as soon as they are seen; they can generally be distinguished by their prickly stems and light green leaves composed of seven leaflets.

Diseases of Rose Trees. The worst disease is black spot. This is a most serious trouble, the leaves are disfigured by dark blotches, and in a bad attack they fall, sometimes to such an extent that the trees become leafless in summer. All diseased leaves should be gathered and burnt, and in winter sulphur should be scattered freely on the soil and on the rose tree. Further precautions are to spray with Bordeaux mixture or with liver of sulphur (one oz. in two gallons of water) occasionally in spring and early summer. All shoots cut off in pruning ought to be burnt.

Mildew is another common disease of rose trees, it is recognized by the presence of greyish mould-like patches on leaves and stems, and is most prevalent in late summer, especially in continued wet weather. Sulphur is the best antidote, and measures similar to those recommended for destroying black spot should be practised.

Insect and Other Pests. Rose trees are subject to the attacks of numerous pests. The commonest is aphid or greenfly, which can be destroyed by spraying with one of the advertised insecticides, or with paraffin

emulsion, which is made by dissolving a handful of soft soap in a little hot water, adding two gallons of warm water and an eggcupful of paraffin. Various caterpillars attack the leaves, and the rose maggot often damages the flower buds; these pests should be searched for and destroyed. Rolled leaves ought always to be examined.

The attacks of the rose leaf hopper cause white blotches on the leaves, especially of rose trees on walls; red spider and thrips, two minute pests, are chiefly troublesome on roses under glass and on walls—they attack the lower leaf surface. The frog-hopper or cuckoo spit infests the young shoots, the rose slugworm eats away the tissue of the leaves, and the leaf-rolling sawfly rolls up the leaves until they become mere strips.

A nicotine insecticide, sold by horticultural sundriesmen, is the best wash to use against most of these pests. The leaf-cutting bee, which cuts semicircular pieces from the leaves and uses them in its nest, is difficult to deal with, it should be watched, and if possible traced to its nest so that the latter can be destroyed.

Roses in Pots. Pot roses grown under glass should be lifted from the ground in October, placed in 6 in. pots in a loamy compost, and placed in a cold greenhouse. No artificial heat whatever should be given the first season. After flowering, which will be scanty in result, plunge the pots out of doors in ashes during the summer months, re-pot in early autumn, prune in

November, and then remove to a heated greenhouse. All indoor roses should be stood out of doors, after flowering, in the summer. Climbing roses grown under glass should be planted in a well-drained border of loamy soil.



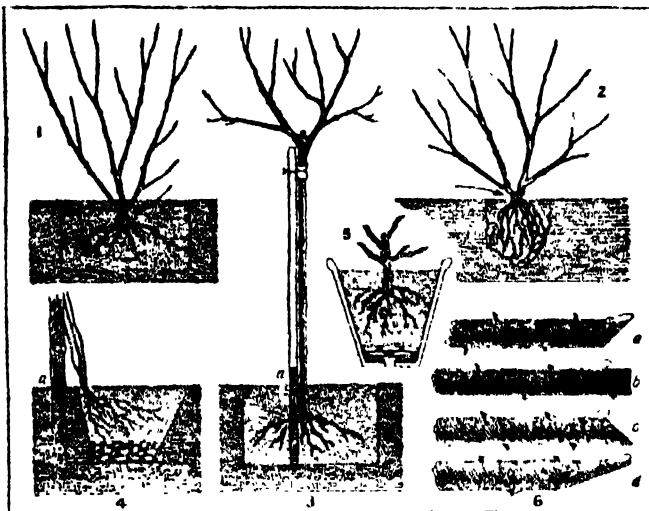
Rose Bay. Dwarf form of *Epilobium* with rose purple flowers

ROSE BAY. The name of rose bay is applied to *Nerium oleander* and *Epilobium angustifolium*. The former, which is described under *Oleander*, is a greenhouse evergreen flowering shrub. The latter, a hardy perennial herb of the evening primrose order, sometimes called the French willow herb, produces willow-like foliage with crimson flowers. It grows to a height of 4 ft., and flourishes by the waterside or in ordinary soil. The illustration shows a dwarf species of *Epilobium* known as *obcordatum*. See *Oleander*.

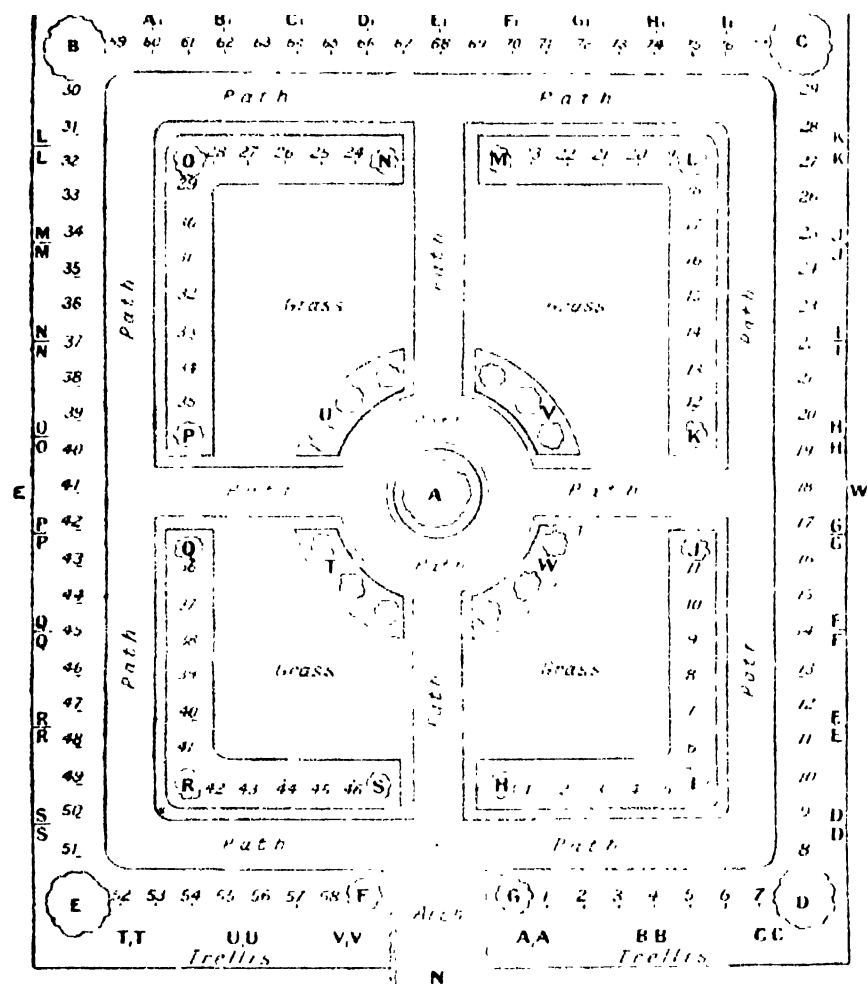
ROSE CAKE. Rose cakes are small vanilla flavoured cakes, so called because of their colour. They can be made by creaming together 3 oz. margarine and 3 heaped tablespoonfuls sugar, then adding by degrees 2 or 3 eggs and 3 oz. flour, beating the mixture well as each egg is added. Then mix in 3 heaped tablespoonfuls of cornflour, a little vanilla flavouring, and a few drops of pink colouring. Bake the mixture in small greased tins in a moderately hot oven for about ½ hour.

ROSE CAMPION. Sometimes called rose of heaven, this is one of the showy border plants known as *Lychnis*, or *campion*. It grows about 18 in., and produces rosy flowers in summer. See *Campion*; *Lychnis*.

ROSE GARDEN. The ideal aspect for a rose garden is south or south-east, and all beds and borders will repay thorough trenching



Roses: the best ways to plant them. 1. Correct planting of dwarf bush. 2. Standard, staked and planted; a, tarred end. 3. Planting a climber; a, tarred end. 4. Dwarf, potted and pruned. 5. Pruning cuts: a right; b, c and d, wrong.



Rose Garden. Plan of an effective rosery laid out in a small garden. A-E, weeping or pillar roses. F-H, standard roses: T-W, half-standards: numerals, bushes: double letters and A, L, climbing roses.

before planting. The design shown in the diagram is easily adaptable to larger or smaller spaces, and, if planted with good varieties, will provide an attractive rosery. Its length and width respectively are 40 by 31 ft. The round centre bed has a diameter of 4 ft., whilst those placed in the grass panels are 2 ft. wide. Paths uniformly have a breadth of 2 ft., except under the entrance arch, where 2 ft. extra is allowed. South, east, and west borders are 3 ft. wide, and the north border 4 ft.

Pillar or weeping standards are planned A, B, C, D, and E. F to K are ordinary standards.

Beds T, U, V, and W are devoted to half-standards.

The outside panel beds, numbered 1 to 46, and the side borders numbered 8 to 51, are entirely planted with bush or dwarf roses.

The top borders, facing south, and numbered 1-7, 52-58, accommodate tea-scented roses.

Hybrid perpetuals are placed from 59 to 77; the first 12 being fragrant reds and the other 7 whites and pinks.

Behind these against the south fence, A to H, a delightful background consists of Penzance briars.

Suitable climbers for the trellis and remaining fences are arranged at AA-CC and TT-VV. Varieties should be chosen from the selections given in the article on Rose on the previous page. See Pergola; Trellis, etc.

ROSE MALLOW. The shrub *Hibiscus*, or Syrian Mallow, is known as rose mallow.

It is tardy, grows 5 ft. or more high, and bears single or double flowers of various colours in late summer. See *Hibiscus*; *Lavatera*.

ROSEMARY. This favourite shrub, which grows from 3 ft. to 5 ft. high, has fragrant leaves, and bears pale mauve flowers in spring. It thrives best in well-drained soil, and must have a sunny place; a border at the foot of a house wall suits it well. Its botanical name is *rosmarinus officinalis*. Regular pruning is unnecessary, but straggling shoots should be cut back as soon as the flowers are over. Propagation is by cuttings in boxes of sandy soil placed in a frame in August.

British grown rosemary yields essential oil in the proportion of 24 oz. to 1 cwt. of leaves. This oil, which is distilled from rosemary leaves, is much used by manufacturers of scented soaps and perfumes like eau-de-Cologne.

Medicinal Uses. In medicine the essential oil of rosemary acts as a carminative and stimulant, and is a useful remedy for flatulences. The dose is 1 to 3 minims on a piece of sugar. The oil or the spirit is often included in hair lotions. Insects do not like it, and it may be used to keep them away.

Rose of Jericho. This is another name for the resurrection plant (q.v.).

ROSE OF SHARON. This is the popular name of a low-growing evergreen plant which bears large single yellow flowers in summer (*Hypericum calycinum*). It will thrive beneath trees, and if cut down each spring provides attractive greenery.

ROSETTE MULLEIN. This beautiful rock garden plant (*ramonda*) has large wrinkled leaves and bears bunches of purplish flowers in early summer. It must be planted in a crevice facing north or east, the rosette of leaves flat against the rock; a compost of loam, peat, and sand is suitable. *Ramondia pyrenaica*, pale violet-purple and *Nathalia* purple, are the two best kinds.

ROSEWATER. As its name implies, this is a water manufactured from rose petals. It is made from what remains after the distillation of otto or attar of roses, and has to be diluted with twice its volume of water before use. It is used in toilet preparations and is also mixed with glycerine and applied to relieve chaps, etc. Occasionally, rosewater is employed as a flavouring agent in cookery. See Otto of Roses.

ROSEWOOD. This is a fancy hardwood of a rich dark colour, red or brown, with wavy streaks that are almost black. Formerly it was much used for pianos and cabinets, and as a veneer on plainer woods. To day it is used to a slight extent for pianos and also for handles to carving tools and to the squares and levels used by woodworkers. It takes a good polish, but, as it is rather oily, glue is unable to get a good hold on it. One reason for its decline in popularity is that it has a tendency, even when well polished, to develop minute cracks in the pores of the wood.

The finest rosewood is the Brazilian variety. In character this is of a heavy, dense nature, rather coarse and open in the grain. Indian rosewood, known also as blackwood, has the same general characteristics as the Brazilian. See Wood.

Rosin. This is an alternative name for resin (q.v.).

ROSIN PLANT. Bearing two other names, Sulphur and compass plant, this is a hardy herbaceous perennial belonging to the daisy order, bearing yellow flowers in summer. It is most suitable for a wild garden, and best grown in bold groups, requiring little or no attention, and ordinary soil.

ROTATION: Of Garden Crops. This may be termed a scientific method of cultivation, based on the principle that, although plants extract the same foods from the soil, there is a marked difference in the amount used by any given kind.

As the requirements of all plants differ in regard to potash, nitrogen, and phosphates, any undue depletion of one or another has to be prevented by rotation in order to maintain an adequate fertility.

Under systematic rotation, crops of the same family should not succeed each other, whilst those with long perpendicular roots that feed at some depth should always



Rosemary. Sprays of the fragrant evergreen shrub, from the leaves of which oil is distilled for medicinal and other uses.

be followed by shallow feeders extracting nourishment only from the upper layer of soil.

A simple method of rotative cultivation is to divide land for vegetables into 3 plots of equal size, recording them as 1, 2, and 3, and cropping each on a three years' turn-about system in the following manner:

Plot 1. First year. Beet; carrots; parsnips; potatoes. Second year. Celery, beans, leeks; lettuce, onions; peas; spinach; turnips. Third year. Brussels sprouts; broccoli; cabbage; cauliflower; kale; savoy.

Plot 2. First year. Celery, beans, leeks; lettuce, onions; peas; spinach; turnips. Second year. Brussels sprouts; broccoli; cabbage; cauliflower; kale; savoy. Third year. Beet; carrots; parsnips; potatoes.

Plot 3. First year. Brussels sprouts; broccoli; cabbage; cauliflower; kale; savoy. Second year. Beet; carrots; parsnips; potatoes. Third year. Celery, beans, leeks; lettuce; onions; peas; spinach; turnips.

ROUGE: The Make-up. No cosmetic requires such careful and individual choice by its users as rouge. The exact shade which enhances the particular type of face and colouring of hair and eyes, the right amount for use by day or artificial light, and the correct placing on the cheeks should all be considered by anyone who wishes to improve her appearance by the application of rouge. Another important point which is frequently overlooked is the harmony of lipstick and rouge. It is not uncommon to see an orange shade of the latter and a rose shade of the former applied at the same time, with unfortunate facial results.

Rouge is obtainable in liquid, powder and cream form. Powder rouge is the most convenient and should be applied as follows: first, powder foundation; second, powder all over the face; third, rouge; fourth, a light dusting of powder all over the face, dusted on with a complexion brush or clean puff.

The edge of the rouge must be unperceptibly blended into the complexion, so that no beginnings or endings are visible. If you want to make your face look thinner, apply a dark shade of rouge up to the highest point of the cheek bone, blending it carefully into a lighter shade on the lower part of the cheek.

To make your face look fatter make a large circle of rouge over the whole cheek.

If you have hollow cheeks, you should use a darker shade of rouge on the upper part of the cheek and a lighter one on the lower but keep to a circle as the general outline.

A very light application of rouge taken up well under the eyes will disguise dark rings, but this must be worked in carefully with your usual rouge on the cheek.

The nearest shade to the natural colour is the right one in all cases.

Older women if they use a brilliant rouge may look hard and unnatural. If very pale a delicate shade of coral or rose should be faintly suggested. Dry rouge is the best for occasional evening use, as it is easier to apply the exact amount required by this means when rouging is not part of the daily facial make-up. See Beauty; Make-up.

ROUGH CAST: For Walls. The surface treatment for walls known as rough cast consists in coating the face of the wall with mortar and, while it is still wet, throwing fine washed gravel or other hard material on to it. The surface becomes broken up and more or less filled with the small pieces. Rough casting is often used in lightly built houses for improving the weather-resisting qualities of the walls, and also for its decorative value.

In some buildings the whole of the work may be rough cast, but in others only the upper storeys or particular parts. In any case, the general treatment is the same. First the mortar, which should preferably be made with Portland cement, is prepared and the whole of the wall surface rendered with it. A supply of clean, washed gravel, finely broken stone, or similar hard material should be prepared. It is then picked up on a trowel,

thrown against the wall surface of the cement, and allowed to set hard. The surface is often finished by washing it with cement wash. Lime mortar can be used, but it has not the weather-resisting qualities of the Portland cement mortar. The properties of the latter in this respect may be further increased by using one of the weatherproofing preparations.

Rough cast as a structural material is easily and quickly applied to framed buildings, such as are built up of a timber framework and covered with expanded metal lathing. In such cases the lathing is first covered with a sufficient thickness of the mortar. This may consist of coarse stuff applied in one or two coats, according to the nature of the work. The rough cast may consist of stone and grit or washed gravel, mixed with hot lime and thrown on with a trowel.

The rough cast may be made up in buckets and should be applied to the walls in a semi-liquid state. The surface should be finished by immediately washing it with lime mixed with a little ochre to act as a colouring material. In many forms of timber and half-timber construction the rough cast is applied to a timber lathing, and the first coat is made of lime mortar well mixed with hair. The second coat is also of lime mortar, and the rough cast is applied to this. See Cement; Mortar; Plaster; Rendering.

ROUGH PUFF PASTRY. Although it is not quite equal to the real puff pastry, this is more economical, and can be made to serve many of the purposes for which puff pastry is necessary. See Pastry.

ROULETTE: The Game. Although large sums are staked on roulette, the game can be played with counters. For this purpose a table fitted with a wheel, or a wheel alone can be bought, these being reproductions or modifications of the one used at Monte Carlo. The main principles are as follows: although variations can be and are introduced.

The wheel is sunk into a cavity, either in the table or elsewhere. The base is on ball bearings, and it is made to revolve very rapidly by turning with the hand a small crossbar that rises from its axis. Round the wheel is a circular board divided into numbered compartments, and on one or other of these the players stake. As the machine moves, a ball is thrown into it, and when it comes to rest the winning number is indicated by the rotating ball.

The numbers on the board are arranged as follows: 0, 32, 15, 19, 4, 21, 2, 25, 17, 34, 6, 27, 13, 36, 11, 30, 8, 23, 10, 5, 24, 16, 33, 1, 20, 14, 31, 9, 22, 18, 29, 7, 28, 12, 35, 3, 26. Zero is coloured green; the others are white and red alternately. In the full game there is a

lay-out at each end of the table, and this is marked out into various divisions for the stakes. Down the centre of each are 12 rows of 3 squares each; these contain the figures 1 to 36, and at the top is a square for 0. On each side of these squares are spaces representing passe, manque, pair, impair, black, and red, and at the bottom are spaces marked out P 12, M 12, and D 12. The stakes may be laid on any of these squares.

Stakes can be placed on any single number, or on two, three, four, or six numbers, and on various other combina-

tions. Stakes are placed on P 12, M 12, and D 12 which refer to premier, milieu, and dernier, and on the numbers 1 to 12, 13 to 24, and 25 to 36 respectively. On rouge, or red, the stake is that the winning number will be red, and on noir, or black, that it will be black. Impair means that it will be an odd number, and pair that it will be an even one. Manque means that the number will be from 1 to 18, and passe that it will be from 19 to 36. Players can stake on zero as a single number. The odds against any single number are paid at the rate of 35 to 1.

ROUP: A Poultry Disease. One of the most contagious diseases known to poultry breeders is roup. There are several forms of the disease.

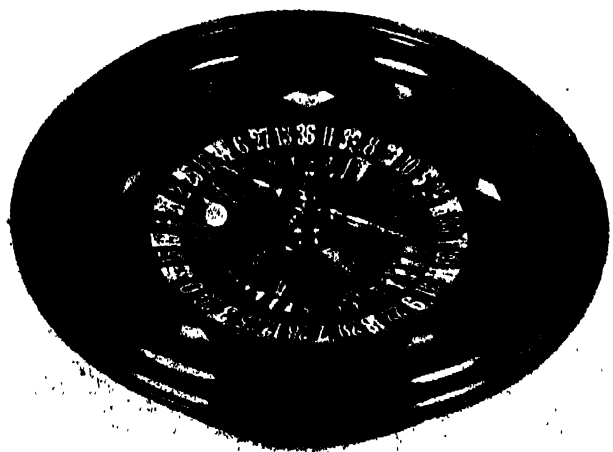
Diphtheric roup may be known from the swollen head and face, and the yellowish and whitish patches or ulcers. In nasal roup there is a yellow discharge from the nostrils. When the yellowish and whitish patches are seen in the mouth and throat, it is styled Avian roup. Another form causes the eyes to swell and exude matter, and the numerous membranes carry cheesy deposits. Roup in any form calls for complete isolation of all affected birds and of any that have been in contact with affected stock. If the birds are kept together, the disease will rapidly spread, with serious consequences to the poultry keeper.

Remedies. In mild cases permanganate of potash will effect a cure. Crystals are mixed with the drinking water sufficient to make it a rosy pink, say as much as will cover a sixpence to 2 gallons of water.

Another remedy is sulphate of copper. One ounce of the sulphate should be dissolved in 8 oz. of water, and given in the proportion of 1 oz. to each gallon of water. The face and head should be bathed with warm water, in which some disinfectant has been sprinkled, and the mouth and throat painted with carbolic glycerin. In bad cases the birds should be given warm food only.

Carbolic powder should be well sprinkled about the houses, runs, and pens, and all houses and runs thoroughly cleaned and disinfected after the attack has passed. They should not be used again for several months. See Poultry.

ROUT CAKE. The rich, sweet cake or biscuit mixture known as rout cake is made up into small fancy shapes and served with tea or light refreshments. To make it, sift 1 lb. fine flour and mix with $\frac{1}{2}$ lb. picked and clean currants. Put these in a warm place. Now beat to a cream $\frac{1}{2}$ lb. butter or margarine, add the same quantity of castor sugar, and beat again till very light. Keep the basin just warm, and use a wooden spoon to beat with.



Roulette wheel for home players. It is sunk in a circular wooden surround, the latter being divided into compartments, each bearing a number from 0 to 36 on either a red or a black ground.

Add alternately the flour and 3 eggs, which should have been beaten.

Mix these ingredients in by degrees and very lightly, pour in a little at a time 1 teaspoonful each of rose and orange flower-water, and 1 tablespoonful of maida or brandy. Dust a baking tin with sugar and flour, and drop the mixture, which should be rather stiff in texture, on to it in little heaps. These should be even. Bake them in a hot oven. The cakes will cook in a few minutes, and should each be about the size of a two-shilling piece.

Router cakes are sometimes made up as light spongy biscuits and baked in tins, or they are moulded on wooden blocks. The mixture for these cakes is rather different from the first recipe. Rub 4 oz. margarine into 1 lb. flour, add 1 dessertspoonful grated lemon rind, and $8\frac{1}{2}$ oz. castor sugar; make up the paste with 2 eggs well beaten, and 1 very small teaspoonful carbonate of ammonia dissolved in a little milk. Bake the cakes in greased and floured fancy tins, in a sharp oven.

ROUTER: The Plane. The router is used for inlay work or for finishing the bottoms of recesses. A typical pattern is made of malleable iron, not unlike a spokeshave in appearance. It comprises a working face through which a cutter projects, the amount of projection governing the depth of the recess. The carver's router has a hardwood block through which the iron, or cutter, projects, and is fixed in position by means of a hard wood wedge. Various widths of cutter may be used. The tool is a combination of chisel and plane. It is worked forward and backward and in various directions until a flat surface has been obtained on the bottom of the recess.

A modification of the router is used for cutting reeds and mouldings in positions remote from the edge of the timber, or for similar purposes in curved work. Some routers are provided with adjustable fences so that grooves may be cut in the work parallel to the edge. See Plane.

ROWAN. This familiar ornamental tree, which is known also as the mountain ash, is, botanically, a crab (*Pyrus aucuparia*) and its red fruits, which are very showy in autumn, are useful for making into jelly. It grows 20-30 feet high and flourishes even in poor soil, is an excellent tree for town gardens and for planting in streets.

Rowan Jelly. This is served with game and venison. To make it, the berries are first carefully washed, then placed in a preserving pan with enough water to cover them, and allowed to boil until soft. This takes $\frac{1}{2}$ hour or longer, according to the quantity. The berries are then transferred to a jelly bag, and crushed slightly before straining.

When all the juice has been extracted and has been thoroughly strained through the jelly bag into a basin or other dish, it is poured into the preserving pan, and sugar is added in the proportion of 1 lb. to each pint of juice. The liquid is then put on to boil and left until it jellies, which can be tested in the usual way by pouring a little into a saucer. The jelly is then poured into jars and sealed up. It should not be used for some time, as rowan jelly improves with keeping, and may be stored away for two years. See Jelly.

ROYAL FERN. This is one of the most handsome of hardy ferns and is especially suitable for planting by the waterside, though



Royal Fern. *Osmunda palustris*, an evergreen species of royal fern grown as a pot plant

it will thrive elsewhere in deep soil that does not dry out in hot weather. It belongs to the group of so-called flowering ferns, for the spores are on separate shoots, not, as is usual, on the backs of the fronds. The royal fern (*Osmunda regalis*) grows wild in some parts of Great Britain and in moist soil reaches a height of 3-4 feet.

ROYAL ICING. To make this icing use 2 lb. icing sugar, 4 whites of eggs, and the juice of 2 lemons. Rub the icing sugar through a hair sieve into a basin, make a well in the centre, and put in the slightly beaten white of egg. Mix in a little sugar from the sides, add half the strained lemon juice, and mix the whole to a rather moist paste, adding more lemon juice as required. If the lemons are large, all the juice may not be needed. Use the icing at once, smoothing it over with a large knife, dipping the latter in cold water occasionally. See Cake; Icing.

RUBBER: Its Domestic Uses. Rubber has many practical applications in the home in the form of mats and floor coverings, gloves, waterproofs, footwear and toys; also countless uses for accessories in kitchen equipment, for games, the car and the garden, etc.

One of the most important furnishings is rubber floor covering, the outstanding advantage of which is its durability. It will last from 10 to 30 years, according to its thickness and the amount of wear it receives; being of self colour, or inlaid, it does not show wear. It can be had in a variety of plain colours, also in marbled designs, so that colour schemes can be maintained, and by using borders of the same material in different shades various effects can be obtained. The marbled patterns are much more serviceable as they do not show footmarks so readily as the plain colours.

Laying the Rubber Floor. The material is made 3 ft. and 4 ft. wide by $\frac{1}{4}$ in. thick, but it can also be had in narrower widths for borders, and $\frac{1}{8}$ in. thick if desired. It can be laid direct on concrete, and in the case of a new building this is a great advantage as it saves the cost of floorboarding. The concrete must be thoroughly dry, otherwise the rubber, being impervious to water, would hold any damp and cause

the covering to sweat underneath, eventually becoming loose and uneven. It is exceedingly comfortable to walk on, quite silent, and, being a non-conductor, does not allow cold to pass.

If laid on a stone floor any unevenness will quickly show through, as the rubber, being pliable, fills the joints underneath and beds into every crevice; it is advisable, therefore, to see that the floor is levelled up before laying the covering. Where large areas are covered and long lengths of the material used, the flooring need not be fastened down; it will lie flat by its own weight, providing it is not displaced by moving heavy articles over it.

To stick the covering to a wooden floor certain varieties of glue or cement can be used; this is advisable in doorways or where small pieces are used to fill up corners. Special cements are used for sticking rubber floor covering to concrete.

The following is the method. Put a coating of the cement on both the underside of the floor covering and on the concrete, using a brush about 3 in. wide, allow both coats practically to dry before putting the covering down. It is better to cement the whole of the covering rather than the edges only, as in the latter case the material may bulge in the centre. Trim with a sharp knife, dipping the knife in water to make it cut easily.

There is no difficulty in cleaning rubber floor covering, but it is necessary to scrub with cleaning powder, in addition to the use of ordinary soap and hot water, and wipe thoroughly dry. Petrol or ammonia must not be used, as these tend to soften the rubber, and milk or oily substances are also injurious.

Rubber Tiled Flooring. Rubber inlaid tiling is a more expensive type of floor covering, but very good designs are made, and more elaborate patterns can be obtained than in the sheet form of rubber covering. The inlaid tiling is made to suit the area to be covered, and laid by men who specialize in this class of work, for this reason a plan or accurate measurements of the floor is necessary. For the house, $\frac{3}{16}$ in. thick will be quite serviceable, and this is the thinnest made. The design being made to suit the shape and size of the floor allows for great scope in this direction, such as the use of panel designs, black and white tiling effects, or plain art shades. It makes an excellent floor covering for the entrance hall, having the advantages of variety of design, durability and silence. It should be washed in the same way as ordinary rubber covering, but need not be polished, as the surface is good and readily cleaned.

Such floorings also have a beautiful effect for a dining room (see page 359). Nearly 100 colours and shades are available, enabling many designs and colour schemes to be effected. These floorings are non-absorbent and hygienic. They are therefore also most suitable for the nursery or bathroom.

Rubber stair treads can be of inlaid tiling. They are generally made the exact measurement of the stairs and fitted with a rubber nosing to come over the edges. Risers can be fitted to give continuity of design, and very pleasing effects can be obtained, particularly in marbled designs, if these are related to the larger designs used for hall and landings.

Stair treads can also be made with corrugated or pyramid rubber matting, $\frac{1}{4}$ in. or $\frac{3}{8}$ in. thick, and separate nosing can be supplied to suit. The rubber mattings can be tacked on to wooden stairs or cemented on to stone stairs, although in the latter case it is advisable to plug the stairs and screw the treads down.

Rubber Mats. For the bathroom there are marbled rubber mats, rubber tiling mats, sponge rubber mats, and diamond or corrugated patterns. It is advisable to have such mats with a roughened surface to prevent slipping, a smooth surface of rubber becoming very slippery when wet. One rubber mat that



Router Plane. Wood carver's router, with wooden stock the cutting iron being secured by a wedge

Courtesy of R. Melhuish, Ltd.

can be placed in the bottom of the bath is fitted with suckers on the underside which keeps it in place; this mat allows a person to recline comfortably.

Rubber door mats can be made in practically any size or shape to fit into a well or doorway. The general thickness is $\frac{3}{4}$ in., and they are perforated in various patterns, and can be had lettered, or with monograms inlaid in a contrasting colour. The perforated rubber door mats are very seldom worn out; they are generally broken by misuse and made unsightly. Care should therefore be taken not to fold or double the mat when it has been removed; it should be laid flat, or rolled. It can be scrubbed in the usual way.

There are rubber mats made for use in the kitchen sink; these usually fit on the extension piece of a porcelain sink, and have a grooved or roughened surface to prevent the dishes from slipping whilst draining. Other mats are protective rubber table mats, usually made in coloured marbled designs. Being thin and non-slipping, they are useful under linen embroidered mats to prevent marks from hot plates and dishes on the polished surface of the table.

Rubber Gloves. Thin rubber gloves protect the hands when doing housework. They should be one or two sizes larger than ordinary gloves, and the hands should be dry when the gloves are put on, or rubbed with French chalk to allow the gloves to slip on easily. If these gloves get torn or perforated they can be patched in the same way as a cycle tube, care being taken that the place to be patched is clean and dry before applying the solution. The small cycle patches with tapered edges are the most serviceable, because they are not likely to turn up at the edge.

New Uses for Rubber. One of the uses to which rubber is now being put is for upholstering furniture. For this either pneumatic or sponge rubber is used. Rubber is also used for brushes, buckets, and other household utensils. In the kitchen and scullery, the sink can be lined with rubber and the tables covered with it. Flowers made of rubber are sold for household decoration. Other articles made from it include bulb bowls, napkin rings, knife handles, and hand-bags for ladies.

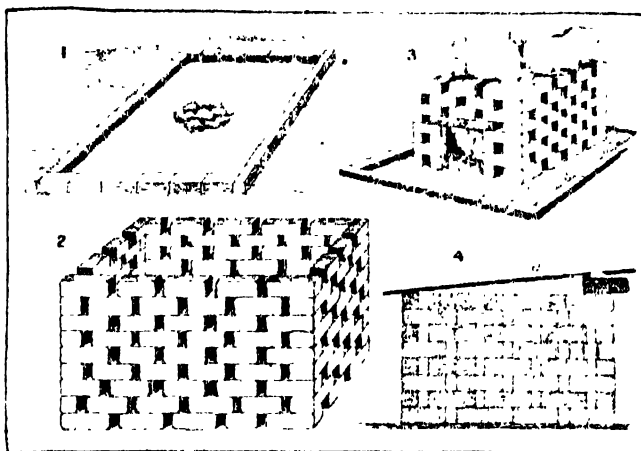
Rubber Solution. The name is given to a substance mainly consisting of rubber dissolved in benzol or naphtha. The composition varies with different makers. It is used for cementing rubber, particularly in connexion with the repairing of cycle or motor car tires and tubes. See Floor; Goloshes; Hose Pipe; Hot Water Bottle; Motor Car, etc.

RUBBER PLANT. The true rubber plant, *Hevea brasiliensis*, is the one from which the rubber of commerce is collected. In Great Britain it can be grown under hot-house conditions, but it has little attraction for foliage purposes.

The name is sometimes applied to the semi-hardy evergreen plant *Ficus elastica*, which is usually grown as a specimen in ornamental pots for room decoration. The plants flourish in ordinary potting mixture and are stood on tables and in windows free from draughts. See India-rubber Plant.

RUBBISH: In the Garden. Accumulated rubbish in the garden is a common eyesore, especially in plots of modest dimensions. Its disposal is not a difficult task, however, if dealt with in a systematic manner, and heaps of refuse can easily be utilised to advantage.

There are two methods of disposal—burning, and deep burial. Every garden of modest size might be planned with facilities for the disposal of waste. In one corner a fair-sized hole should be dug, and therein can be thrown



Rubbish. Showing how to dispose of garden refuse by means of burning. 1. Ground base for furnace. 2. Method of building body. 3. Incinerator in operation. 4. Method of sheltering with iron or zinc cover.

every bit of decayable vegetable matter from household and garden; indeed, this might well be augmented with sweepings from flue and chimney, and scrapings from the fowl-house, all being made fairly firm, and sprinkled with lime.

Early in the year the whole mass should be turned out and sprinkled with lime. In such manner rubbish is converted into a natural manure of much value, particularly when trenched in for deep-rooting crops.

Everything that will not easily decay, such as hardwood, tree prunings, and cabbage stalks, together with weeds like dandelion and dock, should be burned, the ash being stored in a dry place for use in spring.

A Brick Destructor. The burning of hard rubbish is best accomplished by means of a destructor built of bricks as shown. The lid keeps refuse in a dry state, and allows accumulation until time is convenient for burning. Autumn leaves should be collected and placed in a large heap, covered with wire netting, and left in the open until decayed.

All straight sticks from tree prunings, with the exception of soft ones, should be kept for staking. See Compost Heap; Incinerator.

RUBBLE: For Masonry. The term rubble refers to pieces of stone of irregular size and shape, and is applicable to practically any kind of stone. Small and irregular pieces of brick, known as brick rubble, are used in the formation of concrete for the foundations of buildings. Rubble walls are constructed of irregular-shaped stones. See Crazy Paving; Path; Stone.

RUBUS. This is the botanical name of an important group of shrubs which includes the raspberry, loganberry, and blackberry, and others of purely ornamental value. Of those with handsome flowers the best are *Rubus deliciosus*, with large white single flowers, and *odoratus*, with purple blooms.

RUBY. The value of the ruby is determined by its colouring, which varies in different specimens from a pale rose tint to dark red. The latter, known as masculine rubies, are the more valuable, some of the finest being more costly than diamonds of the same size. In hardness, the ruby equals the sapphire.

RUCHING: In Needlework. The trimming known as ruching consists of a strip of material, with a gathering thread run down the middle, from end to end, and sewn along the gathering to the article it is to trim. Ruchings, or ruches, as they are often termed, may be also pleated or boxpleated.

The strips of material for gathered ruchings are nearly always cut on the cross of the grain, so that their edges can be pulled out

with the fingers into flutes, to emphasise the frill. Strips for pleated or box-pleated ruches are cut on the straight.

Ruchings can be of any width, ranging from very narrow to very wide. The length the strips should be cut depends upon the nature of the ruche. For a gathered ruche, a strip measuring half as long again as it is when finished should be allowed. That is, if a strip of gathered ruching about 20 in. long is wanted, a strip of 30 in. must be allowed.

For pleated or boxpleated designs, strips three times the length are required.

When joining cross-way strips to gain the length required for gathered ruchings, make the joins on the straight of the grain, which means they will run slantwise across from edge to edge.

The edges of ruchings may be hemmed, bound with narrow strips of material, pointed, stitched, or rolled. A finish for the edges of ruchings made of taffetas is a fringe, this being done by fraying out the edges with a pin. Another finish is pinking.

To make a gathered ruche, cut and join the strips wanted, and neaten the edges; then fold it up into halves, quarters, and further subdivisions, if possible, and mark each fold with a



Ruching. Gathered taffeta ruche, the edge being frayed with a pin.

pin or chalk line. Fold the article it is to trim into an exactly similar number of sections, and mark to match. Next, run a gathering down the middle of the strip, draw it up slightly and pin it to the article so that the marks correspond, thus making certain of the fullness being distributed evenly; then run the ruche to the article along the middle.

To make pleated or boxpleated ruchings, cut, join, and neaten the strips; then set them in pleats, running a tacking along top and bottom edges as they are formed, and well press them afterwards. Run a cotton through the middle, to keep the pleats permanently in position, and sew them to the pelmet, cushion cover, garment, etc. See Bag; Pleating.

RUCKSACK. Bag for containing food and clothing, and worn on the back by some walkers and climbers. It differs from a knapsack (*q.v.*) in having a number of outer pockets, and in being fitted to a frame, the lower part of which fits the wearer's back and is strapped round the waist. It is further secured to the wearer by two straps, one from each of the lower corners of the rucksack, these passing over the shoulders and meeting in the centre of the top of the rucksack.

RUE: The Herb. This herb is of some decorative value in the garden; it grows 3 or 4 ft. high, has greenish-blue leaves, and yellow flowers in summer, and flourishes in ordinary soil in a sunny border. Propagation is by seeds sown in spring.

RUGS: ORIENTAL AND OTHER MAKES

How to Make Wool and Rag Rugs at Home

In connexion with this article on floor rugs see also Canvas, Carpet, Colour; Hail; Kirman Rug; Mat, Nursery; Persian Carpet, Turkey Carpet, Weaving, Wool. Information about Travelling Rugs is given under that heading.

With the increase in number not only of smaller rooms, but also of parquet and wood block floors, and the use of rubber and composition paved and tiled floorings, rugs are in greater demand than ever. There are also the hygienic and labour-saving merits of rugs to be considered, which make them suitable for nursery and bedroom use in place of the all-over carpet, which cannot be easily removed from the floor for cleaning.

Rugs may be roughly divided into six classes. Oriental rugs: those named after Axminster,

in pattern, and of luxuriant pile. Bokhara rugs include the styles called Turcoman, Afghan and Samarkand. The patterns are based upon roses turned into octagons, with hooked diamonds and other geometrical motives woven all over. Similar borders are in soft, brownish-reds with blue and greens. The wide webbing at the sides should on no account be sacrificed. Modern pieces are exported coloured with aniline dyes and of inferior designs.

Chinese rugs are beautiful, and in many Persian rugs there is a prevalence of Chinese

Garden carpets and rugs have designs of gardens with walks, trees and flower-beds. Such patterns were made as far back as the 6th century in Persia.

Other rugs come from Turkey. The demand for them is a large and growing one, and the industry that meets it has its headquarters at Istanbul and Smyrna. Imitation Turkish rugs are produced in British and continental factories, but in these lighter shades predominate, and, though they are excellent reproductions of what are known as fancy Turkish rugs, they are not truly Oriental in character, as they lack the typical eastern colouring. They are designed chiefly for staircase and corridor use.

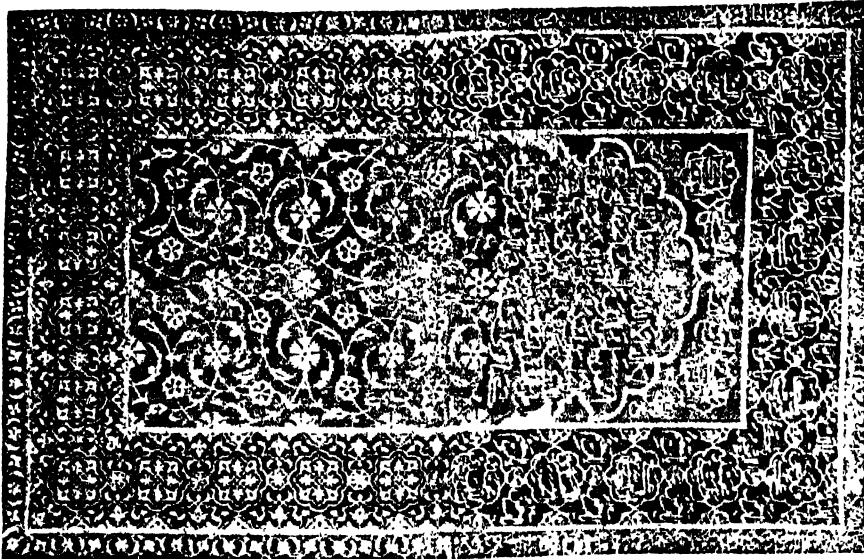
The best eastern rugs fetch high prices, and their colour and texture last through many lifetimes. Good modern examples can, however, be bought at moderate prices, which are woven by hand, the colouring of the better kinds being beautiful owing to the dyeing processes still in use for this class of work.

Among the most interesting Oriental rugs are those known as prayer rugs, made primarily for the devotion of Mahomedans. They usually comprise a niche, the point of which is directed towards Mecca, and beneath it is supposed to be placed a morsel of dried earth from Mecca, upon which the worshipper rests the forehead when he is at prayer. Ritual objects may be portrayed near the niche, and from the point there sometimes hangs a lamp or a floral pendant. The shape of the niche is a guide to the make of the rug.

There are at least thirty types of niche, those from Persia being usually curved, and all others woven in straight lines. Caucasian and Turcoman are always, and Persian usually, recognizable by having the field filled with ornamental motives, while Turkish have plain fields, as the more conservative Mahomedans obey the Koran, which forbids them to copy figures. These rugs seldom exceed 6 ft. by 4 ft.

The Persian prayer rug illustrated has borders filled with 15th century conventional floral patterns and inscriptions of the profession of the Islamic creed. The field has the curved and pointed niche with scrolling stems, flower motives and inscriptions. The rug is lined with silk and gold tissue dating from the same period.

English Rugs. Another class of rugs is manufactured in England by the Axminster, Wilton, and other carpet weaving processes. These differ little except in size from carpet squares, and are frequently made to match these, being useful for filling odd pieces of floor-space in a carpeted room. Mohair rugs in black and self colours, though uninteresting are very durable. Tufted wool



Rug. Persian prayer rug, crimson and green velvet, embroidered in silver thread. The field has a niche with scrolling stems and inscriptions. From the Mashhad Shrine

Wilton and other western carpet manufacturing centres; skin rugs; hand-woven rugs in geometrical and other modern designs; rugs worked with wool on canvas, rag rugs.

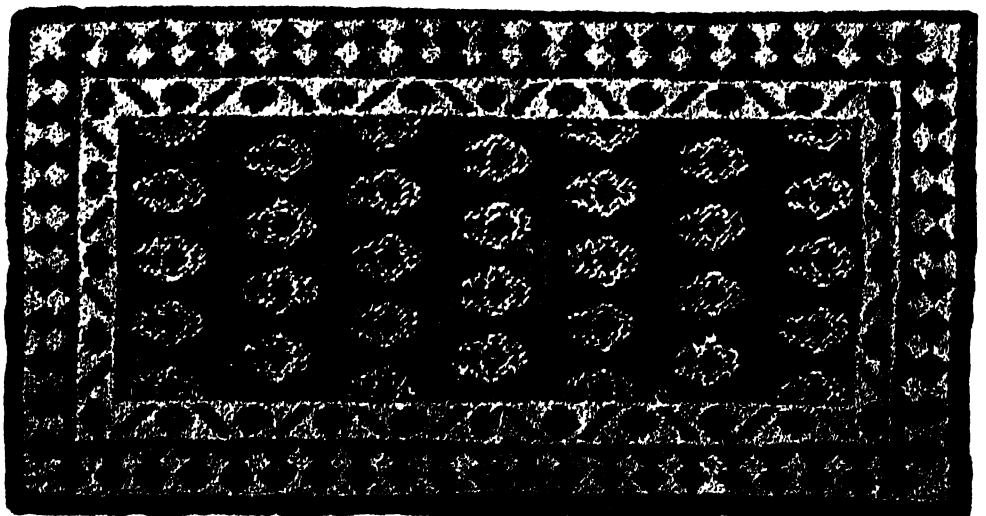
Oriental Rugs. Although European weavers began to employ their looms for rug and carpet making in the 15th century, copying the knotted examples which were imported from Turkey, until the age of machinery Oriental rugs far exceeded the supply of those made in the West.

Like other textile fabrics, Oriental rugs have interlacing warp and weft threads; in addition to these fundamental threads they are composed of countless short pieces of coloured yarns, the cut ends of which form the pile. Each knot or tuft is tied by hand. Many or few dyes may be employed, but in most Oriental rugs an immense number of shades are selected to make the design, thus giving the weaver great scope for original work. Knotting may be fine, which adds to labour but enhances beauty of forms employed; or it may be coarse, in which case bold patterns are generally worked.

With regard to Persian rugs, it should be noted that many rugs not strictly made in Persia are described under that title. Indo-Persian rugs are well woven and of fine colour, but the detail of the designs is not usually so good as in the Persian carpets which influenced them. Some of the Caucasian rugs are notably rich in colour, interesting

designs and motives. The two best known are the cloud band and the dragon. The former is symbolical of heaven. Symbolism plays a prominent part in the designs of Oriental rugs. Even mistakes sometimes occur deliberately to divert the evil eye, or because the devout worker considers it impious to produce perfect work, as only Allah is perfect.

Animal designs occur in many Persian rugs. The antelope is often figured, and stands for the moon, night and restfulness; while the lion stands for the sun, power and day. Hounds and leopards symbolise success



Rug with effective pine cone design worked in shades of terra-cotta, bisquit, pale green, gold, tan, and deep blue

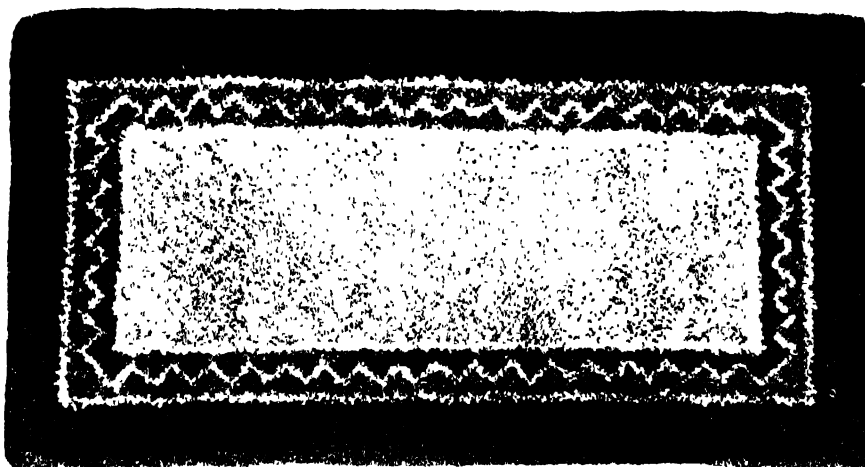
rugs are excellent for bedroom or nursery, and most of them are reversible. Fibre rugs woven in good colours are suitable for bungalow and informal rooms. Skin rugs of leopard, tiger, wolf, raccoon, bear and goat are handsome, but when laid on parquet floors have the great disadvantage of slipping easily. Skin hearth rugs are best removed in summer weather, as they tend to give a room a hot appearance.

Beautiful rugs are hand-woven in straight geometrical designs. The colourings are harmoniously graded and often in browns, natural wool colour, and a variety of beige shades. The interest is gained by subtle shading, and the patterns are usually of the simplest kind, such as cubes and broken stripes, and just sufficient to introduce pleasing light and shadow effects. Colours may appear to contrast violently, but this contrast is obtained in the same way as in old tapestry--by the skilful use of several gradations of each colour so that it never appears dead or crude.

Handwoven Wool Rugs. There are various methods of making wool rugs, but the general one is to hook the wool through the canvas or hessian to give a series of little tufts so closely worked together that they form a pile like that of a carpet. The canvas takes the place of the warp and weft threads of the Oriental rug. There is special canvas to be obtained for the foundation marked in squares of 8 ridges. If the wool is of fine quality like the 6 ply Turkey rug wool, it is worked into every ridge, but if of the coarser 2 ply cable wool it is only knotted into every alternate one.

By means of a gauge, the wool is cut into little equal pieces, each about 2 in. long (Fig. 1), ready to be hooked into the canvas. To make the actual knot, a coarse crochet hook will do, though there are several patent instruments on the market. One, Fig. 2, is like an ordinary crochet hook with a movable latch, which prevents the hook from catching when drawn back through the canvas. Another, Fig. 4, is like a pair of pliers which by a simple device knots the wool on the canvas in one operation. Both make the same slip knot.

Chart designs are available from the various wool shops marked in squares to correspond exactly with the squares on the canvas. This



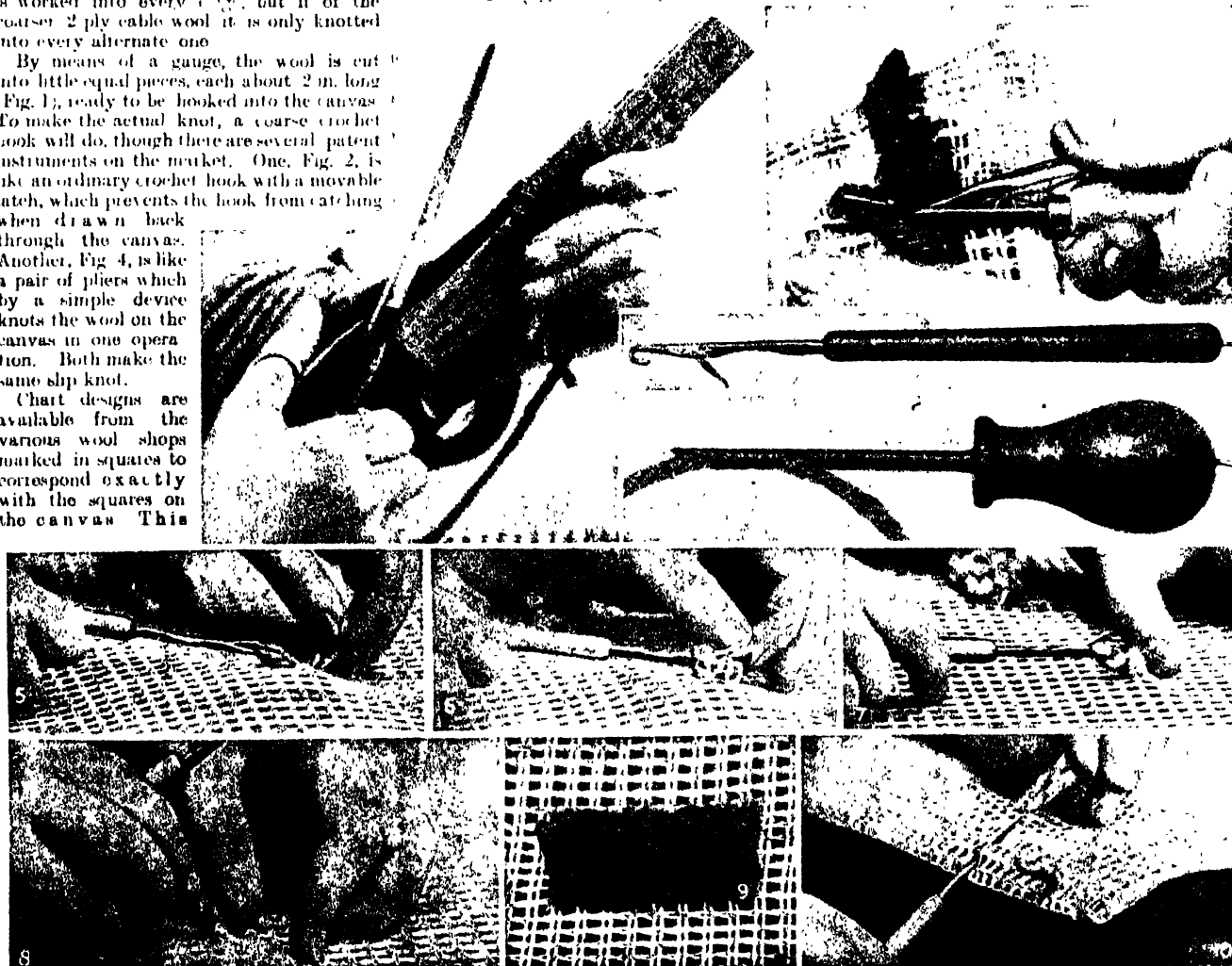
Rug worked in wool of five colours on coarse canvas, in a simple design suitable for either bedroom or living-room. The method of work is shown in the illustrations below.

makes the working out of an intricate design very simple indeed. But simpler still for the plainer designs is the canvas which has been stencilled with a pattern. Lay the rug when finished with black hessian which will make it softer to the feet and more durable in wear.

When beginning a rug, turn in the end for 14 in. and work through the two thicknesses. This will give a firm edge, and when the other

end of the rug is reached that should be turned in in the same way (See Fig. 10). The selvages at the side of the canvas are strong enough without turnings. The easiest manner to work is to place the canvas on the table and knot in rows from left to right, the finished part being nearest the worker.

Patterns may be inspired by Oriental motives such as the nine cone design. The



Rug: method of making. Fig. 1. The wool is cut in short uniform lengths by means of a grooved gauge. Fig. 2. Regulation rug-making hook resembling an ordinary crochet hook with movable latch. Fig. 3. Another method is by use of a hollow metal tube into which the wool is threaded. Fig. 4. Knot-making tool in use. Fig. 5. Using regulation hook: to knot the wool on the canvas it is first doubled and drawn through under a ridge. Fig. 6. The hook is pushed through the loop so that the wool lies behind the latch, and the two loose ends are hooked. Fig. 7. These ends are pulled through the loop, the latter sliding over the latch. Fig. 8. The knot is then pulled tight and a similar tuft made in the next ridge, and so on. Fig. 9. A row of eight tufts. Fig. 10. To make a neat selvage an inch of canvas should be turned up on to the face of the work.

trated, or they may be simply geometrical and worked in dark brown, havana brown, and three shades of beige, as in the other example shown. Designs should always be conventional even where figures are introduced into nursery rugs. Squares, circles, triangles, and simple designs of flowers and leaves are all suitable for rug making, but the art of the designer lies in combining them successfully.

The particular kind of wool used is a matter for individual taste. What is known as cable wool is a curly 2 ply yarn. It is more lustrous than Turkey rug wool, and produces a rug of a softer and longer pile. The pile of Turkey wool however is wonderfully firm. It measures about $\frac{1}{2}$ in. in depth, and resembles more closely the pile seen in Eastern rugs.

A most ingenious way of making a pile rug on hessian is by the Kwikumak method. The instrument, Fig. 3, which is fitted into a wooden handle, is a simple hollow metal tube pointed at the end and having a hole about 1 in. from the end. Through this hole the wool is threaded. As the instrument is pushed through and through the hessian, following a stencilled pattern, it leaves loops on the other side of the material. These loops, when afterwards they are cut evenly with the scissors form a close pile.

Rag Rugs. There are two methods of making rag rugs. In one the rag is pulled through the canvas with a large crochet hook, while in the other the rags may be braided or twisted and sewn together. All kinds of rags are suitable for this purpose. For a hooked rug a piece of strong open meshed hessian or sacking is required. Having measured off the required size, hem or crochet it all round to give a firm edge. Stencil or draw in chalk a pattern upon it; an old fashioned posy or wreath of flowers worked in bright colours in the centre suits these old world rugs. Various grotesque animals and birds were also worked in the brighter rags, leaving the more nondescript coloured ones for the background.

For a hooked rug, the rags need to be about $\frac{1}{2}$ in. in width more or less, according to the thickness of the various materials. It is not essential to sew the strips together, though the longer they are the quicker they can be hooked through. Use a coarse crochet hook for the work, the canvas is often stretched in a frame, but it is easy to work without. Place the pile of strips under the canvas either in the lap or under the table. Hook the strip of rag through the canvas to form a loop about $\frac{1}{2}$ in. in length. Then make another loop close by, and continue until the canvas is covered. The loops are then clipped to give an even, mossy surface. A hooked rug should be lined with hessian to give it greater strength. To braid a rug like that shown in Fig. 11, it is necessary to cut the rags about 3 in. wide. If they are made



Rug, Fig. 12. The strands are plaited closely and evenly to make braid for the rug shown below

must be sewn together and pinned on to something firm. As soon as 1 ft. or more of the plaiting is finished, the sewing together is begun. This is done with strong, waxed thread. When making a circular rug, the braid is then wound round and round flatly, edge to edge, and the needle passed through and through in close, invisible stitches. A little practice is required to make the braid lie flat. If too tightly wound it will buckle, but it must not be too loosely done, or the work will look rough.

To make an oval rug, begin with a long-shaped centre, and wind round it. A dark centre usually looks well with outer rings of light and dark alternately. A skilful braider can work in the colours while she is plaiting to a definite design. As the end of each strip of rag is reached, sew on another one. It is just as well if the strips are uneven in length, as then the joins will not come all in one place; but this, of course, must happen when introducing a fresh colour, and then the join must be neat. Rag strips, $\frac{1}{2}$ in. wide, can be crocheted, using a large hook. Before beginning, join the strips together and wind into a ball. Begin by making 5 chain, join into a circle and then crochet round, increasing in order to make work lie flat.

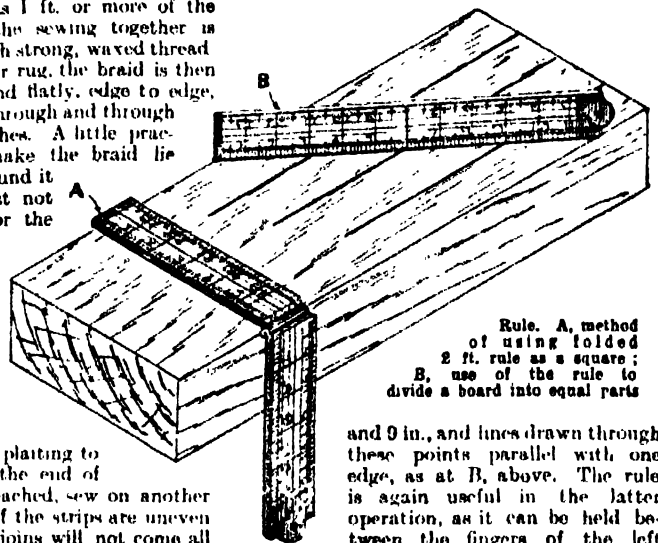
narrower than this it is rather difficult to turn in the edges as neatly as is necessary for tidy work. The edge should be turned in about $\frac{1}{2}$ in., and the strip folded over in half lengthways, so that the raw, frayed edges are inside. This may be done while braiding, but if the material is stiff and wiry it is better to press it into its proper folds. Strips may be joined together to give lengths of about 1½ yards each, and are best folded and pressed beforehand, and wound on to pieces of cardboard to keep them in good shape.

Plait the strips closely and evenly, just as hair is plaited, with 3 strands, as illustrated in Fig. 12. The ends

RULE: For Measuring. Of the many varieties of rule in ordinary use some are of wood and others are made of steel and other materials. Those made of wood range in size from the 6 in. rule supplied with small sets of drawing instruments to the 6 ft. lath used by the glazier. For amateur use the most convenient is the 4-fold 2 ft. rule. This is marked on both sides in opposite directions, and although usually divided into $\frac{1}{16}$ ths and $\frac{1}{8}$ ths, it can be obtained in $\frac{1}{32}$ ths and $\frac{1}{4}$ ths.

In making accurate measurements with a wooden rule, the edge should be used so that the marks can be transferred direct, and when several measurements are required on the surface of a board, they should be added together. For example, if distances of 2 in., then $\frac{1}{2}$ in., then 1 in. and $\frac{1}{4}$ in. are required, the method is to mark off 2 in. first from the edge next 2½ in., then 3½ in., and finally 4½ in.

The 4-fold rule can be employed as a square by folding it in the centre and the two halves together at the knuckle joint between 5 in. and 7 in., as at A, below. In dividing wide boards into equal parts, the quickest method is to lay the rule diagonally across the wood so that opposite corners are touching. For example, supposing the board to be 10½ in., and it is required to divide it into 4 equal parts, the pencil should be placed at 3 in., 6 in.,



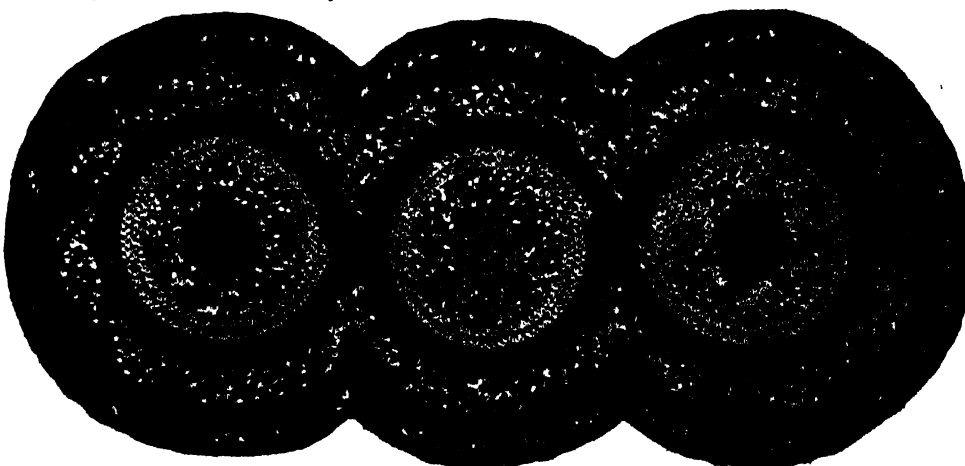
Rule. A, method of using folded 2 ft. rule as a square; B, use of the rule to divide a board into equal parts

and 9 in., and lines drawn through these points parallel with one edge, as at B, above. The rule is again useful in the latter operation, as it can be held between the fingers of the left hand, the pencil placed on the point, the brass tip of the ruler placed against it, and, with the fingers of the left hand acting as a guide, both ruler and pencil can be drawn down the wood. This is called lining with rule and pencil.

The engineer's steel rule is obtainable without a joint and engine divided into 12 in., with the usual sub-divisions: the rule is also made as a 2-fold 2 ft., a 1 ft. 2-fold, and a 1 ft. 4-fold. The steel rule is essential for accurate metal working, the first-mentioned size being the most suitable.

Steel rules should be rubbed occasionally with an oily rag, as perspiration from the hands and dampness will soon make them rusty. See Measurement; Plumb Rule.

RULE JOINT. Used for tables and drop leaves, the rule joint is a method of hinging two pieces of wood together so that a neat, closed joint is shown when the leaf is down. It is better than the square joint, which shows a space between the two hinged pieces. The joint is shown in Fig. 1 with the leaf up and in Fig. 2 with it down; A is the fixed top, B the leaf, C the centre pin of hinge, and D the commencing point of the curve of the joint. It will be seen



Rug, Fig. 11. Braided rug made with plaited strands of coloured rags arranged to form an attractive design

in Fig. 2 that a semi-circle is formed when the leaf is down, the centre being at C, and that this necessitates the hinge being let into the wood. The hinge (Fig. 3) is specially made for rule joints, and is known as the table hinge; it is similar to a back flap, but as it is attached with the knuckle in the wood, the screw holes are countersunk on the opposite side. Hinges are made in sizes from 1 in. to 1½ in., 1½ in., and 2 in.

The table hinge should not be confused with the rule joint hinge shown in Fig. 4, which is used for another purpose. The method of marking out is shown in Fig. 5; the two pieces of wood should be the same thickness, and the gauge line at C should be the depth of the hinge. The distance of the centre C from the end of the wood should be about ¼ of the thickness of the wood. Special planes are made to form the joints, but the latter can be easily cut with ordinary rounds and hollows.

The first stage in working the round is shown in Fig. 6, a rebate being cleanly cut to the level of D. The second stage, in Fig. 7, consists of rounding the corner to a true quadrant, and then forming the hollow in the opposite piece so that the edge at the top equals that at D and the curve is the exact opposite to the round. The two parts are placed together and the slots for the hinges marked out and cut. The short part of the hinge is on the side with the round and the pin of the knuckle is exactly under the top at D. The work can be polished in the ordinary way before the hinges are attached, but they should have been fitted previously. The rule joint hinge shown in Fig. 4 can be employed for narrow flaps, the edges of wood being shaped as above, but it is more suitable for hinging flaps which are to fold over flat, and is used in some card tables. See Hinge; Joint; Rebate.

RULE OF THE ROAD. By this phrase is understood the rules that should be observed by persons who drive vehicles of any kind on the roads. In Great Britain the main rule is to keep to the left. Another important rule is when overtaking another vehicle to pass it on the right. In crossing, the driver should bear to the left and pass behind a vehicle coming from the left. Drivers who infringe these rules are liable to legal penalties. See Driving; Motoring; Road.

RULER) The words rule and ruler are often confused; the former relates to measuring, the latter to the drawing of lines. The rule can be used for the latter purpose, but jointed rules are not convenient for this. The ordinary boxwood 12 in. rule serves the double purpose and the round ruler is useful for drawing parallel lines. A flat ruler has a bevelled edge to prevent smudging when lines are drawn in ink. See Rule.

RUM; The Liquor. Rum is a spirit distilled from fermented juice of the sugarcane or from molasses. It is coloured with caramel and improves with keeping. Sometimes pineapple and guavas are added in the making. Rum and milk is said to be one of the most powerful restoratives, and an old-fashioned remedy for a cold is a steaming

tumbler of rum and hot water with a piece of butter melted therein. Equally effective is hot rum and water with a slice of lemon. It should be taken in bed. Rum, or synthetic rum essence, is used in cooking as a flavour. See Omelette; Punch.

RUMMER; The Glass. This word is used for a large glass made chiefly at the end of the 18th century and valued by collectors. In size it is between a wineglass and a tumbler, and was used for grog. Some have moulded flutes at the base and are sometimes decorated in festoon style. Others are larger and more solid, with a collar at the base of the bowl.

Other varieties of the rummer include one with a rounded bowl and a fluted base, one with a bowl in the shape of a barrel; and one, less common and more beautiful, with a wide-spreading bowl in the shape of a funnel.

RUMMY. A card game, for several persons. Its rules vary widely in several versions, but the basic principles are that each plays for himself, and tries to develop the hand originally dealt him (of seven or eight cards) by drawing from the pack and discarding in such a way as to collect groups of cards either of the same denomination (e.g. three or four kings) or in sequence in a suit (e.g. 8, 9, 10 of diamonds). In some variations the player may put down combinations as they are completed; in others, he fills his hand and then "knocks," which allows only one more draw to each opponent. He may be allowed to take up the discard of his previous player, or, in a good three-handed variety, all the discards down to the one actually used to complete a combination. When any player has gone "out," the others are debited points according to the ungrouped cards in their hands. In gin rummy, a game for two, it is permissible to knock when the pips on such cards (termed deadwood) total less than ten.

RUNNER; In Woodwork. In chests of drawers or most pieces of cabinet construction, runners are fitted to rest the drawers upon. Usually they are tenoned into the framework and in addition support the dustboard. See Chest of Drawers; Dresser.

RUNNER; The Cloth. This word is used for a narrow cloth, usually embroidered or ornamented in some other way, that is placed across a dining table, dressing table, or sideboard.

RUNNER BEAN. The colloquial name of runner bean is given to the climbing or trailing forms of edible beans. They are also alluded to as scarlet runners, from the colour of the blossom. See Bean; Scarlet Runner.

RUNNING; In Needlework. This is the simplest stitch, and the first to be taught in needlework. The needle is passed in and out of the material at regular intervals, taking up 3 or 4 threads at a time in a horizontal line. If the fabric is sufficiently soft and thin, several stitches are taken on the needle at once before the thread is drawn out. This stitch is used for plain seams and for making gathers. See Gathering; Seam.

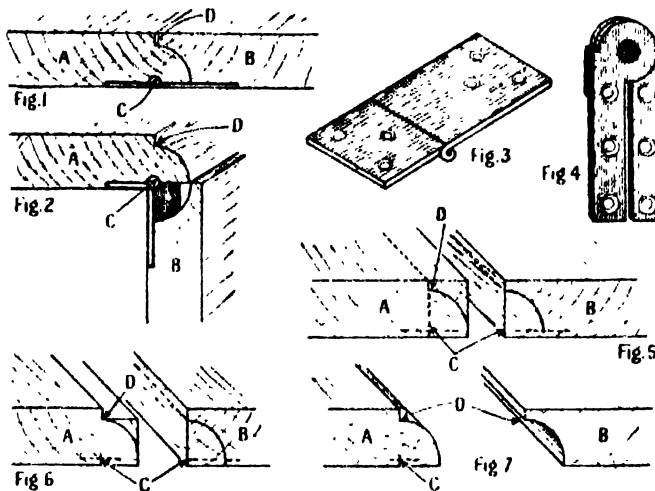
RUPTURE; Its Treatment. In its widest application rupture or hernia is the abnormal protrusion of part or the whole of an organ of the body through the wall of the cavity that contains it. It occurs chiefly, however, in relation to the contents of the abdomen, and in the majority of cases the part which thus comes through is a portion of the intestine. The cause is generally either weakened areas in the abdominal wall or increased pressure of the abdominal contents due to some injury or sudden strain, as in lifting heavy weights, but there are also other causes, as, for example, severe chronic cough in old people.

There are several kinds of abdominal rupture, the most common being inguinal hernia in the groin; femoral hernia is also in the groin, and umbilical hernia at the navel. A ventral hernia is a protrusion through a weak spot such as may be present in the scar of a wound, as, for instance, after the operation for appendicitis. A strangulated hernia is one in which the circulation of the blood is obstructed and is always dangerous.

A rupture appears as a rounded or pear-shaped swelling, the lower end usually being the broader. It increases in size when the patient stands, coughs, or makes a muscular effort. If it is a reducible hernia, it slips back into the abdomen when the patient lies down and presses on the swelling with his hand. On his standing up it again comes out.

The treatment of inguinal hernia consists of the wearing of a truss, or an operation for what is known as the radical cure. When a truss is used, great care should be taken never to let the intestine come down even once, for whatever closing of the part has been effected will be at once undone. In adults a truss should fit perfectly, otherwise it may do harm by causing inflammation and favouring strangulation.

Femoral hernia is more common in women than in men. A rounded swelling appears in



Rule Joint for the drop-leaf of a table. Fig. 1. Sectional view of rule joint with leaf up. Fig. 2. Same with leaf down. Fig. 3. Detail of the table hinge. Fig. 4. Rule joint hinge for use with a flap folding flat over itself. Figs. 5-7. Details of construction of the rule joint shown in Fig. 1.



Rummer. Large-sized rummer, the engraved decorative design including agricultural implements. Courtesy of Cecil Davis.

front of the thigh towards its inner side just below the junction with the abdomen. As in other forms, the treatment is either palliative by means of a truss or curative by operation.

There are three varieties of umbilical or navel cancer, the congenital, which is very rare, the infantile and children, which is common, and that which occurs in adults, most frequently in women who have had several children. If properly treated this form of cancer in infants can be cured easily. The

lips of the opening should be drawn together and held so by a strip of plaster, or a penny or a stick of lead may be wrapped in lint, secured over the navel, and held in place by strips of plaster. In adults the palliative treatment consists in wearing a truss, or sometimes an abdominal belt which requires the addition of a truss pad. If obstructive cancer of the fundus becomes larger and firmer, the latter should be removed immediately.

In strangulated hernia severe pain extends through the abdomen, and there is vomiting, constipation and collapse. The doctor should instantly surmise that when a patient who has a hernia suddenly finds that it will not go back, when he has pain or discomfort in the inguinal region, when he suffers from disturbance of digestion or from nausea or sickness. In

adults may prove to be groundless, but it is important that no risk should be run.

To prevent hernia, infants should be kept, if possible, from excessive crying and constipation should be prevented. Adults should avoid wearing belts, and excessive muscular straining after operations on the abdomen. Women should avoid tight lacing, and wear an abdominal bandage after childbirth.

RUSCUS. A group of low-growing, hardy evergreen shrubs of which the chief kind is the butcher's broom (*Ruscus aculeatus*). This grows 2½ ft. high, has pinnate, scabbed leaves which are usually in thick branches, and small greenish flowers.

Male and female flowers are on separate plants, and both kinds must be planted to insure a crop of the red fruits in autumn. The branches become woody in shady places.

RUSH: In the Garden. A few of the rushes are attractive, water-side plants, but most of them are of little value to gardeners. One of the most striking is the porcupine rush (*Junon. tenax*, *Junon*). The leaves are marked with bands of green and white. In *Junon* spirals the leaves are spiral.

Rush Lily. Another name for the satin flower or *Veratrum*. See *Satin Flower*.

RUSH WORK: A USEFUL HANDICRAFT

With Directions for Making and Repairing Chairs, Stools and Baskets

For women and girls of all ages, and for all classes of people. By Miss Waring, Can. Ont., Raffle, Wm. W. W. Co.

When the rush is used as a chair seat, as in Figs. 1 and 2, and for making baskets, mats, and many other useful articles, it is a strong, soft, comfortable and inexpensive seat, and has the advantage of being easily worked.

Two varieties are commonly used, ordinary green, known as green, but none of a brownish green, and one of a yellow-green. The latter is considered to be the better quality for general use. The rushes should be gathered in the autumn and carefully dried, they require a long preparation, as the drying leaves them in the form of fibres. They are not suitable in large bundles and lengths up to 10 ft., and after dipping them in water and leaving them for a few hours they are ready for use.

Reseating a Chair. Although the framing of chairs is of special design when the seating is of rush, it is possible to reseat almost any kind of frame provided that the corners, which will not be covered by the weaving, are built up to the same level as the rest of the seat. If a chair is to be re-seated with rush, all the old material must be removed and the frame work thoroughly cleaned, but it will be helpful to the beginner if he or she notes carefully the method of weaving when removing the old rush, to see where the rushes are twisted, and where they are used singly, and also where and how extra laths are added.

The rails of the rush seat frame are mortised in about 1 in. below the top of the legs, and a corresponding amount is left in the outside, but the inner ends of the rails are usually flush with the inner faces of the legs. Begin with one long, stout fibre and secure the thick end to the inside of the framework, as in A, Fig. 3, using a stout tack or a lead nail. Bring it over to the front rail, quite close to the raised corner, and commence to twist from left to right. Carry the twisted portion down on

the front, underneath the rail marked 1, around the back of the leg, and bring it up over the front rail and around 2. The twisting should be continued for about 4 in. past the rail, and then the fibre should be carried to the opposite rail, 3, by sliding it in to carry it over the front rail and on.

The fibre should now be brought to the inside under the rail, over the first twisted strand on to the front rail, and around underneath it, as in B. Next carry it twisted to the opposite corner, 4, along side the right hand rail marked 3, then take it over the back of the rail marked 4. Bring it up under, carry it over rail 3 and over it right across to rail 2 at the corner at D. The fibre then is carried under rail 2 over the twisted strand and rail 1 and underneath on to the front rail. As the length of each fibre taken round the frame it is necessary to add new lengths continually. The stronger method of joining two lengths of rush is shown in Fig. 4, and is known as the reef knot. The method generally employed by the professional, as in Fig. 5, is a quick and

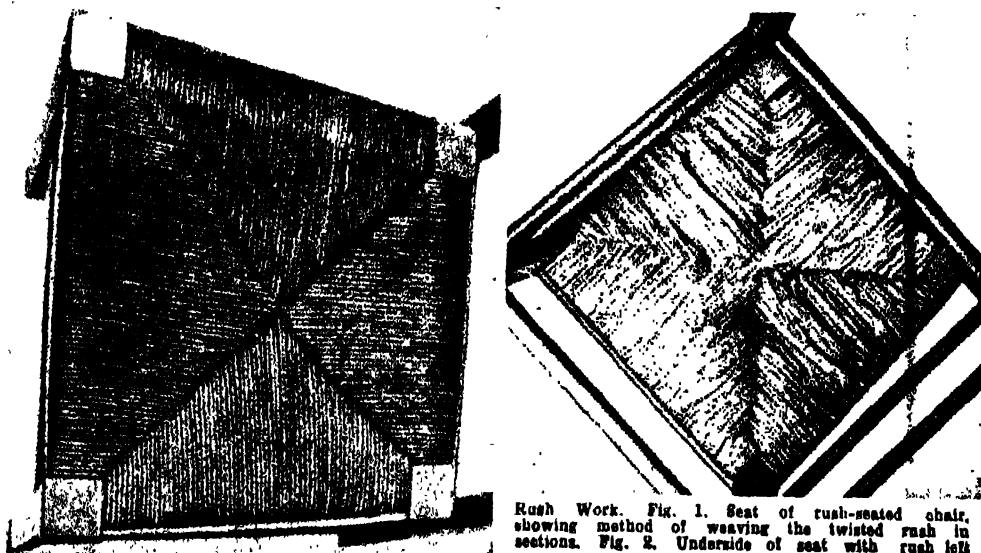
simple. After a little practice the twisting will be easily done with the right hand alone, but the direction of the twist from left to right should not be overlooked, and the twist should not be allowed to get slack. When the single rush is twisted, it gives a fine strand, and it is usual to twist two lengths of rush together at the same time, to produce a thicker strand, as at Fig. 6. This will not be found difficult after a start has been made, but care should be taken to keep the twisted strand an even thickness.

When the weaving has been continued for a few complete rounds, Fig. 7, it will be seen that a pocket is formed between the upper and lower strands. This must be kept well stuffed with waste or broken rushes, it helps to keep the strands together and give a fullness to the seat. Continue with the same order as indicated in Fig. 3 until the centre of the chair is reached, Fig. 8, keeping the pockets between the rushes neatly picked so as to give a sweep to each of the sections. Usually a chair is narrower at the back than in front, and in this case the easiest way of bringing the sections to an even centre is to have a finer twist at the back than in the front in order to make up the difference in the lengths of the two rails.

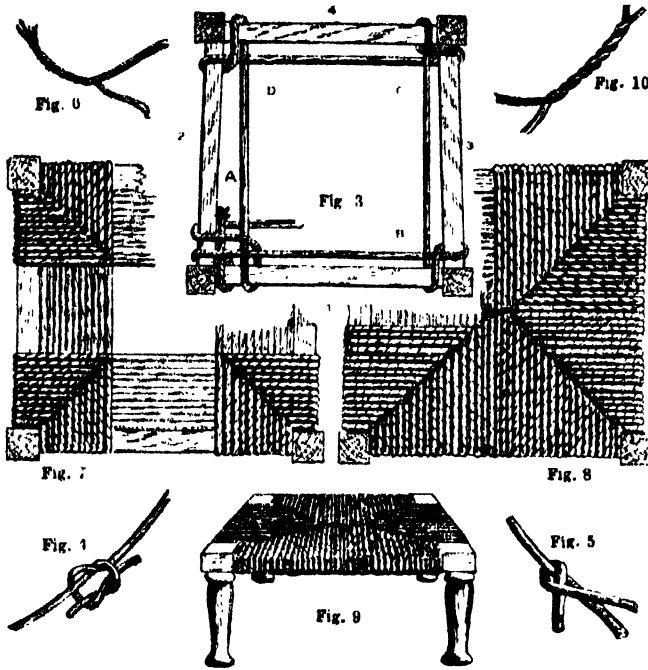
When the corners of the sections do not come to a point in the centre of the seat, the remainder of the work can be done by carrying the strands over one rail and under the next alternately in the form of a figure 8. This method fills up the space effectively and is particularly useful when dealing with rectangular frames. The twisting of the rush is the work proceeds has the effect of bringing the points of the twist to the inner side of each corner, this effect should be continued when filling up straight portions.

A Rush Stool. The easiest piece of work the beginner can have to practise on is a small stool, Fig. 9. This can be moved round as the work progresses more easily than a chair, and the frame is usually rectangular. An effective method of seating is to use two colours, the ordinary brownish green and the golden salt rush, twisted together. The alternation of colour, Fig. 10, is very effective.

Cleaning Rush Chairs. To renovate rush-seated chairs that have become dirty with age or use, but are otherwise in good condition, the whole of the framework and seating should be scrubbed with warm soap-suds to which a little washing soda has been added. When as clean as possible, the work should be thoroughly rinsed and allowed to dry slowly. The woodwork should be rubbed with an oily rag. It will not be possible to restore the rush to its original freshness of colour, but the seating can be stained with an aniline dye.



Rush Work. Fig. 1. Seat of rush-seated chair, showing method of weaving the twisted rush in sections. Fig. 2. Underside of seat with rush fells untwisted.



Rush Work. Fig. 3. How weaving is begun. Fig. 4. Reef knot for joining lengths of rush. Fig. 5. Professional knot. Fig. 6. Two lengths twisted to form a strand. Figs. 7 and 8. Stages in weaving. Fig. 9. Small rush-seated stool. Fig. 10. Two-colour twist.

The method is to dissolve $\frac{1}{4}$ oz. green aniline dye in 1 pint hot water, then add $\frac{1}{2}$ gill strong vinegar. Apply the stain with a brush, giving the work 2 or 3 coats, according to the depth of the colour required. When the stain is quite dry, make a size by dissolving $\frac{1}{4}$ oz. glue in 1 pint hot water and apply this while still hot to the whole of the stained surface.

Rush seats that have a few broken strands need not be re-seated if the rest of the work is in good condition. The method of repairing is to pull the broken strands through to the underneath, and to join on a new length to the corresponding straight length. The new piece should be twisted and pulled through to the top, carried over the frame, and then tied with a loop after passing it under a few strands. There is a limit to which repairs of this kind can be carried, but if the material is not very old and has not perished the work it can be done with success.

It is usually the front edges of the seating which wear away quickest, and if many of the strands have given way it will be more satisfactory to re-seat the whole.

Rush for Baskets. Rush is used in making baskets, bags, and in other small ways. It is often combined with cane to produce such useful articles as the basket illustrated in Fig. 11. It is worked in its natural form and also twisted and plaited. Examples of plaiting are shown in Figs. 12-16.

The simple twist at Fig. 12 is done with two rushes as follows: The thick ends together and secure them to a hook in the wall or over a convenient nail. Hold one rush in each hand and twist outward, then take the right hand rush over the left one, at the same time bringing the latter under the right one. The rushes are transferred to the opposite hands and the movements repeated, inserting a new rush when required and keeping the twist of a uniform thickness.

A double twist is accomplished by first making 2 simple twists as above and tying them together and treating them as single rushes, but the twisting should be in the opposite direction, that is, from left to right; this prevents the twist curling.

The 3-way plait at Fig. 13 is commenced with 3 rushes tied together and held in the left

hand, using the thumb and fingers to keep the plait even. The right hand is used to do the plaiting, each length of rush being brought from the back over towards the centre. New lengths are placed on the inside of a right-hand length, and the 2 lengths plaited together, leaving the end of the old one underneath when finished with.

The plaited braid at Fig. 14 is particularly effective, it is formed by first plaiting 3 rushes as at Fig. 3 for 6 in., then one of the lengths is held firmly in the left hand while the right hand is used to push up the plait to reduce its length to about 2 in. Note the length which was held tight, so that when another 6 in. of plait is done, the same length can be held while the other two are pushed up close to the first.

The 5-way plait at Fig. 15 is made with 5 rushes by interweaving each rush diagonally under one and over one the outside rushes being so arranged that they start from the back and come forward over the next rush and towards the centre. Wider plaits can be made in the same way by using 7, 9 or 11 rushes.

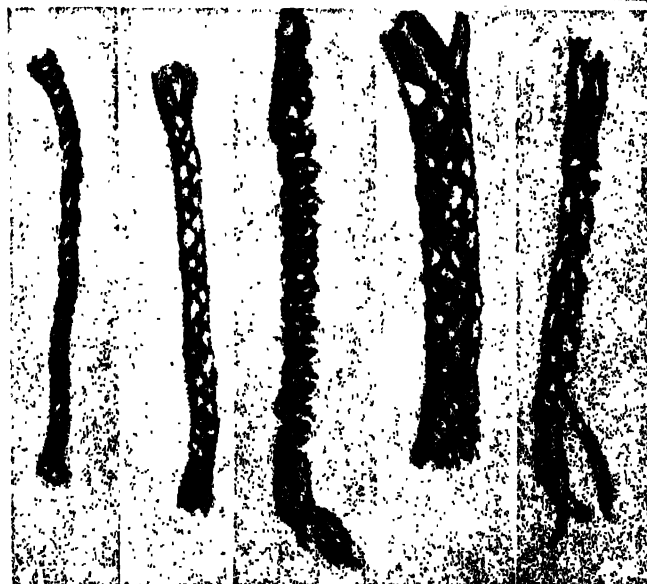
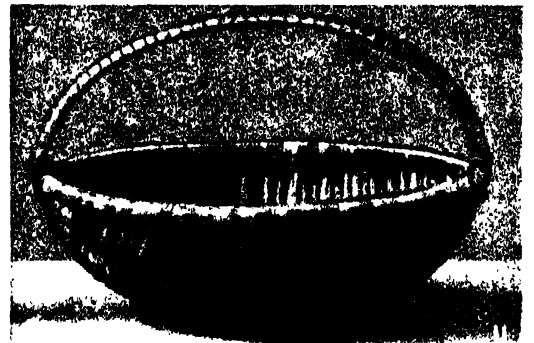
The rattle twist at Fig. 16 is made with 5 rushes of even size tied together and held vertically in the left hand. Take one of the rushes and bend it behind the two next to it on the right, do the same with the others in order, until they are laid down. Continue by laying each rush in its turn across the centre and over the last one

turned down and the one next to the latter on its right. The same movements of the thumb and finger should be used in every stroke for the building up of the twist. As the thin portion of the rushes is reached, add a new length.

Rush and Cane Combined. The melon-shaped basket in Fig. 11 is a very effective way of using rush, the framework being made of split cane. The first stage is to make an oval band with a length of stout split cane, the joint being made by making 2 tapering cuts so that the ends of the cane can be joined up evenly and bound together. A useful size is 12 in. by 9 in. A second band is now made in the same way, but a trifle larger, this is fitted over the first oval so that the two are crossing each other.

The ends are bound together with raffia over and under until a small pocket is formed underneath on each side of the vertical oval. Two lengths of split cane equal in length to half the horizontal oval are bent and slipped into the pockets and then the binding is continued, but the extra lengths are included in the over and under binding. These two pieces should be equally spaced, and when the pocket formed by the raffia is large enough similar lengths of split cane should be fitted in. The 9 lengths are bound together, weaving the raffia over and under alternately until they are firmly secured. Both ends are worked alternately, and can be finished off with raffia of a different colour.

The remainder of the basket is filled in with flat rushes by commencing at one end and running a length out in plain weaving over and under alternately, repeating the operation from the other end. This is continued to the



Rush Work. Fig. 11. Combined with cane, rush can be woven into a basket with twisted handle. Fig. 12. Simple twist. Fig. 13. Three-way plait. Fig. 14. Plaited braid. Fig. 15. Five-way plait. Fig. 16. Rattle twist.

Fig. 11, courtesy of Dryad Handicrafts

centre of the basket, the work being kept as close as possible, because the damp material used in the first place will shrink when it dries.

The handle can be given a decorative finish by twisting the rush spirally round it and carrying a wide length of coloured raffia with it, so that the raffia is covered in one turn and exposed in the next, and so on throughout the length. A stronger basket can be made by using tapered ash splints.

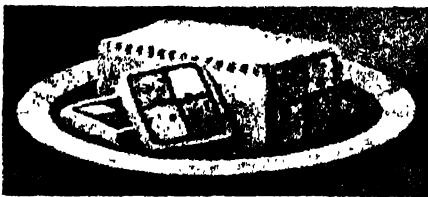
Plaited rush forms a most convenient and cheap method of filling up the sides of many kinds of basket woven either in cane or osier and suitable for wastepaper or work baskets.

RUSK: The Biscuit. Rusks are made in small round shapes. As soon as they are baked they are split open and reheated until they are so crisp and dry that they will keep fresh for some time when packed in airtight tins lined with grease-proof paper.

To make, sift 1 lb. fine flour with a pinch of salt, into a basin, then dissolve 2 oz. margarine in $\frac{1}{2}$ gill milk. Cream $\frac{1}{2}$ oz. yeast with 1 teaspoonful castor sugar, and stir into it the warm milk and margarine. Now beat in 3 eggs. Pour these ingredients into the centre of the flour and work them into a dough. Cover the bowl over, and let it rise till very light. When risen, knead it till smooth, then make the dough into balls about the size of a large egg only flatter. Lay these in rows on a floured baking-sheet and let them prove. Bake in a hot oven for about 15 min. Take up the rusks on to a sieve split each in half and return to the tin with the broken side uppermost. Crisp them in the oven, then cool and store them.

Rusk Pudding. A very good steamed pudding can be made with rusks. Soak 4 rusks in 1 pint milk for $\frac{1}{2}$ hour, then beat these up fine, add 6 oz. cleaned and picked currants, 2 oz. chopped candied peel, the rind of a lemon (grated), $\frac{1}{2}$ teaspoonful nutmeg, and a pinch of salt. Cream 2 oz. margarine with 3 oz. castor sugar, add by degrees 2 well-beaten eggs, and stir this to the rusk mixture. Steam in a greased basin for about 1 $\frac{1}{2}$ hours. Serve it with sweet or brandy sauce.

RUSSET: The Apple. Apples of the russet family are distinguished by a skin of rough texture and russet-brown colour. Generally these are of brisk flavour, and include the well-known *Ard Carn*, *Boston*, *Brownlee's*, *Egmont*, *Golden*, *Pineapple*, and *Royal russets*.



Russian Cake, made in four separately prepared blocks and coated with almond icing

RUSSIAN CAKE. Whisk 4 eggs with 9 oz. castor sugar for about 15 min., or until the mixture is free from dark streaks, then fold into it $\frac{1}{2}$ lb. flour previously sieved with 1 teaspoonful baking-powder. At the same time, add $\frac{1}{2}$ lb. melted margarine, and, if necessary, a small quantity of milk.

Mix the whole lightly, then turn half of it into a small greased baking-tin lined with greased paper that reaches just above the sides. Colour the remainder of the mixture with a few drops of cochineal, put it into another prepared tin of the same size, and bake both in a hot oven for about 10 min. Then turn the cake carefully on to a sieve to cool and take off the greased paper. When cold, cut each cake into long strips.

Warm a little plum jam, thinning it down, if necessary, with a little water, rub it through a sieve, and then take two strips each of the white and pink cake. Brush one side of each with the jam and stick them together, arranging the colours alternately. Wrap the block tightly in grease-proof paper, lay it on one side, and then proceed to make another block in the same way.

Prepare some almond paste, rolling it out to a long, thin sheet. Brush the outside of the blocks with warm jam, then cover them with the icing, smoothing the surface with a knife which has been dipped in hot water. See Almond Paste.

RUSSIAN POOL. This billiard game is played on an ordinary billiard table by two or more players. Five balls are necessary, white, yellow, green, blue, and black. The white is the ball struck by the cue. A game consists of 200 points, or any other number that may be agreed upon.

To begin the game, the black ball is placed on the spot, the blue on the centre spot, the green on the left, and the yellow on the right corner of the D. The striker then plays the white ball from within the D, and his opening stroke must directly strike the black ball. He can then play at any of the others. The play is very similar to that in ordinary billiards. Scores are secured by making cannons, by sending the white ball into a pocket off one of the others—a losing hazard, as it is called—and by sending a coloured ball into a pocket, a winning hazard. In Russian pool, however, the black ball can only be used for the two top pockets; the blue for the two middle pockets, and yellow and green for the bottom two pockets. For a simple cannon 2 points are scored. If the black is used for a hazard 9 points are scored. The blue scores 7, the green 5, and the yellow 3.

The rules of the game are drawn up by the Billiards Association and Control Council. See Billiards; Pool; Snooker Pool.

RUST: How to Avoid. In the home all fittings or articles that are made of steel or iron are liable to rust. This appears in the form of yellow spots, and is due to damp, exposure to the atmosphere, and other causes which set up chemical action in the metal.

There are a number of methods of protecting domestic utensils from rust. Stainless steel and rustless iron have been perfected. The former is used not only for table knives, but for fireirons, stair-rod, and other articles of the kind. Rustless iron is employed for making garden tools, fire grates, kitchen utensils, name plates, and blind fittings.

Galvanizing is a protection against rust in certain cases. It is suitable for bolts, chains, and other door and window fittings, as well as for bedstead and other springs, but not for anything that comes into contact with

soap, as it cannot resist the alkalis therein. Gas and electric light fittings, grates and radiators, are among the great number of articles that can be protected from rust by a galvanizing process.

Cleansing Agents. There are various compositions for removing rust, but probably the most generally useful cleansing agent is paraffin. Where the rust has been allowed to eat into the metal some special kind of lubricant may be needed. For example, if the fireirons have got badly rusted, a mixture of two parts of rottenstone and one part of sulphur is generally effective.

A useful method for cleaning up any iron kitchen utensil that has developed rust in the interior is to put potato peelings in it with water and a lump of soda, and boil it up. For a tin kettle or pan that has rusted, a good plan is to boil up borax and water in it and afterwards scour it thoroughly.

Articles that are not in regular use or that have been put away for a time, during the holidays, for instance, should be safeguarded against rust. Many housewives are in the habit of using vaseline for this purpose, others apply lard. An effective preservative can be made with grease and camphor, in the proportion of $\frac{1}{2}$ oz. of the latter to 1 lb. of the former; a little blacklead can be added as colouring. Grates, fire-irons, etc., should be rubbed with this composition, left for 24 hours, and then dried with a cloth. They will be rustproof for some time afterwards.

RUST FUNGI. Roses, carnations, chrysanthemums, and other garden plants are liable to be attacked by rust, a fungoid disease appearing in the form of brownish or deep orange patches. It is very common among wild roses, and its spores are carried to cultivated kinds by wind, insects, and birds.

Leaves and stems of roses are both liable to infection, and infected leaves must be carefully collected and burnt, whilst other parts should be sprayed with a solution of potassium sulphide, 1 oz. to a gallon of water. Other plants may be treated in the same manner. See Rose.

RUSTIC WORK IN GARDEN FURNITURE

The Making of Seats and Other Requisites for Outdoor Use

For the form of craftsmanship, the reader should consult, in addition to the contribution below, the entries on Arch; Pergola; Summer House; Trellis.

Under the heading of rustic work is grouped all that class of work, such as the construction of garden seats, small summer houses, arches, and the like, which is built up by the most simple methods from unhewn timber. The material can be obtained at low cost in country districts, and is variously known as cordwood and poles. The best material is oak, but any of the hardwoods, such as chestnut or hornbeam, answer very well.

Opinions differ as to stripping off the bark, where flowering plants are to be trained over the structure, there is far less risk of harbouring insects if the bark is peeled off. The timber may be varnished or treated with wood preservatives, but many people prefer to retain the natural colour. Rustic work includes decoration with cleft timber, which offers considerable scope to the amateur wood-worker.

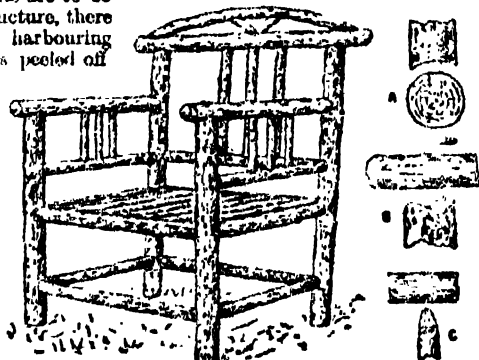
So far as joints are concerned,

these are almost always made with stout nails, either of the French or wire pattern, or of the wrought iron cut class. To ensure firm contact between the joints, both of the meeting surfaces should be slightly axed, to form a more or less flat surface where the parts fit together, as in Fig. 4. It is impossible to get any set design for this class of work, as the material, being in its natural state, will be of quite different shapes.

The timber used may be either the smaller

branches of such trees as oak, the roots of fallen trees, or if straighter wood is required, having at the same time the natural appearance, the branches may be trimmed off the tops of such trees as larch, so as to leave the branch knots sticking out a few inches in a very rough state.

Rustic Armchair. Fig. 1 shows a rustic armchair that is simple to make.



Rustic Work. Fig. 1. Armchair, with details of the principal joints employed in its construction



Fir sapling or oak with the bark removed may be used. The front and back legs may be $2\frac{1}{2}$ in. or 3 in. in diameter; the seat rails, arms, and top back rail about 2 in., other rails $1\frac{1}{2}$ in., and uprights on sides and back from $\frac{3}{4}$ in. to 1 in. The general sizes for the chair are as follows: Width over legs, 2 ft. 3 in.; depth over legs, 1 ft. 10 in.; height to seat, 1 ft. 4 in. or 1 ft. 5 in.; height to arm, 2 ft. 1 in.; height to top back rail, 2 ft. 10 in.; total height to top of back, 3 ft. 2 in.

The principal joints are effected by means of dowels preferably of oak. If we take the fixing of the seat rails to the legs as an example, the ends of the rails are slightly hollowed to fit the leg, as A, Fig. 1. The dowel is then prepared and glued or painted in as indicated by the dotted lines. In the same way the top ends of the legs are hollowed to fit the arms and back rail respectively (see B). The arm is similarly fixed to the back leg.

The narrower rails and the uprights are fixed as at C. The end of the entering part is pared to a blunt point, and then driven tightly home into a hole bored to receive it. Fixing otherwise is done with nails, these as a rule being driven in slantwise to provide a wedge. The seat is made from ten to twelve lengths of material 2 in. to 3 in. wide, semi-circular (or rather less) in section. These are fixed by nailing fillets to the inner faces of the seat rails. Across these fillets the seat laths, after being cut and trimmed to fit, are laid and nailed. Care should be taken to drive all nails well home. The back has a slight rake, so as to make the lean more comfortable.

Garden Seat. A strong rustic garden seat, such as that illustrated in Fig. 2, may be constructed in the following way. One end is first made up from three pieces of the wood, with the piece for the back, about 9 to 12 in. longer than the piece intended for the front, which should be about 2 ft. long. These two pieces are joined together by the third or arm rest piece, using stout nails, and two cross members fixed in the shape of the letter X between them as a support. The other end is constructed in the same manner.

The two ends are joined together by longer pieces, about 4 ft. in length, one to the front legs and one to the back. These should be straight poles, or ordinary prepared wood of sufficient strength, as they represent the framework of the seat. Other lengths of rustic material are arranged as cross-braces between rails and front and rear legs, so as to hold them firmly together. The next step is to prepare the back, the top rail of which may be formed of a single piece of wood, or of two or

more pieces, as illustrated in Fig. 2. The exact construction will be governed by the material at hand. In any case means should be provided to support the back, so that it will be firm and rigid. The space between the top rail and the rear seat rail should be filled in with odd pieces of rustic material, arranging them so as to form rough diamond shaped openings, and nailing

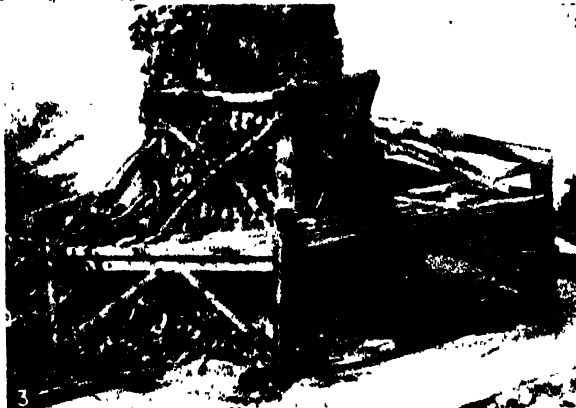
length, set in position, and the arm-rest pieces fixed between the back uprights and the tops of the legs. The whole is rigidly braced with cross pieces between the supporting legs, and the rails and supports for the seat. The seat itself may be made in a similar manner to that described above.

Joints in Rustic Work. In constructional work (e.g. the building of a summer house or the erection of a trellis) the important point is to see that the structure is rigid and stable. This is accomplished by diagonal bracing—that is, arranging the timbers more or less in the form of the letter X. The joints are mostly simple butt joints, and are not inherently rigid. To remedy this defect the most practical plan is to cross brace the uprights and horizontal members. The leading methods are described below, and other details will be found in the articles on Arch; Summer House; and Trellis.

Fig. 4 shows the method of axing the joints, that is, roughly flattening one side of each of the two pieces to be jointed, in order that they may fit together more conveniently for nailing.

Fig. 5 shows a good method of making a strong joint for, say, the seat rail to the legs of a chair. It consists of sawing and chiselling out a small piece of the leg in the manner shown, in the requisite position on the leg, and of such width that the rail will fit exactly into it. The joint is secured by means of a nail, or nails, driven through the leg into the top of the rail. The end of the rail should be sawn off as flat as possible.

The method of nailing the cross pieces is illustrated in Fig. 6, which shows a flat iron being held at the back. It is necessary that some means should be provided for the support of the material against the blows of the hammer. In some cases it might be better to use a large hammer as a support, or the head of a small axe, but in general the means provided are governed by the position of the joint to be nailed. If some support is not given, the repeated blows of the hammer may not only cause the jointing pieces of wood to slip about, but might also break some other joint that has already been made. All nails should be driven well home, and if the joints project, these should be clinched and flattened



Rustic Work. Fig. 2. Strong garden seat with three-piece back rail and flat seat of strong battens. Fig. 3. Garden seat of rustic wood built around a tree.

them firmly to the top and seat rail respectively. The flat seat itself is of strong battens fixed to side rails on the legs at either end of the seat.

Fig. 3 shows how a seat can be built around the stem of a tree, so as to make a very pleasant garden seat for the summer time. The seat is supported by three legs, but where it surrounds the tree entirely, more support will be necessary. The legs are cut to the required



Rustic Work. Fig. 4. Axing the joint. Fig. 5. Making a strong joint. Fig. 6. Nailing with flat iron at back for support. Fig. 7. Finishing off ends with spokeshave. Fig. 8. Another finish, with gouge and mallet.

dawn, so that there is no possibility of their catching into and tearing garments.

Two methods by which the ends of the rails and arm rests may be finished are shown in Figs. 7 and 8. In Fig. 7 the edges are being rounded off with a small spokeshave. This has the advantage that the chance of getting splinters in the hands is greatly minimized, and avoids a good deal of damage to the ends as often if the end is knocked, and the edge is still in the rough state, the outside grain is splinted, necessitating the splintered piece being torn right off. In the method shown in Fig. 8 a gouge and mallet are employed and the end worked round as indicated.

RYE: Its Uses. Flour made from rye grain is supposed to contain more gluten than any other flour except wheat. Because of the many diseases that attack rye, this flour is used only to a small extent, but when free from disease, it forms a palatable and nourishing food for those with whom it agrees. With others, however, it sometimes causes stomach trouble and diarrhoea, and a great number of epidemics have been traced to its use. It makes good, if rather coarse, bread, and can also be used instead of flour for making girdle cakes.

RYTOL: The Developer. This is a photographic developer in tablet form which is made by Burroughs, Wellcome & Co., Ltd. It is an all purpose developer of the para-indo-phenol class. It is clean acting and non-staining and needs only to be dissolved in water with a tablet of rytol accelerator.

The tablet form makes it very convenient to store and to take about when developing has to be done on a journey or away from home. For normal dish development rytol is used as follows:

Rytol	accelerator	..	..	1 tablet
Water	..	..	..	4 oz

The tablets are broken up in the water with a glass rod, and, if stirred a little, dissolve quickly. Tables for development with rytol as time and temperature, for all brands of plates and films, are given in the Wellcome Photographic Diary. The Watkins development factor for normal contrast at normal strength is 12. See Developing.

SABLE: The Fur. The costly and highly prized fur known as sable is obtained from the animal of the same name, a species that is closely allied to the common marten.

There are several varieties of sable, that known as Russian sable being the most valuable. This is glossy and dark brown in colour, and in the best skins merges into a dim black towards the back. The darker the fur is the more valuable it becomes.

Cheaper kinds of sable are those exported from Canada. These also are thick and soft, but they are of a lighter shade, and are tinged with yellow. Experts are employed to brush the tips of such sable with dye so that they more closely resemble the best Russian variety. See Fur, Kolinski, Marten.

SACCHARIN. Glucidum, or saccharin, is an intensely sweet coal-tar product used instead of sugar by those suffering from diabetes, corpulence, and other affections in which sugar may be injurious. It ranges in sweetness from 300 to 600 times that of cane sugar, but has no nourishing qualities, and is excreted from the body unchanged. See Diet; Sugar.

SACCOLABIUM. The stove epiphytal orchid called saccolabium requires a temperature from 65° to 75°. It may be grown in hanging baskets of bark, attached to blocks of wood, or in pots filled to the rim with coeka, charcoal, and sphagnum moss. Its

growing period is March to November, and resting time November to March. The plant demands a moist atmosphere, and must always be grown near the glass. It should be watered generously from March to September, and moderately afterwards. Propagation is by offsets. See Orchid.

SACHET. The small perfumed cases sold by chemists and used to impart a delicate fragrance to women's clothes are known as sachets. They are less strongly scented than liquid perfumes, but are often more lasting.

Larger sachets are made for holding handkerchiefs, gloves, stockings, etc. They are simply large squares or oblong pieces of wadding, plentifully sprinkled with perfumed powder, covered with fine muslin, and finally sewn into satin or silk coverings and trimmed with embroidery, painting or ribbonwork. The edges may be finished with piping or a cord. Still larger sachets are made in the same way and used as nightdress cases. A long strip of wadding can be perfumed, covered with muslin and used as a lining to a drawer. On it rests the underwear, which absorbs the faint perfume, and can be protected with a similar covering sachet to keep out the dust. See Lavender; Night Wear Case; Pot Pourri.

SACK: A Spanish Wine. The old name of a dry Spanish wine resembling sherry was sack. The following is Sir Walter Raleigh's recipe for sack posset: Boil together $\frac{1}{2}$ pint of sherry and $\frac{1}{2}$ pint of ale and add gradually a quart of boiling cream or milk. Sweeten the mixture well, and flavour with grated nutmeg. Put into a heated dish, cover and stand by the fire for two or three hours.

SADDLE: For a Horse. A good fitting saddle is just as important as a good fitting pair of boots. A badly fitting saddle is one of the most fruitful causes of injury to the back and withers of the horse and may either temporarily or permanently disable the animal. No matter what the shape of a horse may be the saddle has always a tendency to work forward, so that unless it fits properly, bruised withers and galls will result. Apart from this, comfort to the horse means comfort to the rider, both of which features are inseparable from a properly fitting saddle.

The rules for saddle fitting may be summarized as follows: There must be no pressure on the withers. There must be no pressure on the central line of the back. Shoulder-blade movement must be absolutely free. There must be no pressure on the loins. The ribs must bear the weight in an evenly distributed manner, extending from the play of the shoulders to the last rib on either side.

In buying saddles many persons purchase second-hand ones, preferring one that has been used to a new one. The best saddlers have generally a number of these on sale, and are quite willing to fit them, or allow approval to approved clients. Good second-hand saddles are always in demand, and can be bought for about 75 per cent. of their original cost, in some cases for less than half.

If it is a second-hand saddle that is desired, particular care should be taken to note the condition of the leather, the stuffing, the strength of the saddle-tree, the breadth and width of the arches, and the quality of the leather. Second-hand saddles vary to a large

extent, everything depending upon the make and the care which has been bestowed upon them. The life of a saddle is increased many years by proper attention, whereas it is decreased through careless treatment. It is a safe plan never to buy a saddle that has been either patched up, restitched, or repadded.

A saddle suitable for a hunter or hack should be made of the choicest pigskin, light in weight, and have a framework of steel and wood, with hair stuffings. The side-saddle, though still used by horsewomen, has been largely superseded by the seat astride.

Directly a saddle is taken off the horse's back it should be exposed to the air in order to dry the lining, after removing the girths and stirrup leathers, and sponging the surface of the leather with warm water to remove mud stains.

In saddle-rooms airy and wooden horses are kept for this purpose. As soon as the saddle is dry, the lining should be brushed with a stiff brush, and the leather treated with a good saddle soap, polished with a brush and rubber.

The saddle should be kept covered up when not in use, and never left exposed to the emanations arising through decomposing organic matter from the stable, as nothing tends more towards rotting the leather. It is a great mistake to have saddle brackets placed in stables, and what applies to the saddle is equally applicable to harness. Another matter is to avoid the use of too much water. A sponge and chamois leather will do all that is necessary towards the removal of mud and mud stains. In summer the saddle should always be aired in the open, as artificial heat destroys the vitality of leather. See Harness; Horse; Riding, etc.

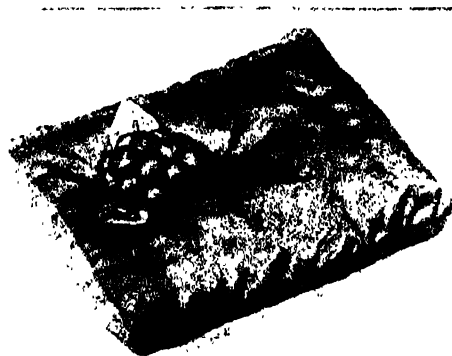
SADDLE: Of Mutton. This is a large joint consisting of the double loin from both sides of the sheep. The usual method of cooking is roasting as described under the general article on Mutton. See Carving.

SAFE: For the Home. A safe is a strongly built container, usually of steel or iron, in which money and other valuables can be kept secure. In its construction special devices have been introduced in order to guard against the risk of fire and the attacks of burglars. There are various patterns, some of which are suitable for the home, and a few of these are here described.

In one form the safe is very small, and equal in dimensions to an ordinary brick, being built into the wall in the place of a stretcher, that is, a brick which is laid lengthwise to the direction of the brickwork of the wall. The brick is removed from the wall and the safe built into the cavity. Such a safe is located usually behind a picture or other article of furniture to conceal its whereabouts. A hiding place for a small safe or a strong box can be contrived beneath the floor boards, locating it in a situation where it is continually concealed by a carpet.

The safe illustrated is 14 in. thick at the thinnest part, has a drill-proof door, drill-proof rivets, and two gunpowder-proof non-breakable locks. The internal arrangement usually comprises shelf and drawers, the latter being provided with locks and keys.

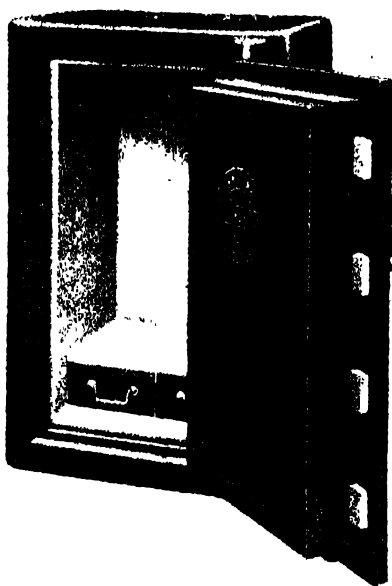
Home Safes. To assist saving, a home safe can be obtained from all post offices where banking business is transacted. This safe is a locked box, the key of which is kept by the



Sachet. Glove sachet made of coloured taffeta and trimmed with padded silk front

post office authorities, who will open it when it is brought in and place its contents to the credit of the depositor's account. There is no charge for a safe, but at least 2s. must be deposited in it when it is taken out.

Home safes are also supplied by the banks. From the Midland Bank, for example, a strong box of convenient size, with separate compartments for coins of various denominations and for notes, can be obtained on opening a home safe deposit account with an initial deposit of 1s. or more. The key is kept by the bank and the contents are credited to the holder's account from time to time as the safe is brought to the bank and captured.



Safe. Small type suitable for home use. It is fitted with a shelf and drawers.
Courtesy of John Tann Ltd.

SAFE LIGHT. This is a somewhat loose term used to indicate a light by which sensitive plates or papers may safely be developed. Actually no light is completely safe. If a plate is left near an ordinary dark-room lamp with a lamp cap on for a min., and is then developed, an image of the lamp will be seen on the plate.

The guiding rule in dark room illumination is to have sufficient light to work in comfort without allowing any direct rays from the lamp to fall on the plate or film, and to avoid exposing the plate or film even to reflected light if better than is absolutely necessary.

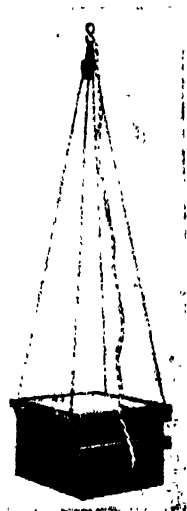
Thus, during development the development can be kept covered with a card, lifting it only for a few seconds when examination of the plate is necessary.

A large light in the dark room is better than a small lamp. With the large lamp properly arranged there is ample light to see all objects in the dark room, and to work in comfort, while the plates, if kept out of the direct rays of the light, are much less likely to be fogged than if they are held close up to a small so-called ruby lamp, which may be, actually, extremely unsatisfactory, and yet leaves the dark room in an uncomfortable, murky gloom.

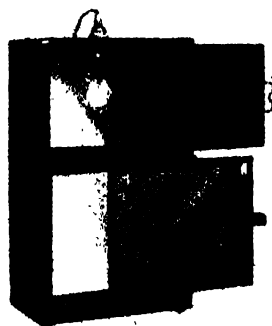
The ideal arrangement is a ceiling reflector lamp, such as that shown in Fig. 1, by which the whole of the dark room is illuminated, but with diffused light, so that no direct rays can reach plate or film. The screen should be about 10 in. by 8 in.

The Wratten dark room lamp (Fig. 2) made by the Kodak Co. for gas, oil, or electric light, takes screens 7 in. by 5 in. and 10 in. by 8 in. These screens are interchangeable according to the work in hand.

The screens for these lamps are sold separately as safe lights, so that the amateur may adapt an old lamp if sufficiently large, or may contrive one for himself out of wood if for electric light, or tin if for gas or oil, the whole of the interior being painted dead white.



Safe Light. Fig. 1. Hanging lamp with top screen for ceiling reflection. Fig. 2. Type with lamp inserted at top and light reflected through coloured screen at bottom.
Courtesy of Kodak, Ltd.



Safe light screens are of different colours according to the purpose for which they are required; pale yellow, for gaslight papers; orange, for bromide papers; red, for ordinary plates and films, deep red, for fast ordinary and orthochromatic plates; green, of various shades, for very fast orthochromatic and most panchromatic plates.

A fairly simple and satisfactory form of red light is made by placing a small electric light in a red liquid. Dissolve 100 gr. of eosin dye and 1 oz. of potassium bichromate in hot water, using just sufficient water to dissolve all but a small portion of the dye. It is essential that the solution

should be filtered before use.

A small lamp, such as a pocket flashlight bulb or a motor headlight bulb, should be used, care being taken to protect the holder and the wire from contact with the solution. Holder and wire may be covered with insulating tape coated over, after it is in place, with Chatillon's compound. A wide-necked bottle is filled just below the neck with the solution, and the bulb inserted, the wire being led through the cork. This will be a safe light for all ordinary plates, but not for panchromatic plates and films. See Dark Room: Developing.

SAFFRON: In the Garden. In the garden this is *Crocus sativus*. In its cultivated form it provides the saffron of commerce, a colouring matter obtained from its dried stigmas. It flowers in autumn and should be planted in August and will thrive in ordinary well drained soil. See *Crocus*, Meadow Saffron.

SAFFRON: Uses in Cookery. The yellow colouring and flavoring agent known as saffron is manufactured into saffron water or essence, which can be bought in small bottles from most grocery stores, and is used to flavour and colour cakes and various other dishes. It also forms an important ingredient in the making of confectionery and certain kinds of liquors. Saffron has stimulative properties and, if used judiciously, is a valuable aid to digestion.

Saffron Bun. The necessary flavouring for saffron buns can be obtained by boiling 1 tablespoonful saffron in $\frac{1}{2}$ gill water to which

a pinch of salt has been added. The following day, sieve 1 lb. flour into a basin, rub in 3 oz. margarine or butter, and then add, and mix in well 3 oz. currants, 1 oz. candied peel cut into small pieces, and 2 oz. sugar.

Put $\frac{1}{2}$ oz. yeast into a small warmed basin with $\frac{1}{2}$ teasp. spoonful

castor sugar, mix them till a bead is formed, and then add $1\frac{1}{2}$ gills hot milk mixed with the prepared saffron water. Strain the whole into a well made in the centre of the flour, etc., mix all to a rather slack dough, then cover the basin and leave its contents to rise in a warm place for about 1½ hours.

Turn the dough on to a floured board, knead it for a few minutes and then divide it into small equal portions. Mould each to a smooth bun shape, and place them on a greased baking sheet, leaving a space between each to allow for them to rise. Let them stand in a warm place for another 20 or 30 min., use more flour to mould, then bake them for about 15 min. in a hot oven.

When cooked, brush them over with a glaze made of $\frac{1}{2}$ gill milk and 1 dessertspoonful castor sugar, and return them to the oven for a few seconds so that they may dry.

Saffron Cake. The use of the saffron not only flavours the cake, but gives it a bright yellow colour. Prepare the saffron water as for saffron bun. Make the cake according to the recipe given for plum cake in p. 172. Saffron water being used to moisten the dry ingredients mixed with an equal quantity of milk to make rather less than $\frac{1}{2}$ gill of liquid in all.

Saffron Tea. This is made by infusing a pinch of dried saffron in a gill of hot water for about 10 min., then straining it out and adding $\frac{1}{2}$ gill or more brandy and sugar to taste. The tea may be served either hot or cold.

SAGE. Chiefly used in cookery for flavouring and seasoning, sage is a hardy herb. The seed should be sown in a sunny, well



Sage. Leaves of the fragrant tonic herb

drained soil in early spring, and the young plants shifted as soon as they are large enough to handle. Stock is best increased by slips or cuttings, which may be taken annually. When the shoots are ready to cut they should be tied up in bunches and hung, foliage downwards, in a dry loft or shed. The leaves may be rolled off when quite crisp and stored in dry, airtight bottles.

Sage Gargle. A good gargle can be made by boiling $\frac{1}{2}$ pint sage leaves in 1 pint water until the liquid is reduced by one-half. While boiling keep the pan covered, only removing the lid to observe the reduction of the liquor. Then strain it and mix with the liquid an equal quantity of vinegar, port wine, and $1\frac{1}{2}$ oz. honey. Bottle it for use, and warm it when required as a gargle.

Sage Tea. To make sage tea, put into a jug $\frac{1}{2}$ oz. fresh sage leaves, pour upon them 1 pint

boiling water. Cover the vessel over and infuse it for 10 min., then strain the tea and take as a tonic dose from $\frac{1}{4}$ to 1 wineglassful.

Sage Wine. To make 2 gallons of this medicinal wine $\frac{1}{2}$ peck sage leaves will be needed, 2 gallons water, the whites of 2 eggs 8 lb. raisins, 2 lemons, 1 orange, $\frac{1}{2}$ pint brandy $\frac{1}{2}$ oz. isinglass, 3 oz. sugar candy (brown). Pick the sage leaves, using either red or green. Stone the raisins and cut them small. Loose dessert raisins are best.

Boil 1 gallon water with the whites of the eggs, and pour it over the sage leaves, which should be put into a wooden bowl. Put the raisins into another bowl with the rinds of the lemons and orange pared thin, also the strained juice, and pour over these the remainder of the water, which should have been boiled up and allowed to become lukewarm. Cover over each vessel and leave till next day, stirring both occasionally.

After leaving them the required time, mix both liquids together, and let them stand again, but this time for 6 days. Then strain into a cask or stone jar, previously putting into it the sugar candy. Let the wine work and keep the vessel full while the fermentation takes place.

When the wine ceases to work add the isinglass and brandy and bung it up. Let it stand 10 weeks, then if not clear pour it off, strain, and return to the cask or jar with another $\frac{1}{2}$ oz. isinglass. Keep it twelve months before bottling.

SAGINA. This is a close-growing carpet plant, known as pearlwort, which is sometimes used as a groundwork or an edging to flower borders. It bears tiny white flowers in summer. The yellow-leaved variety, *var. aurea*, is a favourite plant for use in carpet bedding designs. Ordinary soil suits it and propagation is by division.

SAGITTARIA. The handsome water plant known as arrow-head or sagittaria is about 2 ft. in height, with spiky leaves and white flowers. The double-flowered variety is finer. It is in blossom in early summer, and should be planted in water about 10 in. deep. When first established the roots may be sunk in a basket, after the manner of planting water lilies. Propagation is by seeds sown in spring-time, or by division of the roots of the plants at that period. See Water Lily.

SAGO. The best kinds of sago, which is prepared from the pith of a species of palm, are known as pearl sago, and are sold in small and large grains. Sago is fairly nourishing, and its importance as a food may be compared with that of rice or potatoes. Its value for invalids consists mainly in its soothing effect on the stomach.

To thicken soup with sago, sprinkle it into the soup while boiling and cook it about 20 min., stirring often to prevent it from becoming lumpy or sinking in the pan and browning. Use 2 oz. sago to each quart of soup, and cook the grain thoroughly.

Sago Drink. Sago makes excellent invalid drinks and can be prepared in two ways. One method consists of putting 1 oz. rather large pearl sago into a saucepan with 1 pint cold water. Place the pan back from the fire, but in a warm position, and let the grain soak for 2 hours, then bring it to the boil and simmer for 20 min., stirring frequently. Add 1 wineglassful port wine, a little grated nutmeg, and sugar to taste, and serve hot. For the second method, soak 1 oz. small sago in cold water for 1 hour, strain off the water, and add $\frac{1}{4}$ pints new milk. Stir this over the fire until the food value of the sago is quite incorporated with the milk, add a little grated nutmeg, and sweeten to taste. Strain off the milk from the sago just before the latter has softened, sweeten and flavour it, and leave it to cool. It should be skimmed before serving.

Sago Mould. To make this, boil up 1 pint milk in a pan with a few pieces of thinly cut lemon rind, then sprinkle in 3 oz. washed sago, and simmer the whole gently until the mixture thickens and the sago is cooked.

Keep it well stirred, take out the lemon rind, and let the mixture cool slightly at the side of the stove before adding 1 oz. margarine, $\frac{1}{2}$ dessertspoonful sugar, and a beaten egg. Stir all these over gentle heat for a few minutes so that the egg may cook, then pour them into a wet mould and leave them to set. Serve the mould either with jam or stewed fruit.

Sago Pudding. To make a plain sago pudding soak 3 oz. small sago in cold water for 1 hour. Meanwhile boil up slowly 14 pints milk, adding 1 oz. sugar and a strip of lemon rind. Pour off the water from the sago and stir it by degrees into the boiling milk; let all boil slowly for 15 min., taking care to stir frequently. Remove the lemon peel, pour the mixture into a greased pie-dish, and bake it in a slow oven for about $\frac{1}{2}$ hour. Always boil the sago with the milk before baking the pudding; if this is not done the grain is liable to sink in a mass to the bottom of the pie-dish.

A richer pudding is made by beating 2 eggs with $\frac{1}{2}$ oz. sugar and adding them to the sago and milk before turning it into the pie-dish. Omit the 1 oz. sugar given in the previous recipe. Butter the pie-dish for the richer pudding, and scatter 2 or 3 small pieces of butter on the top when the pudding is ready for the oven; also dust with castor sugar. Bake about 20 min.

Sago and apples together make another good pudding. Prepare it by soaking 2 to 3 oz. washed sago overnight in a pint of water, and the following day add $\frac{1}{2}$ lb. sugar and 5 or 6 moderate sized apples, peeled, cored, and finely chopped. Mix these well, then turn them into a greased pie-dish and bake them in a moderate oven for about 1 hour. The pudding may be served either hot or cold, and with cream or custard.

SAILCLOTH. This fabric is a sort of duck made in cotton, linen or hemp, and in several degrees of coarseness and heaviness. Very stout cloths for outdoor structural uses or making hammocks and stretchers for deck chairs, can be got from firms manufacturing window blinds for shop-fronts. The choice should be guided by the purpose in view. See Canvas.

ST. BERNARD. This dog may be either rough-coated or smooth, points otherwise being the same. They should have enormous bone, with absolutely straight front legs, and no inclination to be cow-hocked behind. The latter, however, is not always achieved, as heavy dogs are very troublesome to rear straight. The richer the colour the better. It may be red, orange, various shades of brindle, or white with patches of either. Importance is attached to the distribution of markings, which include white muzzle, white blaze up face, white collar round the neck, and white on chest, forelegs, feet, and end of



St. Bernard. Champion of this handsome breed
Photo, Theo. Fall

tail. There should be black shadings in face and ears. See Dog, Kennel.

ST. BERNARD'S LILY. The popular name of a hardy herbaceous perennial (*Anthericum liliago*) in St. Bernard's lily. It grows 2 ft. high, has narrow leaves and bears white flowers in summer.

St. Bruno's Lily (*Anthericum liliastrium*) is 3 ft. high and has large, white, funnel-shaped, lily-like flowers.

If the soil is clayey, test-mould and sand should be dug in freely before planting. Propagation is by division in spring.

ST. CLOUD WARE. The soft-paste porcelain made at St. Cloud, near Paris, at the end of the 17th century represents the oldest chinaware produced in Europe, and it was the



St. Cloud Ware. Pastille burner in modelled white porcelain; early 18th century. Height 3 in.
(By permission of the Director, Victoria & Albert Museum, Kensington)

forerunner of Sèvres. The fine regular paste can be recognized by its yellowish tinge, and the forms, which imitated those of China and Japan, were decorated with simple designs in a rich blue outlined in black, and heightened by a brilliant glaze. The factory was closed in 1773.

There is an ample supply of white pieces with modelled ornament, in the form of cups and saucers, jugs, flower-pots, statuettes and grotesque figures. A Chinese pattern especially favoured for reproduction was a white porcelain with primus blossoms in relief. In painted ware the underglaze-blue decoration prevails, but there are also pieces with red, purple, and yellow enamel. See Sèvres.

ST. DABEOC'S HEATH. A beautiful hardy heath (*Daboecia polifolia*) which grows wild in parts of Ireland and is often called Irish heather. It is about 12 in. high and bears urn-shaped reddish purple flowers in late summer; the white variety, *alba*, is very pretty. This heather should be planted in lime-free loamy soil: peat may be added with advantage.

ST. JOHN'S WORT. A group of hardy flowering shrubs and plants (*Hypericum*) of considerable value in the garden. One of the most useful of all is *Hypericum calycinum* (Rose of Sharon); it thrives in shady places and bears large yellow flowers in summer; it should be cut down each spring.

Androsæmum, 18 in., yellow flowers and black fruits, and *moerhousianum*, 12 in., are other good kinds. The best of all the shrubby species is *Henryi*, 2 ft. high. *Coris* is a charming little plant for light soil in the rock

garden. All have yellow flowers and thrive in ordinary soil. The shrubby kinds are increased by cuttings in a frame in summer, the others by division in spring.

St. Joseph's Lily. This is one of several names given to the Madonna lily (*Lilium candidum*). See Lily.

ST. JULIEN : The Wine. One of the best known brands of French claret is produced in the St. Julien district in the Médoc. The name is often applied loosely to cheap clarets. The higher-class St. Julien growths are of deeper colour and greater body and variety than the more delicate products of Latour and Lafite. The bouquet closely resembles the raspberry.

ST. VITUS'S DANCE. St. Vitus's dance, or chorea, is a nervous disease of young children which is much more common in

girls than in boys. It may first be noticed about the age of 10 and causes the child unconsciously to jerk the hands or limbs about, twist the head, or pull faces. Instead of walking normally, the child's gait becomes a series of jerky, irregular movements. An inherited nervous disposition, debility, fright, or precociousness of mind are predisposing causes of the complaint.

A child suffering from chorea should be placed at once under medical care, if for no other reason than that it is liable to or may be actually suffering from rheumatic disease of the heart. Rest in bed may be necessary at the beginning, with a liberal diet of milk, eggs, and soups. Except in severe cases the symptoms pass off during sleep. When the child is allowed up, and particularly when it goes out of doors, care should be taken to protect it from the teasing of other children.

Salad Dressings. The dressing should not be added to the salad until it is ready to serve. A good way with a green salad is to place the made dressing in the bottom of the bowl, reserving the portions of the salad to be used as garnishes, put the other ingredients into the dressing and mix thoroughly. A simple French dressing is served with salads which accompany game, poultry, etc., but a mayonnaise or thickened dressing is usually best for those served as a separate course, with the exception of a salad composed entirely of fruit. Fruits such as bananas, apples, oranges, pineapple and chopped or ground nuts are now introduced into green salads and dressed with mayonnaise. The best oil and vinegar should be used for dressings. Rancid oil or malt vinegar completely ruin the flavour. Lemon juice may be substituted for vinegar, and cream or unsweetened condensed milk is an excellent addition to a thick dressing. Directions for making a mayonnaise dressing are given in page 768.

A French dressing for the lettuce and endive salad to accompany poultry, etc., is made by mixing 3 parts best salad oil with 1 part white wine vinegar. The lettuce leaves are dried put into a basin, seasoned with salt and pepper, and equal parts of chopped tarragon leaves, chervil, parsley and chives (or onion) are scattered over them. The salad is carefully lifted out when required, leaving any moisture that may have drained from the leaves in the bottom of the basin and placed in the mixed oil and vinegar in the salad bowl. The leaves are turned about gently in the dressing until thoroughly coated and served at once on side plates. The salad bowl may be rubbed round with a crust of bread containing a clove of garlic.

A dressing for a vegetable salad may be made of 3 tablespoonfuls salad oil, 1 teaspoonful tarragon vinegar, 2 dessertspoonfuls white vinegar, salt, pepper, $\frac{1}{2}$ teaspoonful made mustard. The same quantity of lemon juice may be substituted for vinegar where the latter is not liked and $\frac{1}{4}$ teaspoonful castor sugar may be added. Put the mustard, salt and pepper into a basin and gradually stir in the oil; then add the vinegar, mixing thoroughly.

Salad Cream. A very good recipe for a salad cream which can be made in large quantities and stored in bottles is as follows: The ingredients consist of the yolks of 6 hard-boiled eggs, 6 oz. butter, 2 oz. castor sugar, $\frac{1}{2}$ oz. salt, 1 oz. dry mustard, cayenne pepper to taste, $\frac{1}{2}$ pint cream, $\frac{1}{2}$ pint salad oil, $1\frac{1}{2}$ gills white wine vinegar, 4 tablespoonfuls tarragon, chervil, and tomato vinegar mixed together, 2 tablespoonfuls Worcester sauce, and 2 teaspoonfuls anchovy sauce.

Rub the eggs through a wire sieve, then pound them in a mortar till a perfectly smooth paste is obtained. Work the butter and sugar together until they are very light and creamy; in cold weather the butter may be

SALADS AND ACCESSORIES TO SALAD MAKING

Many Dainty Ways of Serving these Health-giving Dishes

This article deals with a selection of appetizing salads, which in their various set ones find a place in the menu all the year round. See also Fruit Salad. Hors d'Oeuvres: Mayonnaise: Olive, Supper. Tarragon: Vinegar.

Salads may be divided into plain salads which accompany some dish and skilfully composed salads which form a course in themselves. The former kind are made of salad herbs and vegetables, either raw or cooked and allowed to become cold, with the occasional inclusion of certain fruits. The latter kind contains among other salad ingredients nuts, eggs, fish, cheese, meat, game or poultry; or are composed entirely of mixed fruits and served as the sweet course at luncheon or dinner. The secret of success lies in the proper blending of ingredients and the cool, inviting appearance of the finished salad. This may be served in a glass, china or pottery bowl, or individual portions may be placed in salad saucers, or on glass plates. Fig. 1 illustrates a plain salad appetizingly arranged in a cut glass bowl, with glass servers, oil and vinegar bottles and salad plate. Fruit salads may be served either in a fruit set or in sundae glasses.

In making salads the first essential is to see that the ingredients are perfectly fresh. If tinned goods are used, they should be of first class quality and removed from the tin immediately after opening it. In warm weather salad herbs, fruits, etc., gain added crispness by being kept for a few hours in a refrigerator. When this is not possible a wire vegetable rack placed in an airy larder is the best receptacle to hold such items as endives, bunches of watercress, spring onions, radishes and lettuce.

Salad vegetables should be handled as little as possible, but must be washed thoroughly in cold salted water. Watercress requires cleansing in several waters, mustard and cress should have the small black seeds removed. Endive and lettuce are prepared by cutting off the root and any outer leaves unfit for use; the smallest leaves and heart should be set aside for garnishing the top of the salad. Outer leaves of lettuces should be torn in pieces and not cut. The roots of spring onions should be cut off and the tops trimmed before washing, and afterwards the outer skins removed. Radishes may be sliced, but if small, round, and of bright colour, they form an effective garnish when left whole.

Aids to Preparation. Wire baskets are sold for straining the water out of lettuces, etc., after washing them. A clean cloth should be used where a basket is not available, held by the corners and the salad shaken gently in it until the ingredients are dry. Moisture left on lettuce and other vegetables ruins the salad and prevents the dressing from properly adhering to them. The strainer illustrated in page 663 can be used as a salad basket, and another excellent device shown in the same page is the tomato slicer. A cutter with which cucumbers can be finely



Salad. Fig. 1. Plain salad arranged in a cut-glass bowl with glass accessories.

sliced is illustrated in Fig. 2. It is well worth purchasing, and various stainless steel knives are also obtainable which are valuable aids to preparing ingredients. One with a long flexible blade is particularly useful for slicing beetroot. An ingenious egg cutter is shown in Fig. 3.

It should be noted that when butter is mentioned in this article, margarine can be used as a substitute.



Fig. 2. Cucumber slicer with which cucumbers can be thinly and evenly cut.

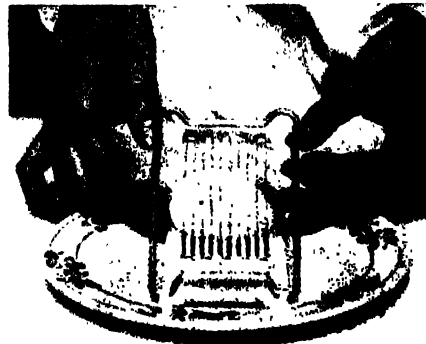


Fig. 3. Aluminium egg cutter with which hard-boiled eggs may be sliced for garnishing salads.

just melted, but it must not be allowed to oil, or the mixture will curdle. Add to the eggs the butter, sugar, salt, mustard, and pepper, and thoroughly incorporate them, then by degrees moisten the paste formed with the cream and, when that is mixed, work in the sauces. Last of all the ingredients, put in the oil and then the vinegar.

The oil must be mixed in first very carefully and a few drops at a time. When thoroughly incorporated add the vinegar. It is best to use the mortar entirely for mixing, as it prevents waste of ingredients. If by any chance the salad cream curdles, it can be restored by placing the mortar in a pan of hot water and stirring till smooth again.

A simple dressing may be made by passing the yolk of a hard-boiled egg through a sieve, beating it fine with a fork in a basin, then adding 1 saltspoonful dry mustard, $\frac{1}{2}$ saltspoonful salt, 1 teaspoonful castor sugar, 1 tablespoonful salad oil, 1 tablespoonful vinegar, and cayenne pepper to taste.

Brazilian Salad. This salad may be served either as hors d'oeuvres or as a separate luncheon course. The ingredients are white grapes, apples, celery, Brazil nuts and lettuce. Skin and pip the grapes, chop the apples, celery and nuts finely, mix with salad cream and place on crisp lettuce leaves either in a bowl or on small plates.

Butter Bean Salad. Soak and boil $\frac{1}{2}$ lb. butter beans until tender. Strain away the liquid. Add a little butter and seasoning to taste and leave the beans to get cold. Mix with mayonnaise or thick salad dressing and garnish with half slices of beetroots, strips of pimiento and finely-chopped parsley.

Carrot Salad. Raw carrot possesses dietetic value and a good luncheon salad may be made by grating enough carrot to fill a breakfastcup, sprinkling it with chopped parsley, a small piece of grated lemon rind, a dusting of pepper, salt and castor sugar. Add a little oil and lemon juice, just sufficient to moisten, and mix all together. Arrange small lettuce leaves lightly coated with the dressing round the salad, and garnish with freshly grated carrot and pieces of olive.

Cauliflower Salad. An excellent winter salad is made with cauliflower. Divide one large cold-boiled cauliflower into sprigs. Sprinkle them with salt and pepper, and heap them up neatly in a salad bowl. Cut two tomatoes in slices and arrange them as a border round, sprinkling them with a little chopped parsley. Four about $\frac{1}{2}$ gill mayonnaise sauce or any other good salad-dressing over the cauliflower, and serve.

Slices of beetroots which have been dipped in vinegar may be used with or instead of tomatoes.

Celery Salad. Equal quantities of raw apple and celery are cut into small pieces, placed in a bowl, and covered with mayonnaise sauce. A border of sliced tomato or beetroots may be added to this dish, which must not be prepared too long before it is eaten, in case the apple should become discoloured.

Another celery salad which is excellent with cold pork, goose or chicken is made of sliced celery, beetroots and potatoes and chopped nuts. Cold cooked chestnuts may be used instead of the diced potato.

Cheese Salad. Cream cheese is liked by most people as a luncheon salad ingredient, but any soft cheese may be used or a cheese-cake may be prepared. This is made from 2 $\frac{1}{2}$ oz. dry cheese, $\frac{1}{2}$ teaspoonful each made mustard and salad oil, salt and pepper to taste and enough vinegar to bind the whole into a paste. Grate the cheese and mix with all the other ingredients until the paste is smooth. Serve small portions on a green salad previously prepared with French dressing.

When using a cream or soft cheese cut it into rounds, dip lettuce leaves in French dressing and arrange round the bowl, place the cheese on top and garnish each piece with capers. A layer of diced apple and celery may be placed at bottom of bowl.

Chicken Salad. This makes an attractive addition to the supper table. To prepare it, cut the remains of a cooked chicken into neat strips and pile them in the centre of a salad dish. Cover these with salad cream or mayonnaise, and a border of lettuce, making a cross with strips of beetroots or anchovy and placing a caper in each of the four divisions.

Another good salad made with the remains of a cold chicken is prepared by removing the bones from a boiled or roast fowl, and cutting the flesh into small pieces. Mix the latter with the shredded heads of 2 lettuces, add 1 tablespoonful white tarragon vinegar, and season the mixture with pepper and salt. Then pile it high in the centre of a dish, cover it with mayonnaise sauce and garnish it with alternate groups of lettuce leaves, quarters of hard-boiled egg, shredded gherkin, and stoned olives. Endive may also be used as a garnish.

Crab Salad. A good fish salad can be made by chopping up the flesh of a crab, moistening it with a little mayonnaise sauce, and then putting the mixture into 3 or 4 prepared tomatoes. The latter are scalded in boiling water for a couple of minutes, the skins removed, and an incision made in the top of each so that the inside can be scooped out with a small spoon. Sprinkle a little pepper and salt inside the empty tomato cases, and let them drain before filling them with crab. Garnish the salad with lettuce and cress.

Crayfish Salad. An equal quantity of crayfish flesh should be mixed with cold white fish which has been flaked and boned. Layers of lettuce, cress and endive, of fish and of hard-boiled eggs are placed in the bowl, each layer being moistened with salad cream. Sprigs of tarragon and chervil, cut gherkin, and strips of red chilies are used to garnish. Mayonnaise dressing may be used and a salad composed of turbot, halibut or hake without the crayfish can be prepared, and garnished with anchovies.

Egg Salads. Hard-boiled eggs may be cut in half and placed round a shallow glass bowl. In the centre is piled a mixture of diced potatoes and beetroots, seasoned and flavoured with chopped pickles, parsley and onion, and moistened with salad dressing. The eggs may be stuffed with pounded sardines and served on lettuce with a spoonful of mayonnaise sauce on each half of egg.

Another good egg salad is made of thick slices of hard-boiled eggs. An extra egg is boiled for garnishing and the yolk and white of this are separated; rub the yolk through a wire sieve, and chop up the white finely. Whip 3 tablespoonfuls cream until it just hangs on the whisk, stir 3 tablespoonfuls mayonnaise sauce into it, and season the mixture carefully.

Put a layer of crisp clean lettuce in the bottom of the salad bowl, then one of egg, next of cold cooked macaroni cut into pieces about 1 in. long, then a sprinkling of chopped celery and parsley, and a little dressing.

Continue these layers until the dish is full, arranging lettuce on top. Garnish with the sieved yolk and chopped white of egg.

Lettuce and Fruit Salad. The ingredients are, 1 grape fruit, $\frac{1}{2}$ cupful chopped nuts, 1 cupful white grapes, 2 oranges, 2 tomatoes, 1 lettuce. Peel the grape fruit and oranges and divide into sections, skin and remove pips. Also skin and remove pips from grapes. Place fruit and nuts on top of lettuce, cover with mayonnaise and border with tomato slices. Garnish with a few grapes.

Lobster Salad.

To make a lobster salad, take the meat from a lobster, cut it into pieces of a convenient size, and season these slightly with salt, vinegar, and pepper. Shred some inner leaves of lettuce into the bottom of a salad bowl, cover it with a layer of lobster and sliced cucumber, and cover again with lettuce. Continue with these

layers until the salad is complete, and decorate the top with slices of egg, tomato, or beetroots. Just before serving pour over some mayonnaise sauce and add a sprinkling of powdered coral.

Orange Salad. A salad that goes well with roast meats, or accompanies wild duck, is made from a small cucumber, sweet oranges and chopped nuts. Most of the cucumber should be peeled and soaked for an hour in cold water before being cut into very thin slices. Prepare the oranges, removing all pips and pith. Arrange on cucumber slices and cover with salad cream, garnishing with the nuts and a border of very thinly cut unpeeled cucumber slices.

A good orange salad can be made by mixing the prepared orange quarters with chopped potatoes, apple and olives. The dressing for this salad is made of oil and orange juice, pepper and salt, and the salad is served on lettuce leaves, or in half orange skins placed in grape fruit glasses.

Prawn Salad. Take 1 pint shelled prawns, and sprinkle them with French dressing. Wash 2 moderate sized cabbage lettuces, and pull the leaves into small pieces. Put a layer of lettuce in the dish, cover it with prawns, then pour over it some mayonnaise sauce. Add another layer of lettuce and prawns, and continue until the bowl is full. Mayonnaise sauce should cover the whole. The top should now be decorated with slices of tomato, cucumber, and hard-boiled egg, sprigs of cress, etc.

Salmon Salad. To prepare, take out the bones, break the fish into flakes with a fork and pile it high in a salad bowl on a bed of green salad.

Pour over it some mayonnaise or salad dressing and leave it in a cool place for a little while before serving it; garnish with some sliced hard-boiled egg, a few crisp lettuce leaves, some cress, sliced gherkin and strips of pimiento.

Sardine Salad. This salad is best served in individual portions. To prepare it, put a layer of thinly sliced celery in the bottom of each bowl, cover it with a little boiled and finely chopped onion, and then add a layer of sardines, skinned, boned, and cut into small pieces.

Cover this with some more celery, pour over it a little oil and vinegar dressing, and finally put on a layer of sieved hard-boiled



Salad. Chicken salad, made with lettuce, eggs, olives, gherkins, and cold roast chicken

egg. Coralline pepper makes a good garnish for these salads.

Russian Salad. To make this salad, take 1 lb. mixed cooked vegetables such as carrot, turnip, peas, French beans, potato and beetroot, and cut them into dice. Arrange them neatly in a glass salad bowl, adding a little cucumber and celery if liked, dress them with salad dressing made with cream or condensed milk instead of oil, and garnish with a border of sliced tomato and chopped celery.

If preferred, a few sardines or anchovies boned, tailed and cut into halves may be placed on top of the vegetables. The chopped yolk and white of a hard boiled egg may then be used as a suitable garnish.

Another variety of Russian salad is made by arranging the flaked remains of any cooked white fish in a salad bowl, and covering the top with strips of anchovy and sardine, and some chopped gherkin, hard boiled egg, and capers. Slice some cold boiled potatoes thickly, place a border of these round the salad, and pour some mayonnaise over the centre.

Turkey Salad. An excellent supper salad is made from pieces of cold turkey, which are cut up and mixed with diced celery and shredded endive and moistened with salad cream. Fresh, crisp lettuce leaves should be placed round the salad and it should be garnished with chopped chestnuts, slices of hard-boiled eggs and gherkin.

Salad Bowl. Because salads are served in different ways, according to individual taste, salad bowls may vary both in size and design. The larger ones, which are intended to hold salad for several persons, are deep bowls of cut or plain glass, pottery, china, or polished wood. They are accompanied by salad servers which consist of a two-pronged fork and a spoon to match the bowl.

Smaller salad bowls, designed to hold just enough for one person, are also made of wood, glass, and china. They are sometimes preferred to the larger kinds, and are always useful on occasions when salad for one is required. Semi-porcelain, wood, glass, and pottery sets are obtainable for fruit salad, comprising a bowl and six individual plates.

SALAD BURNET. The hardy perennial herb, Poterium, or salad burnet, bears leaves used for flavouring salads and soups. It requires a sunny, dry position in ordinary light soil, and must be watered freely in time of drought. It is best planted during early spring in rows 6 in. apart and rows 8 in. asunder, removing flower stems as soon as they appear. Roots should be lifted and replanted every year. Salad burnet is raised from seed sown in shallow drills during April or September.

SAL ALEMROTH. The combination of perchloride of mercury and sal-ammoniac or sal alembroth is a powerful antiseptic which has been used in surgery. Sal alembroth gauze and sal alembroth wool are useful antiseptic dressings for discharging wounds, ulcers, etc. The gauze and wool are usually tinted blue with an aniline dye, which becomes bleached when wet with the discharge.

SAL-AMMONIAC. Ammonium chloride is commonly known as sal-ammoniac. It is a common vapour inhalation in the treatment of chronic catarrhs and inflammations of the throat, larynx, and bronchial tubes.

Sal-ammoniac is used to make the electrolyte in batteries of the Leclanché type. See Ammonia; Battery; Bell.

SALE OF WORK. A sale of work is much the same as a bazaar, though strictly speaking at the former nothing but needlework should be sold. In modern parlance the terms are practically interchangeable. Small sales of work may be held in the home with the aim of collecting money for charities. See Bazaar.

SALES: Advice About. The disposal of goods at reduced prices is known as a sale.

The time and manner of a sale vary according to the method and urgency of disposal, an auction sale being usual when the goods have to be sold without delay. The sale of second-hand goods and many small articles is often effected through the advertisement columns of daily papers.

Special and after season sales are held for clothing and household furniture and requisites. Bargains are often obtainable especially in slightly soiled house linen and blankets, in shoes, gloves, stockings and furs at the better class stores and shops.

SALICIN. A crystalline glucoside obtained from the bark of species of willow and poplar, salicin is used in the treatment of acute rheumatism. In the stomach and bowel it is converted into salicylic acid. Pron. Sale-sin.

SALICYLATE. A salt of salicylic acid is called a salicylate. Those most often used in medicine are sodium salicylate, methyl salicylate or oil of wintergreen, salol or phenyl salicylate, and bismuth salicylate.

SALICYLIC ACID. A colourless, crystalline substance, salicylic acid is found in various plant products, including oil of wintergreen and oil of sweet birch, from which it can be prepared; but it is also prepared synthetically. It is used in treating acute rheumatism, in doses of 5 to 20 grains, but usually sodium salicylate, dose 10 to 30 grains, is preferred.

Excessive dosage with these substances causes symptoms of poisoning, referred to as salicylism, such as fullness in the head, noises in the ears, deafness, dimness of vision, sickness, delirium and cardiac depression. Such symptoms should at once be brought to the notice of the doctor.

Salicylic acid acts as an antiseptic and is sometimes used as such in a lotion. It assists in dissolving out the horny cells of the skin and is used to remove corns and warts and in the treatment of skin diseases in which there is much scaling or thickening. See Aspirin. Wintergreen.

SALINE. Salts of the alkalis and of magnesium are used as purgatives under the name of saline. They include sodium sulphate, Rochelle salt or sodium, and potassium tartrate, sodium phosphate, etc. Epsom salt or magnesium sulphate. The dose varies from $\frac{1}{2}$ to $\frac{1}{4}$ oz. Salts are best administered in warm water just after getting out of bed in the morning. People who take salines habitually ought to take some other purgative, e.g. castor oil, at intervals. See Apéritif, Cathartic.

SALISBURIA. One of the most beautiful of all trees which are hardy in the British Isles. It is popularly called the maidenhair tree, because its leaflets resemble the fronds of the maidenhair fern; its botanical name is Ginkgo biloba (Salisburia adiantifolia). The maidenhair tree is one of a limited number of leaf-losing conifers; it will eventually reach a height of 60 ft. or more, though it is slow growing during its early years. It is of graceful growth, and its fern-like leaves, which turn to pale gold in the autumn, are very beautiful. It thrives in ordinary soil and does well in town or country gardens.

SALIVA. The fluid poured out into the mouth consists of the mixed secretions of the salivary glands. These are the parotid, between the ear and the angle of the jaw, the sub-maxillary, under the horizontal part of the jawbone; and the sub-lingual, under the tongue. The saliva is an alkaline fluid; it lubricates the mouth and food, and digests starch by means of the ferment ptyalin which it contains. Among its various contents are the carbonate and phosphate of lime, which tend to adhere to the teeth and form tartar.

Mumps is an acute infectious disease in which there is inflammation of the parotid glands, and occasionally also of the other two

salivary glands. Any of these glands may suffer from simple inflammation due to exposure to cold or injury, etc. Hot applications to the skin over the gland may give some relief in early stages.

A profuse flow of saliva, referred to as salivation, may arise from dyspepsia, stomatitis, the excessive use of mercury and other drugs, such as arsenic, iodide of potassium, antimony, and tobacco and other causes. The treatment depends on the cause.

SALLY LUNN. A kind of teacake baked in a round cake tin or cake ring is known as a Sally Lunn.

The following is a good recipe. Use 1 lb. flour, $\frac{1}{2}$ teaspoonful salt, a scant $\frac{1}{2}$ oz. yeast, 1 teaspoonful castor sugar, 1 egg, $\frac{1}{2}$ pint sour milk or milk and water, and $\frac{1}{2}$ oz. margarine. Save just sufficient of the egg as an egg wash for the cake when baked. Sift the flour with the salt into a bowl and make a well in the centre, melt the margarine in a pan, add the milk, and bring to the warmth of new milk.

Beat the egg, reserving a little as directed, add to the milk, and warm it sufficiently to take the chill off it. Cream the yeast with the sugar, and gradually mix the milk and egg to it. Turn the liquid into the centre of the flour and work all up into a dough, kneading it smooth.

Have ready four medium-sized tins, warm and grease them. Now divide the dough into four equal portions, work each portion into a smooth round, and lay them in the tins. Place these on a baking sheet, cover them over, and set them to prove in a warm place. When they have risen to double their size, bake them in a good steady oven for 20 to 25 min. Turn the cakes out of the tins on to a cake wire and brush the tops with egg.

Salmi. This term is used in cookery to describe a superior kind of ragout made from game or poultry. See Game.

SALMON. Sometimes called the king of freshwater fish, salmon is, strictly speaking, also a salt fish, for it spends part of the year in the sea and the remainder in rivers. British salmon is considered the best, and is in season from early February to the end of August, but Canadian, Dutch, and other imported salmon can be obtained all the year round.

When buying salmon, select a fish with a small head and tail in proportion to its size, broad, thick shoulders, silvery bright scales, and flesh of a pinky red shade. Salmon may be kept for several days after it is caught so long as it is stored in a cool place, but the fresher it is when cooked, the better.

How to Cook. To boil salmon, remove the fins and gills, scrape the scales and cleanse the fish. Put it into a pan or fish-kettle containing enough boiling salted water to cover it, and let it cook slowly. The time required for cooking depends upon the weight of the fish, 10 min. being allowed for every lb. and 10 min. extra.

Salmon may also be grilled, but it should first be cut into slices about 1 in. thick, wiped with a cloth, and then brushed over with salad oil or melted butter and seasoned to taste. Cook these before a clear fire or under a gas grill for about $\frac{1}{2}$ hour, and serve them with maitre d'hôtel butter, or any suitable sauce may be used.

To fry salmon, cut the fish into slices, wipe them with a cloth, brush them over with beaten egg, and then coat them with bread-crumbs. Melt some fat in a frying-pan, and when it is smoking hot put in the slices, frying them on both sides until they are golden brown in colour. Then drain them on paper and serve them hot with the addition of Hollandaise sauce.

When cooking chilled imported salmon, the flavour is improved if it is allowed to soak for an hour or longer in slightly salted water.

Then dry the fish well, and cook by any of the methods given for fresh salmon.

Smoked salmon, either cooked or in its raw state, is often served as hors d'oeuvre, while a special preparation of it, known as lax, is preserved in oil. Both are cut into thin slices and garnished with herbs or pickles. Tinned salmon makes up into good sandwiches, fish cakes, and various other delicacies.

Salmon Cakes. Tinned salmon may be used to make fish cakes or fritters. Break about half a tinful of salmon into flakes, mix it with $\frac{1}{2}$ lb. boiled rice, and bind the two with the yolk of an egg. Add a little lemon juice and seasoning to taste, and heat the mixture in a pan over the fire. Then spread it on a plate to cool, shape it into round cakes, brush these over with white of egg, coat them with breadcrumbs, and then fry in smoking hot fat.

Salmon Chartreuse. Rinse a plain border mould in cold water and coat it thinly with melted aspic. While it is setting remove the skin and bones from 1 lb. cooked salmon and pound the flesh in a mortar with 6 boned anchovies and the yolks of 3 hard-boiled eggs. When the mixture is smooth, add $\frac{1}{2}$ glass sherry, the juice of $\frac{1}{2}$ lemon; rub the whole through a hair sieve, season it to taste with salt, pepper, cayenne, and a little nutmeg, and then add to it a gill of lightly whisked cream and a little more than $\frac{1}{2}$ pint warmed aspic jelly. Pour the mixture into the prepared mould and leave it to set, serving it cold, with a little salad sprinkled with dressing heaped up in the centre.

Salmon Mayonnaise. Cold boiled salmon is needed to make a mayonnaise. Choose a middle cut of salmon, boil it according to the directions already given, and, when it is cold, take off the skin and cover the fish with thick mayonnaise sauce (see page 768).

Serve it garnished with thin, overlapping slices of cucumber. If the fish is not specially cooked for the purpose, but the remains of cold salmon are used instead they may be flaked, piled up high on a dish, garnished with green salad, and the sauce poured over them.

Salmon Mousse. To make this, take the skin and bone from $\frac{1}{2}$ lb. cold boiled salmon, pound it well in a mortar, and then add to it a small teaspoonful of hot and seasoned fish stock in which a little gelatine has been dissolved.

Rub the whole through a sieve, then whip it up with 1 gill thick and slightly salted cream. Turn the mixture into a prepared soufflé tin and place it in ice for a few hours before it is to be served. Chopped aspic makes a good garnish. See Fish: Lax, Maître d'Hôtel; Potted Fish.

SALMON TROUT. Salmon trout is a species of trout which migrate to the sea. In taste and colour their flesh differs but slightly from young salmon. Salmon trout can be cooked according to any of the recipes given for salmon and trout. See Trout.

SALOL. By the interaction of salicylic acid and phenol (carbolic acid), salol may be obtained. It is insoluble in water, and is usually prescribed in cachets or suspended in mucilage. The dose is 5 to 15 grains.

Externally, it is sometimes diluted with powdered chalk or talcum as an antiseptic dusting powder. Internally, its chief uses are as an intestinal disinfectant and in the treatment of rheumatic fever. In the intestine the drug is decomposed into carbolic acid and salicylic acid. A solution in alcohol, with the addition of aromatics, is used as a mouth wash.

SALPIGLOSSIS. Amongst half-hardy annuals salpiglossis is valuable for cut bloom under glass, and showy for beds and borders outside. Propagation is by seeds sown in a frame or greenhouse in spring. Care must be



Salpiglossis. Brilliantly coloured flowers of an annual plant much grown for indoor decoration

taken not to sow too thickly, and to give the seedlings plenty of ventilation, or they may damp off. After they have been hardened off the young plants may be safely planted out in June. Different varieties have such shades as blue and gold, golden yellow, gold-veined crimson, and purple. By sowing seeds under glass in September and growing the seedlings in slight warmth in ordinary potting compost a fine display in spring is assured.

SALSIFY: The Plant. An excellent root vegetable for winter use which is easily grown in well tilled friable soil, free from fresh



Salsify, which somewhat resembles a parsnip in appearance and an oyster in flavour

manure. From seeds sown out of doors in May, the rows should be 16 in. from each other and the seedlings thinned to 8 or 9 in. apart.

During summer the only attention needed is to hoe frequently between the rows. In autumn, when the tops have died down, the roots may be lifted and stored in soil at the foot of a wall or fence, or dug as required. If a few roots are left in the ground until spring, the fresh shoots, if cut when a few inches high, furnish what are known as charls.

How to Cook. Salsify has been popularly termed the oyster plant from its supposed resemblance to the oyster in flavour.

To prepare it as a vegetable, scrape the root gently, and lay it in cold water to which has been added a tablespoonful of

lemon juice. Put into a stewpan as much milk and water as will be required to cover the roots, add salt to it and let it boil up. Drain the salsify, cut each stick into pieces 3 or 4 in. long.

Plunge the pieces into the boiling milk or milk and water, add 1 oz. butter and a good squeeze of lemon juice, boil up and cook for from 30 to 40 min., or until the pieces are

tender. Dish the salsify and keep it hot, then strain the liquor and keep it for making a thick white sauce with which to cover the roots. Salsify may also be cooked according to any of the recipes given for celery. See Batter; Fritter; Sauce.

SALT: Household Uses. Salt is indispensable in cookery and as a preservative of meat and other vegetables. One of the simplest and most effective of cleansing agents, salt removes stains and grease.

There are several grades of salt, and it is customary to keep the finest for the table and a coarser sort for cooking and other purposes. The latter is generally the pure rock salt, while the refined white table variety frequently has ground rice or some other ingredient added to prevent it from caking. All salt should be kept in a dry place, as it is highly susceptible to atmospheric changes and quickly loses its savour if allowed to become damp. Salt easily corrodes the silver or other metal of which many salt-cellars are made, and for this reason these should be lined with glass, kept clean and frequently replenished.

For culinary purposes salt is used for seasoning all dishes and is added to the water in which vegetables are cooked. Fresh fish or meat not required for immediate consumption should be sprinkled with salt before being put away in the larder, and this precaution should never be omitted in hot weather, however secure the larder or meat safe may be against flies or bluebottles. In making ices the freezing mixture consists of ice well sprinkled with salt, which in dissolving keeps the temperature of the ice lower.

Salt is an excellent cleanser for dishes of all kinds, especially for enamelled ware and for removing stains, for cleaning baths, bamboo furniture, etc. Before blackleading a kitchen range any grease spots should be got rid of, and this can be done effectively by rubbing with salt. When sweeping a carpet salt may be sprinkled over it to clean it and bring up the colour.

Amongst other uses for salt, a handful thrown in front of the fire makes it burn clear and hot for toasting. About a teaspoonful dropped into the bowl of a paraffin lamp will cause it to give a better light.

In medicine chloride of sodium, which is common salt, has valuable therapeutic properties in the form of salt and brine baths. It is often employed as a gargle for the throat and is given as an emetic dissolved in hot water. See Emetic.

Garden Uses. There are various uses for salt in the garden: for instance, rock salt is an excellent stimulant for asparagus, beetroot, and other vegetables. This salt should be used at the rate of 7 lb. to the rod, but not more. Its value in this respect is due to the fact that it liberates the potash already in the soil, so making it feed the plants that need it.

Salt is also used for killing weeds; it is useful for clearing them from gravel walks, especially in cases where, as domestic animals are kept, poisons cannot safely be used. It should be applied generously in dry weather. See Weeds.

SALT BOX: How to Make. Owing to the corrosive effect of salt, the use of nails and metal fastenings is avoided as far as possible in making a salt box, which is usually of wood; because of the damp nature of the material the wood should be fairly thick and close grained. Beech is well suited for the work, but ash is often used, and American white-wood can be utilized. A convenient shape, illustrated in Fig. 1, measures 10½ in. by 7 in. at the base, 4½ in. in front, and 7 in. at the back up to the lid. The wood is ½ in. thick, the corners dovetailed.

Commence by planing up the front, A, to 4½ in. by ½ in., and cut to 10½ in. The sides, B,

are the same thickness, and 7 in. wide, with a length of $7\frac{1}{2}$ in. The back, C, is $10\frac{1}{2}$ in. by $9\frac{1}{2}$ in. by $\frac{1}{2}$ in. and the bottom, D, is $9\frac{1}{2}$ in. by 6 in. by $\frac{1}{2}$ in. The pieces are set out as in Figs. 2, 3, and 4. The dovetail pins are cut on the ends of the front piece, A, the distance between the shoulders being 9 in., and then placed on the sides in turn to mark out the exact shape of the sockets, as in Fig. 3.

The same is done with the back, C, as in Fig. 4 and then a $\frac{1}{2}$ in. wide and $\frac{1}{2}$ in. deep groove is ploughed $\frac{1}{2}$ in. up from the bottom edge of each piece to take the bottom piece, D. On the latter plane a rebate to correspond with the grooves, $\frac{1}{2}$ in. up the edge and $\frac{1}{2}$ in. deep, and complete the sides, B, by sawing off the front corner and planing smooth. Mark $1\frac{1}{2}$ in. down at the top of the back each side, saw off the waste, and plane down smooth, and then bore a $\frac{1}{2}$ in. hole 1 in. down in the centre. The parts are now ready to fit together, as in Fig. 5, and if the joints are true they can be glued up and left to dry.

In the meantime the lid is prepared, one piece being $11\frac{1}{2}$ in. by $6\frac{1}{2}$ in. by $\frac{1}{2}$ in., and the other $11\frac{1}{2}$ in. by 1 in. by $\frac{1}{2}$ in. The front edge of the large piece and both ends of both pieces should be rounded and finished smooth with glass paper. The glued box can now be trimmed at the ends and cleaned up with a sharp smoothing plane, the top edge of the front being planed to the slope of the sides, and the narrow portion of the lid sawed on from the back. Its lower edge must be planed down $\frac{1}{2}$ in., so that the sloping lid can be fitted. The top edge of the latter is now bevelled sufficiently to fit, and then attached with stout leather hinges, 2 in. long and $1\frac{1}{2}$ in. wide. A neater job is made by cutting recesses $1\frac{1}{2}$ in. from the ends to take the leather, which should be secured with $\frac{1}{2}$ in. round-head screws.

The outside of the box should be sized and varnished, the inside is left plain, so that it can be washed out when necessary. On account of the action of salt on metal it is not advisable to use plain butt joints or to nail or screw the box together. The work can be

simplified by screwing on a plain base, which can be fitted on the outside and screwed from the bottom or fitted between the sides.

SALT CELLAR. In England the first salt cellar was a large bowl placed in the centre of the table. This was succeeded by a covered vessel known as the standing, or steeple salts, which was a fashionable piece in the 16th and 17th centuries and was made of silver, rock crystal, and other valuable materials, some being, in addition, ornamented with gold or precious stones. Examples are highly prized.

The modern salt cellar, which is a smaller vessel, came into vogue about 1700, and has been made in a great variety of styles. Round, oval, and octagonal examples exist both in silver and in Sheffield plate. Some stand on four feet and others on three, while some are without feet. Others have a square base. The claw and ball, the lion's paw and the stepped cone are among the types of feet found.

Decoration takes the form of embossing, piercing and chasing. Some have beaded and others gadroon edges. Designs such as those illustrated are much copied for modern silver salt cellars; others are made of glass, china, pottery and electro-plate. These metal containers should have glass linings, otherwise the salt is liable to corrode the silver or plate. Usually made in pairs or sets of four, salt cellars should match in style the pepper and mustard pots in use on the table. With most salt cellars a small spoon is provided. See Silver, Table Laying.

SALTING: OF Food. By adopting this method of preservation many foods are kept in good condition which otherwise would rapidly decay. Also many articles of diet which do not last for a season can be preserved and become valuable adjuncts to dishes or may form dishes in themselves and help to vary the menu.

To salt food, the dry salt may be rubbed over the surface, or it may be made into liquid brine with water. Salt pork is treated with brine, also beef and occasionally mutton. The brine often has an admixture of saltpetre, sugar and spices.

When meat is plainly salted all kernels should be removed. The meat must be rubbed all over in every part, and any hollows left by skewers or kernels being cut out should be filled up with salt. A round of beef weighing 20 lb. will take $1\frac{1}{2}$ lb. salt. Meat should be salted as soon as possible after being killed if the weather is warm, but if the atmosphere is chilly or frosty it should be kept for a few days, and if the frost is in it, it must be thawed before being salted. In very cold weather the chill must be taken off the salt before it is used. To make the meat red, a little saltpetre should first be rubbed over it.

To salt fish, clean and wash it, then dry it thoroughly and cut it open down the back. Wipe it with a clean cloth, score it, and place

a layer of salt on it each side. Keep the salt on it three days, then hang it up to dry or smoke it. Sometimes the spine bone is removed from the fish before salting.

Some varieties of green vegetables may be salted and will keep all the winter. The best

vegetables to treat in this fashion are French beans or scarlet runners. The beans must be cut on a dry morning, wiped, and laid in earthenware jars in layers with a good sprinkling of salt between each layer. Let salt cover the top of them. Secure them from the air and keep in a cool, dry cellar. See Beef, Pickle, Pork.

SALTPETRE. Commonly known as nitre or potassium nitrate, saltpetre is a natural product obtained by the lixiviation of earth, where the occurrence is in the form of an efflorescence. purification is effected by crystallization. It is used medicinally for the treatment of asthma and colds; it is a constituent of some explosives and fireworks, and of some chemical fertilizers. Wall or blue saltpetre, made by fixation of nitrogen from the air, is used as a manure. As a brine, saltpetre is used in the salting of meat.

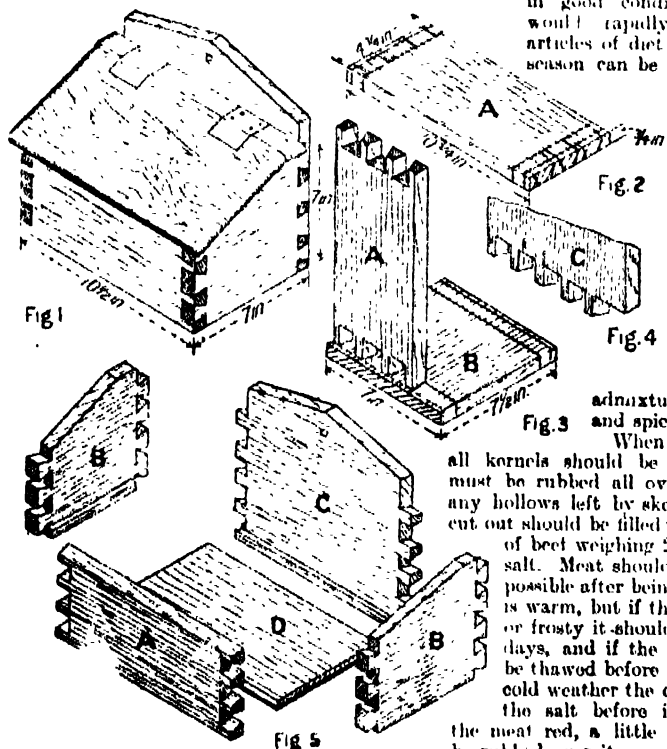
Salts. See Epsom Salts; Saline.

SALTS OF LEMON. This preparation, which is known also as oxalic acid, consists of equal parts of cream of tartar and potassium oxalate. It is used for cleaning white straw hats, removing non stains from linen, and from stains and other marks from woollen and silk materials. It is exceedingly poisonous and corrosive, and should therefore be kept well out of the reach of children. Directions for treatment in cases of poisoning are given under the heading of oxalic acid (q.v.).

SALUKI. Of this dog there are two varieties, the rough and the smooth, the former being the more popular. The rough coated have feathers on the ears, on the hubs and on the tail, but the smooth dogs are free from this. In height the saluki varies from 24 in. to 28 in. according to the locality of its origin. The females are smaller than the males. In general conformation the breed resembles the greyhound. In colour the saluki is either fawn, cream, white, red, grizzle, black and tan or tri-colour. As a breed they



Saluki. Specimen of this breed of dog which somewhat resembles the greyhound.



Salt Box. Fig. 1. Salt box made from close-grained wood. Figs. 2-4. Showing how front, back, and sides are dovetailed into each other to avoid use of nails. Fig. 5. The parts ready for gluing together.

are very nice dogs, usually sweet tempered, obedient and intelligent.

The head should be long and narrow, the eyes dark or hazel, ears well feathered and also the limbs, whilst the tail should have a superabundance of feather on it and be carried in the so-called ring-tail fashion.

SALVER. There is no hard or fast rule as to the distinction between a salver and a tray, but in general a salver is regarded as a smaller edition of the tray proper. It is used for carrying a single cup of tea or other drink, and also by a servant for presenting a letter or card. A small salver is generally kept for this purpose on the hall table. A larger salver makes a charming addition to the breakfast table when used as a stand for the coffee-pot and hot milk jug.

Salvers are made of silver and Sheffield plate, as well as of electro-plate. In England the earliest known specimens date from the 17th century, but those most in demand by collectors are square ones made in the 18th, and having ball and claw feet. A great variety of decoration was used thereon by the 18th century silversmiths and their successors, these including the gadroon and ornament in the shape of dolphins, masks, shells, scrolls, vine leaves, etc. Old salvers of Sheffield plate are usually tinned on the underside. See Silver: Tray.

SALVIA. The botanical name of sage, of which there are some splendid ornamental kinds suitable for the greenhouse and for planting out of doors. The purple sage (*Salvia virgata nemorosa*) is the best of the hardy kinds; it is a showy herbaceous perennial, 2-3 ft. high with violet-purple flowers in July-August. Propagation is by cuttings in a frame in spring. *Salvia azurea* Pitcher, 4 ft. high, is a lovely blue-flowered plant for a warm sheltered border, at its best in late summer.

The scarlet sage (*Salvia splendens*) is one of the most brilliant of summer bedding flowers, and is invaluable for the greenhouse also. Seedlings raised in a heated greenhouse in January-February will provide plants for putting out of doors early in June, or cuttings can be taken from the old plants in August and kept safe from frost in winter. Exceptionally fine varieties are *Pride of Zurich*, *Fireball* and *Harbinger*, which should be chosen in preference to the type.

The blue sage (*Salvia patens*) is a half-hardy tuberous rooted perennial easily raised from seeds sown in warmth under glass in February; the seedlings may be planted out of doors early in June, or grown in pots for greenhouse decoration. In autumn the tubers should be lifted, stored in sand for the winter and started into growth again under glass in spring.

The hardy annual sage called the Clary (*Salvia hornum*) is raised from seeds sown out of doors in September or in April; its beauty lies in the coloured bracts which surround the small flowers. The purple-blue variety named *Blue Beard* is the best.

SAL VOLATILE. Aromatic spirit of ammonia, commonly called sal volatile, is a reliable heart stimulant in fainting, shock, etc. It is also sometimes prescribed before meals as a gastric stimulant in chronic indigestion.

SAMIAN WARE. Modern reproductions of the lustrous red terra-cotta fabrics which go by the name of Samian ware are attractive in form, suggesting a classical atmosphere,

which is emphasized by the moulded designs and scenic reliefs pressed upon them. This ware was supposed to originate in Samos.

During the Greco-Roman period the manufacture was taken up by a number of provincial potteries, especially in Gaul and the Rhineland. Almost all the so-called Samian ware found in conjunction with Romano-British remains was imported from these centres and its production did not survive that period.

This earthenware, which is more precisely called *terra sigillata*, is distinguished by its close-grained body, sometimes showing traces of having been turned in the lathe, and displaying, when broken, a light-red fracture all through. It is coated uniformly with a thin, transparent sealing wax glaze, which was produced by means of a solution of green vitriol. It is usually

ornamented in relief. The vases, bowls, cups and dishes are generally small, and are seldom found unbroken. See Pottery.

SAMOYEDE. The Samoyede dog belongs to the Arctic breeds, sharing in common with the others a foxy head, small, erect ears, a tail



Samoyede. Breed of white Arctic dog which has become popular in Great Britain.

curled over the back, and a close, soft undercoat, through which long harsh hair grows, forming the outer coat. This is usually of a very brilliant white, and is of a texture that does not soil readily. They are smaller than one would expect in dogs that are capable of drawing heavy weights, the males weighing about 50 lb., and bitches about 10 lb. less. Those who own them find that they are very sociable and well-mannered. See Dog; Kennel.

SAMPLER. In its earliest form a sampler was a piece of work that exhibits in a small space all the stitches and processes of the work which it represents. Calico samplers were provided for the young in early Victorian days in order that plain stitchery should be practised.

A sampler of that kind would exhibit plain hemming, hem-stitching, back-stitching, gathering and setting into a band, pleating, tuck-running, running and felling, buttonholes and sewing on buttons, whipping and setting on a frill, the insertion of a gusset, piping, how to put on a crossway false hem, an ordinary calico patch, how to sew on a tape, how to make a loop and eyelet hole. Featherstitch and French knots as simple forms of decoration would also be shown.

Decorative samplers, such as the one illustrated, were worked by old and young from Elizabethan times down to about 1840, after which they went out of fashion. Now that such great store is set on period needlework again, old samplers are being copied and originals are sought in antique shops. Samplers can be turned to charming account by being mounted on pole



Sampler dating from 1800, with small figures, birds and trees, embroidered in coloured silks upon fine canvas. In the centre is the following moral verse: "Virtue the chiefest beauty of the mind, the noblest ornament of human kind. Virtue our safeguard and our guiding star, that stars up reason when our senses err."

fire screens, blotters, work bags, etc. On page 177 an excellent idea for a calendar, utilizing a modern sampler in cross-stitch, is illustrated and described. Designs can be obtained in good needlework departments, and those interested in the subject will do well if able to study the examples in the Textiles Department at South Kensington.

Although modern samplers are often worked quickly in cross-stitch, this does not do justice to the beauty possible in these pieces. In a sampler such as the one illustrated a great number of stitches are employed. The proper stitch should be used to form particular objects. Satin-stitch and stem-stitch are used for animals and figures, petit point fills in vases and cross-stitch is reserved for trees and the dark portions of the border. All objects illustrated on a sampler are much conventionalized. Some interesting modern samplers have central motifs of motor cars, speedboats, airships and borders introducing modern musical instruments. In one case these subjects were copied from magazine advertisements on to fine canvas and conventionalized in the stitchery. If preserved, such samplers will have a historic interest in years to come, and to day make amusing needlework pictures when glazed and mounted in narrow black frames.

SANATORIUM. An establishment for the treatment of the sick may be called a sanatorium, though the use is more especially used for places where convalescents or tuberculous patients are treated. Sanatorium treatment of tuberculous is valuable, not only because patients are under direct supervision in conditions as favourable as possible, but because they receive training in looking after themselves. See Tuberculosis.

SAND: In Gardening. Sand is an important ingredient of garden soil. Clay land is greatly improved by an occasional application of sharp clean sand. Silver sand is used in the preparation of potting composts; plant cuttings often form roots more readily in sand than in soil.

SAND: In Building. The three main sources from which sand is obtained for building purposes are pit, river, and sea-shore. The fine sand is used for plasterer's mortar, the more coarse varieties for ordinary mortar. Its function when mixed with mortar is to produce regular shrinkage of the materials, and also channels for crystallization in setting.

Pit sand is the first in quality, and has sharp angular grains. It may contain impurities such as clay, earth, or organic matter. River sand is practically free of impurities, but owing to the action of the water its grains are not sharp and angular. Sea sand is not to be recommended for building work, especially plastering, because the saline matter it holds attracts any moisture that is in the air. This will result in damp walls, and prove injurious to decorating on them. Sea sand is, however, used for bricklayer's mortar, and is very useful in constructing playing pits for the children. See Brick; Cement; Mortar.

SANDALWOOD. This is a hard, close-grained, yellowish-brown wood. It has a fragrant smell, which increases with age, and when it is burning there is an aromatic odour. Ground into powder, it is used in cosmetics, and an aromatic oil is distilled from it, and used in medicine as an internal disinfectant. As a wood it is used chiefly for small fancy ware, carved articles, finger plates for doors, etc. See Wood.

SANDARAC. Among resins of the lac kind, sandarac is an important substance. It is a hard resin of yellowish tinge which melts at a heat of 300° F. and breaks with a lustrous fracture, exuding from pine trees in North Africa. It is known variously as pine

gum, white pine resin, and gum juniper. It is completely soluble in spirits of wine, and practically in petrol and turps. It makes good photographic negative varnish, and is also used by bookbinders and for school blackboards. Being hard, it requires making more elastic by mixing with a West Indian resin known as elemi. This material is much used to soften or toughen varnishes. See Resin; Shellac.

SANDBAG. Used in repoussé and art metal work, the sandbag is a leather or linen receptacle filled with well-washed silver sand. The linen or canvas covered bag is useful for supporting the pitch block and deadening the noise made by the hammering. The leather bag of 3 in. to 9 in. diameter is made in two shapes, one with a hollow centre, known as a ring, to hold the pitch or cement bowl used in repoussé work and metal chasing. The other, in the form of a round pad, is used for beating out metal to a hollow form. To preserve leather sandbags, the cover should be wiped over with an oily rag. See Repoussé.

Sand Box. See Pounce Pot.

SAND CAKE. A variety of cornflour cake, this is made by sieving $\frac{1}{2}$ lb. cornflour, then measuring out 1 oz. of it and mixing it with $1\frac{1}{2}$ teaspoonfuls baking-powder. Separate the yolks from the whites of 3 eggs, beat up the yolks, and stir half of them into $\frac{1}{2}$ lb. castor sugar, previously creamed with 7 oz. margarine. Beat the mixture for 5 min. before adding the remainder of the yolks, continue beating for a few minutes, and then fold in the larger portion of the cornflour.

Add the whites of egg, whisked to a stiff froth, and also a little lemon or vanilla flavouring; mix the whole thoroughly, and lastly stir in the baking-powder and the remainder of the cornflour. A little milk may be used if necessary. Turn the mixture into a greased cake-tin, lined with greased paper that reaches just above the top of the tin, and bake it in a moderately hot oven for about $\frac{1}{2}$ hour. Then take it from the tin, carefully remove the paper from round it, and let the cake cool on a sieve.

SAND GLASS. Sand glass, which are also known as hour glasses, are used to measure time; for instance, the time needed to boil an egg. See Egg Boiler; Hour Glass.

SAND MYRTLE. This dwarf evergreen flowering shrub belongs to the family of heaths, and botanically is known as *Ledum*. The chief kind is *buxifolium*, about 6 in. high, with small, glossy leaves and white flowers, being particularly suitable for the rock garden.

Sand myrtle thrives in equal parts of leaf-mould, peat, and sand, with plenty of moisture at all times. It is planted in spring or autumn, and propagated by layering of shoots in October.

Sandpaper. See Glass Paper.

SANDSTONE. Consisting of a compacted mass of sand bound together by lime carbonate, iron oxide and silicas, sandstone as a building material is comparatively soft, lending itself easily to delicate architectural decoration. For this reason it is often carved and embellished, frequently in a very elaborate manner.

SANDWICH. It is always advisable at a picnic, bridge, or informal evening party to have some less well-known but really good sandwiches to introduce to the guests. When estimating quantities it is well to allow two sandwiches per head (where other refreshments are also provided). Three quarter sandwich loaves to 3 lb. butter, or butter and margarine mixed, or margarine, will make sandwiches for 100 people if the bread is properly cut.

Almost any kind of cold meat or fish can be used for sandwiches, while other savoury fillings include cheese, sliced hard-boiled eggs, potted meats, olives and cream cheese, nuts

and salad vegetables. Sweet sandwiches may be filled with jam, honey and banana, lemon-curd, walnuts and stoned raisins, grated chocolate, or honey mixed with chopped nuts.

The bread should be thinly cut and fresh, though not too new, or it will break in the making. A very sharp, long-bladed knife should be used. The filling should be laid on one slice, seasoning added if required, the remaining piece of bread pressed firmly on the top and the edges trimmed. For picnic purposes the crust is often allowed to remain as the sandwiches keep a better shape. For afternoon tea or buffet service the crumb only is left and is cut into square, diamond, or triangular shapes. For bridge parties it is sometimes stamped out with cutters into spade heart diamond and club shapes. Plain biscuits, rye biscuits, toast, bridge rolls and brochies are all used for making sandwiches in place of ordinary bread. The first two are good for savoury pastes and cream cheese fillings; thin, hot, toasted brown or white bread is liked for Canadian loaf cheese and for hot bacon sandwiches, while small finger rolls are suitable for any kinds of fillings and brochies for sweet sandwiches. Potted meat or fish paste sandwiches are dainty for tea when the bread used is sufficiently thin and fresh to be rolled.

The bread, biscuit, toast, or roll should be buttered. Butter adds to the food value, and prevents juices from the fillings soaking through the sandwich. The butter (or substitute) should be creamed with a wooden spoon before spreading on the next loaf. Fillings must not be scanty or the sandwich will be dry and tasteless, but they must not be so lavish that they ooze out. Pack sandwiches for a picnic in waxed paper, and wrap wet butter muslin, or a napkin wrung out in cold water, round the whole until required.

Meat Fillings. Meat used for sandwich making should be free from gristle and cut into very thin slices or pieces of convenient size. Ham often improves beef, chicken and tongue. If savoury sandwiches are wanted, either tomato sauce, finely chopped pickle or chutney may be spread over the layers of meat. Seasoning must not be forgotten. All kind of sausages, cut into thin slices and the skins removed, make good fillings. Pâté de foie gras is a favourite filling. Double-decker sandwiches are liked with a layer of chicken and another of finely-chopped salad moistened slightly with mayonnaise and separated by an extra piece of buttered bread. Grated ham may be used with or instead of the chicken, and both will make an excellent filling for a hot, toasted sandwich. The meat is first warmed in a saucepan with a little butter and chopped parsley and then spread on a piece of buttered toast and covered with another piece.

Fish Sandwiches. Cold fish should be flaked and freed from bones. It requires sauce, or cucumber, tomato or lettuce salad to make it tasty. Bloaters, smoked haddocks and kippers make excellent fillings for brown bread sandwiches. Remove the skin and bones and mix with a little anchovy sauce and cayenne. Lobster or crab is good when pounded and mixed with a little thick mayonnaise sauce. Cod's roe with cream and seasoning makes popular sandwiches. Break up 3 tablespoonfuls cooked roe, season it with anchovy essence, pepper and a squeeze of lemon-juice and moisten the whole with a tablespoonful of cream. Spread the mixture on thin brown bread-and-butter and form into sandwiches.

Sardine sandwiches can be made in several ways. The fish should be drained from the oil, skin and bone removed and pounded, adding seasoning and a squeeze of lemon-juice. An excellent filling is made by adding the yolk

of a hard-boiled egg, 1 teaspoonful anchovy essence, 1 dessert-spoonful anchovy paste and 1 oz. butter to the sardines, pounding them to a smooth mixture and spreading on brown or white bread-and-butter.

Egg Sandwiches. The yolks of two hard-boiled eggs make a good filling when mixed with anchovy essence, chopped olives, and sufficient cream or creamed butter to bind the ingredients. Another egg sandwich is made of slices of hard-boiled eggs and tomatoes, or the slices of hard-boiled egg may be moistened with salad cream and placed between two layers of finely chopped salad.

Cheese Sandwiches. Cheese may be grated, mixed with butter and seasoning and spread on a layer of chopped watercress between thin bread-and-butter. Alternatively it may be cut into thin slices, spread with mustard, sprinkled with seasoning and made into sandwiches, with rye crisp bread well buttered and flavoured with chopped gherkin.

Cream cheese is good mixed with walnuts or other nuts, or with chopped olives. Chopped lettuce or watercress, or finely diced apple and celery with cream cheese, may also be used as a filling for thin brown bread-and-butter.

Sweet Sandwiches. Mixed nuts and sweetened whipped cream make a good filling spread over a thin layer of apricot jam on split, sweetened brioche, white or brown buttered finger rolls, or slices of plain cake. Chopped and stoned dates with pounded almonds and lemon-curd make an unusual sandwich with buttered crustal bread. Honey may be substituted for the curd if a sweeter mixture is liked. French plums are excellent with walnuts and cream. Chocolate grated and mixed with whipped cream flavoured with a few drops of vanilla essence may be used between thinly sliced bananas and bread-and-butter, or the grated chocolate with pounded almonds and enough sweetened cream to form the mixture into a paste makes an excellent filling for a sandwich of wafer biscuits. Sponge fingers are equally good when put together in pairs with whipped cream and strawberry or apricot jam between.

Sandwich Sets. Practical and decorative sets for sandwich service are obtainable in china, pottery, glass and in a variety of shapes and sizes. The dish for the sandwiches is usually oblong, and plates to match are often square in shape. Small tiered and plated stands to hold several plates of sandwiches are useful for tea and bridge parties, as they take up less space on the table.

SANDWICH CAKE. The phrase sandwich cake is usually applied to a light, spongy cake baked in two shallow tins or cut into two after baking, and then spread with jam. Directions for making such a cake will be found under the heading jam sandwich. Cream, chocolate icing and other mixtures are sometimes used as a filling instead of jam, the cake being then named accordingly. See Jam Sandwich.

SANDWORT. The popular name of a group of beautiful low-growing rock garden plants (*Arenaria*) which bloom in spring and early summer. The finest of all are montana and grandiflora, which soon spread if planted in gritty soil in a sunny place and bear a profusion of white flowers.

The Balearic sandwort (*Arenaria balearica*) should be planted in light soil at the foot of a shady rock, which it will cover with a veil of delicate leaves and tiny white flowers. Propagation is by seeds sown in spring in a frame.

SANITATION: Of the House. The important points about any system of sanitation are to see that the refuse of whatever kind is removed completely, rapidly, and continuously, and that it is protected as much as

possible from the outside air. Methods used in the country where sewers do not exist are called conservancy methods, and in towns where sewers and a plentiful water-supply exist, the water carriage system is used. In both of these systems waste waters and excremental refuse have to be removed.

Conservancy Methods. Dealing first with conservancy methods, the old types known as privy middens and privies are thoroughly unsanitary and should be abolished as the material is never completely or rapidly removed, and is not protected from flies, etc. Earth closets and pail closets are less objectionable and can be made reasonably sanitary if emptied frequently, at least twice a week, and kept scrupulously clean. The material should be dug into trenches well away from the house or any source of water supply, and should be covered with at least four inches of earth.

Bath and washing water should not be allowed to run into the nearest ditch where it may give rise to a nuisance, but should be run through a series of porous drains at a depth of about 6 in. below the ground. This is better than running it on the surface of the soil. At the house end of the pipes a grid should be fixed to strain off large particles, which might clog the pipes if left undisturbed.

Cesspools should be connected with the house in the same way as a sewer. They should be placed at a safe distance from the house or water supply, and must be ventilated, and constructed so as to be watertight. Periodic removal of the contents of the cesspool is necessary if the water supply of the house is small. If taking the waste water of the house also, the overflow pipe may lead the sewage either under specially prepared land or on to a proper filter-bed, but care must always be taken that the water supply is safeguarded.

Water Carriage System. Coming next to the water carriage system, this is the ideal method, as refuse is carried away completely, and rapidly by a flow of water. The main drain is partly below and partly above ground. The latter part is called the soil-pipe and is carried well above the roof of the house and covered by a wire cage to prevent birds from building nests and blocking it; the open top allows air to circulate through the drainage system. Into the soil pipe open the discharge pipes for water closets, slop sinks and urinals, all of which have a proper trap, with an adequate seal of water to prevent drain gases getting back into the house.

Baths, washing and kitchen sinks must also have a trap, but they discharge into a pipe on the side of the house, distinct from the soil pipe, and then into a gully. This gully is again trapped before discharging into the main drain. Rain water sometimes has a pipe to its own discharging into a gully. The difference discharges finally reach the drain and then pass through a final trap before entering the sewer, so preventing sewer-gas from entering the house drain.

The householder can always obtain the help of a sanitary inspector from the health office of the local authority, and would be well advised always to have a thorough inspection undertaken before entering a house. In particular it is necessary to have the drains tested by a competent inspector.

The matters that the householder himself can decide are to see that all sanitary appliances are made of smooth, impermeable material, that the water closet is of good type, that the flush is adequate; that the traps are sound, actually contain water and are not blocked; that outside and inside pipes and taps do not leak and are of sound material, and that lavatories are well-ventilated and in the right position. The sanitation of a house requires considerable supervision. All appliances, and water-closets in particular, must be

kept clean. The pan of the latter can be cleaned at intervals with a rag moistened with spirits of salt, or by using one of the powder preparations advertised. If an accessible trap gets blocked it may be cleared by unscrewing the stopper which is at the bottom of the trap, but this is only possible with the traps of sinks, basins, and baths.

The kitchen sink and its trap can usually be kept clean by pouring down it every week a pailful of boiling water containing $\frac{1}{4}$ lb. of soda. A smell in a sink can be removed by pouring in a pailful of hot water containing a tablespoonful of permanganate of potash and allowing it to stand for a couple of hours. Grids over gullies and pipe heads must be kept clear of leaves and debris. Gullies in the open must be cleansed regularly, and in summer when the water in the seal may evaporate, they should be flushed with water.

The Chemical Closet. This closet uses exactly the opposite principle to the dry earth closet, reliance is placed upon liquid chemicals for the immediate sterilization and the disintegration of sewage and paper, so as to produce an inoffensive liquid.

There are two kinds generally in use, the portable and the permanent. The former consists of a ventilation chamber through which an air draught carries any chemical fumes to the outlet pipe at the back of the seat. The inner container is provided for the reception of urine and excreta. For operation in this case, a charge of 1 pint of chemical is added to 1 gallon of water and placed in the container. The matter entering the container becomes deodorized and sterilized. When full the contents may be disposed of in a similar way to that employed in the earth closet. The sewage may, however, be used as a manure after it has been mixed with slacked lime, decayed vegetation, and earth. This type of chemical closet is largely used in motor coaches, aeroplanes, small cottages, etc.

The second type is for buildings of a more permanent character where no sewers exist. An underground tank is provided into which the closets empty direct. When the tank is full, the contents are disposed of by opening an outlet valve which lets the contents discharge into a soakaway, where it percolates into the earth. Should the soil not be suitable (e.g. clay), then an ordinary cesspool is used from which the contents are discharged over the earth, or it may be carried away to any convenient place for disposal. See Cesspool; Drains; Earth Closet; Pipe; Septic Tank; Water Closet, etc.

SANTOLINA. The botanical name of a group of hardy shrubs with fragrant leaves and daisy-like flowers in summer, they grow 18-24 in. high, thrive in ordinary well-drained soil, and make attractive low hedges, or may



109. Soft downy foliage of the *Santolina chamaecyparissus*, attractive in the rock garden

be planted in the rock garden. The chief kinds are the grey-leaved yellow-flowered *Santolina chamaecyparissus* and the green-leaved, white-flowered *viridis*. Propagation is by cuttings in a frame in late summer.

Saponaria. See Soapwort.

SAPPHIRE. Sapphires are found in almost every shade of blue. In some specimens a blue-violet tint is seen, in others cornflower blue. The last named are the most highly prized. Large sapphires are generally cheaper than rubies of the same size, but a flawless sapphire of a deep shade always commands a high price. The value of the gem is best judged at night, because the cheaper stones lose their blueness and some of them appear almost black in artificial light, but good stones retain their colour.

Rings, brooches, pendants, and bracelets are all set with sapphires. Diamonds are almost invariably used with them, for the intense blueness of the sapphire accentuates the whiteness of diamonds by contrast.

Stones that are sometimes confused with sapphires include the blue tourmaline and the blue topaz. These, of course, are inferior gems, and usually may be detected by their lightness. They are also softer than the genuine stone, and are therefore more easily scratched. See Diamonds & Jewelry.

SAPWOOD. The wood of very young trees, known as sapwood, is generally light in colour and porous. In some trees the colour changes very little indeed as the tree grows older, and such are called sapwood trees. They are found in Great Britain among the sycamores, beeches, and hollies.

Although sapwood may be regarded as imperfect timber, there are one or two cases in which its value is considerable, exceeding that of heartwood or wood that is completely mature. For instance, the sapwood of the hickory has a greater value for handles and the like than the heartwood. Many of the American woods are noted for their abundant sapwood, notably the satin walnut, the loblolly pine and the basswood. See Wood.

SARDINE. Among the cheap varieties of the so-called preserved sardines, sprats, very small herrings, brisling or pilchards are substituted for the real fish. None of these, however, possesses the delicate flavour of the true sardine, which is caught off the coasts of Brittany and Sardinia from June to the middle of October, and is, as a general rule, preserved in oil or tomato sauce and exported.

Sardines are useful as a savoury, also for serving as hors d'oeuvres and in salads. Sardine mustard, which is employed to give a zest to fish dishes and also for spreading on savoury biscuits, is made by pounding the sardines and mixing with hard-boiled eggs, chopped shallot, dry-mustard, oil and seasoning.

A good way of preparing sardines consists in cutting the tails from a small tinful of these fish, removing the bones, and then flaking the flesh into small pieces. Melt 3 oz. margarine in a saucepan, add 1½ oz. flour, mixing it well in, and then pour in gradually 1½ pints white stock, stirring all the time until the mixture boils.

Then cook it slowly for a few minutes, add to it the flaked fish, a teaspoonful of breadcrumbs, a little of the oil from the tin, 3 teasp. tomato sauce, a squeeze of lemon juice, and salt and cayenne to taste. Mix all these ingredients together, then turn them into a small pie-dish, sprinkle the top with browned crumbs, and reheat in the oven.

Fried and devilled sardines make another good dish. The fish should be split open, boned, and folded together again, then sprinkled with dry mustard, cayenne, salt, and lemon juice, and allowed to stand for about 15 minutes. They should then be fried in a pan in their own oil, and served on croissants of fried bread. Another method of frying sardines

is to skin them, dip them in batter, and then cook them in a pan of smoking hot fat. Serve garnished with parsley.

To grill sardines, drain them from their oil, coat them with sieved flour, and then cook them before a clear fire or beneath a gas grill for 4 or 5 min. Serve them immediately with a plate of brown bread and butter, garnishing them with lemon. Sardine eggs can be made in the same way as anchovy eggs, substituting sardines for anchovies.

To make a sardine omelette add 3 or 4 chopped sardines and a teaspoonful anchovy essence to a plain omelette mixture and cook as described under omelette.

Another savoury can be made by removing the bones and skins from eight sardines. Then take some thin slices of brown bread, butter them, and cut them into fingers, each rather larger than a sardine. Place each sardine between two of these fingers, press them together, and fry a golden brown in hot fat.

To prepare sardine toast, remove the heads and tails from 4 sardines, split the fish open, and take out the backbone. Then lay the halves together again, heat them in the oven, and place on finger-shaped pieces of hot buttered toast.

Keep them hot, and in the meantime melt 4 oz. margarine in a small saucepan, add to it 3 yolks and 1 white of egg whisked together, 3 teaspoonfuls vinegar, and a little salt and cayenne. Whisk this mixture over gentle heat until it becomes thick and creamy; take care that it does not boil, or the eggs will curdle.

SASH WINDOWS: RENEWING THE CORDS

Practical Instructions for Carrying out Repairs

With the aid of the illustrations and directions here given, the amateur mechanic will be able to keep his sashes and cords in order. See also Burglary; Casement; Glass; Window

A sash window is a type of opening and closing window in which the upper and lower windows are weighted to facilitate their movement in an upward or downward direction. The window is balanced by means of heavy iron or lead weights, arranged to move up or down in a well in the framework. Two such weights are used to each moving window, being arranged one on either side of it. The weights are connected to the window with sash cords, which pass over grooved pulleys sunk flush with the framework. The pulleys are placed at the extreme top of the framework.

In modern work both upper and lower sashes are movable, but in some of the old designs only the bottom sash is arranged to move, consequently the ventilation of the room suffers.

The sashes are arranged in the frame so that they pass each other as they are raised or lowered. They slide in grooves formed by the casings of the frame, and are suspended on sash cord. Although between the sashes there is a parting slip, the centre rails of the sashes are arranged so that they meet, and they are played so as to form a good fit in order to prevent them rattling, and to make them wind and water tight. It is on the centre rail that the fastening is fixed in order to keep the window closed.

The sash cord is attached to the window by means of 1 in. wire nails hammered through the cord. An alternative method to this employs a screw and washer which is turned home at the end of the cord. A circular recess is usually made in the side of the window in which this screw is placed. Two common methods are used for the attachment of the cord to the weight. One has a loop threaded through an eye in the top of the weight, the free end of which is bound to the length of the cord with fine string. The other method simply has a knot tied at the end of the cord after it has been passed through the eye in the weight.

Pour it over the sardines, sprinkle with chopped parsley and red pepper and serve.

Sardines and tomatoes on toast may be prepared in the same way, except that a little mashed tomato is spread over the toast before the sardine and the egg mixture are added. See Hors d'Oeuvres; Omelette; Sandwich.

SARDONYX. This is a particularly beautiful variety of onyx, composed of alternate layers of white or light-coloured chalcedony and rich, orange-brown cornelian. See Onyx.

SARSAPARILLA. The dried root of a tree imported from Central America, and known as Jamaica sarsaparilla, has been used medicinally, but it is not now included as a remedy in the British Pharmacopoeia. In the dried form it would appear to have no medicinal properties.

Sarsaparilla is a common ingredient of many tonics and blood purifying mixtures, in which other drugs are included. Common preparations are: The liquid extract of sarsaparilla, dose, 2 to 4 fluid drams; the concentrated compound solution of sarsaparilla, dose, 2 to 3 fluid drams. The drug is in no circumstances prescribed by itself. Pron. Sär'sa-pa-rilla.

SARSENET. The name has to a large extent dropped out of use, because old-fashioned sarsenet has been superseded by Jap silk, white, black, or coloured. The material is a plain, thin, and rather shiny silk. Sarsenet ribbon is suitable for making soft binding for the edges of dress seams, pambulator rugs, cot blankets, and so on.

Where this second method of construction is employed care must be taken to prevent any free end of cord from fouling the movement of the weight. The weights used for window sashes are extremely long and thin, in order that they may slide in the small space in the frame allotted to them.

Repairing the Sash Cord. It sometimes happens that a sash cord breaks after the windows have been in use for some time, consequently the balance weight will fall, and the sashes will be hard to move. It is not a difficult matter, however, to replace a broken sash cord, and the process is clearly shown in the photographs on the next page.

Figs. 2 to 10 illustrate the renewal of the cords in top and bottom sashes of the double window frame, shown at Fig. 1. Proceeding with the lower window first, it should be raised some distance, and if it shows any tendency to drop down, it should be kept up with a stick of wood. In the majority of cases this precaution is not necessary, as the defective sash usually jams readily.

The bead at the bottom of the window frame is removed with a chisel. The tool should be placed as nearly as possible under the nails holding the bead down. To prevent damage to the paintwork the point of a knife should be used to break the joint between bead and sash before prizing up the bead.

One of the side beads is next removed, when the lower sash may be swung clear, and the broken cord removed from the frame. The fitting of the new sash cord is carried out as detailed below for the top sash.

In cases where it is only necessary to repair the top sash, the bottom sash must also be removed, this being done first (Fig. 2). When detaching the cord, take care that it does not come away suddenly, as if that should happen the weight would drop, pull the cord right through the pulley, and be lost inside. When



or a "mouse" is used with a length of string to one end of which the cord is attached. The mouse is a long, thin leaden weight, small enough to pass over the groove in the pulley, and having a loop at one end for the attachment of the string. The other end of the string is securely fastened to the new cord. The mouse is pushed over the pulley and drops down into the weight box, carrying with it the string. Fig. 7 illustrates the use of a piece of chain for the purpose.

Having pulled the cord through to the hole from which the weight was withdrawn, this end of the cord is joined to the weight. In Fig. 8 the method adopted is to bind over the free end of the cord with strong string. The free end of the new cord is left hanging while the old cord is removed from the sash. This latter operation is performed with a small cold chisel and a hammer, as shown in Fig. 9 below.

The exact length to cut the new cord requires careful consideration. If it is not long enough, the weight will be drawn to the top before the window is closed, in the case of the bottom sash. If the cord is too long a top sash will not close, owing to the weight having already reached the bottom. The best plan is to make a rough measurement of the length of the cord tacked to the sash, and to mark this length downward from the top of the pulley. The new cord is now pulled up until the weight swings clear. The cord is placed against the mark and is cut about 3 in. above the mark.

The method of securing the cord to the sash is shown in Fig. 10. It is placed in the groove in the sash designed to take it and then tacked on with 1 in. wire nails. During this operation it is important to see that the end of the cord is carefully tucked out of the way, as it may subsequently cause trouble by jamming if left loose. A nail or two at the very end of the cord will obviate any possibility of trouble in this direction. Where new sash cords are fitted on both sides of the sash they must be of the same length.

The replacement of the sashes will not present any difficulties, as the operations are the reverse to the dismantling processes. In a double window, as shown in Fig. 1, one sash should be finished before tacking a similar window on the other side, in order to avoid confusing the hands or even the sashes. The depressions made by the nails in the fillets may be filled in with putty, which is brought up level with the woodwork. If the work is carefully done a coat of paint will hide any trace of removal or replacement. While the new cord is out it is a good plan to rub it over with linseed oil.

SASH CRAMP. This is a tool used by woodworkers for cramping up a framework of considerable size. All patterns comprise a stiff metal bar having one adjustable jaw, which can be moved along the length of the bar and secured by a tapered peg or wedge. The fixed head comprises a clamp screw, which forces a movable head along the bar.

The work to be cramped is placed between the jaws and the movable jaw secured by the pin on the side of the framework. The screw is rotated and pressure brought to bear upon the frame by means of the sliding head. Generally, two of these cramps are needed for a frame, so that equal pressure may be exerted on each end.



the cord is nearly off it should be finally removed by hand, and a knot tied in it to prevent any risk of losing the end.

Removing the Top Sash. The top sash may now be removed, as in Fig. 3 by prizing away the parting slip. Fig. 4 shows the sash taken out, with the broken cord. An opening at the bottom of the frame is normally covered by a fillet, which has to be removed, but is frequently difficult to find owing to its being covered with paint. A few taps with the hammer will crack the joints, when it may be removed, as in Fig. 5. The weight is disclosed behind this partition, and is then removed, as indicated in Fig. 6.

In order to fit the new cord a length of a more flexible material is first run over the pulley and down the space inside. A piece of chain



Sash. Fig. 1. Set of double windows of which the sashes are to be repaired. Fig. 2. Removing lower sash from framework. Fig. 3. Removing parting slip, after which top sash may be swung out of frame. Fig. 4. Showing broken sash cord. Fig. 5. Removing fillet in frame to give access to weight pocket. Fig. 6. Weight being removed from pocket. Fig. 7. Chain being used to run new cord over pulley. Fig. 8. Method of attaching new cord to weight. Fig. 9. Removing old cord with hammer and cold chisel. Fig. 10. Fixing new cord to sash with nails.

Sash Tool. A special type of brush known as a sash tool is adapted for painting the sashes of windows. See Paint.

SASSAFRAS. The dried root of the sassafras tree contains a volatile oil which gives it an astringent aromatic taste. Sassafras is practically never used internally except as an ingredient of the concentrated compound solution of sarsaparilla. The oil is used to destroy lice and nits, which it does very effectively. It is also used in the treatment of ringworm.

A few chips of sassafras or wood added to ordinary tea are said to have a beneficial result if taken by persons suffering from rheumatism. Sassafras leaves abound in mucilage, and can be used for thickening soups.

SATEEN. Cheap satin that is half silk and half cotton is often called sateen to distinguish it from the more expensive all-silk satin. Cottons made with a satiny face and used principally for linings are called sateens. They show a more or less fine, round twill. They are dyed in a variety of colours, and are also obtainable patterned. Close-woven cotton sateens are suitable for covering down quilts, and the best are exceptionally close-textured, and sold as down proof, implying that the feathers will not work their way through.

SATIN. This fabric has a shiny surface, with a short nap which hides the thread structure more or less completely. Pure silk satin drapes better and is softer to the touch than either cotton backed or artificial silk satin. The last kind is most useful as a furnishing fabric.

Wool back satin is chiefly used for dressing gowns and for frocks and coats for small children.

SATIN FLOWER. The satin flower is a hardy perennial plant, excellent for small herbaceous borders, because of its neat habit,



Satin Flower. Delicate blue flowers and spiky leaves of *Sisyrinchium Bermudianum*

graceful growth, and bright flowers. It has narrow leaves and thickened rootstock.

The best known species is *Sisyrinchium grandiflorum*, with purple or mauve flowers in spring; height about 1 ft.

The white form, *album*, makes charming clumps in the herbaceous border, and is also suitable for the rockery. *S. angustifolium*, with narrow leaves, and pale blue flowers in summer, and *Bermudianum*, blue, is also worth growing.

Satin flower does well in loam with a liberal admixture of leaf-mould and sand. Propagation is by seed and by division in spring.

SATIN WALNUT. This is the name given to the wood of the sweet gum, a common tree in the swampy parts of the lower Mississippi valley, where it grows to a large size; it is also found in most parts of the United States. The tree is similar in appearance to the maple, but it exudes a liquid known as red gum or liquidambar. When cut the timber is of a brown shade, varied at times and occasionally marked with black stripes.

On account of its even, straight texture and the widths in which it can be obtained (up to 18 in. with an average of 14 in.), it is a useful wood for the amateur. It is used for furniture-making, fretwork and wood-turning; it is easy to work, takes a good polish, stains well and forms strong glued joints. The wood is liable to warp and twist, but with proper seasoning this can be reduced to a minimum. In working satin walnut, it is advisable to cut up the material some time before it is planed, but the wood should be kept in a warm room and not allowed to get damp. Satin walnut can be used

for carving or account of its soft cutting and even grain. It is also made up in the form of plywood. See Plywood; Walnut; Wood.

SATINWOOD. The varieties of satinwood are named after the part of the world from which they come. Satinwood is used as a veneer, for small cabinets, in fretwork and inlaying, and for the backs of hair brushes and other fancy articles. In colour it is light orange, and has a close, smooth grain with a lustrous, mottled and satiny surface, and a transparent appearance.

Satinwood works well, but takes glue rather badly, owing to the dense nature of the wood; it polishes well, and a fine finish can be obtained on it. Adam, Hepplewhite and Sheraton used the wood freely, but, owing probably to its scarcity, in small quantities. It was employed in conjunction with mahogany and fancy woods of all kinds, such as amboyna, tulipwood, and purplewood. Designs were often painted on satinwood pieces. When



Satsuma Ware. Vase in modern white Satsuma ware with crackled surface and slightly raised design

the satinwood is carefully selected, however, its beautiful marking or grain requires little or no decoration beyond a banding or border of mahogany. See Marquetry; Pier Table; Sheraton; Veneer; Wood.

SATSUMA WARE.

This is the highest class of Japanese pottery, and as the name is freely applied to the productions of other factories, as well as to modern counterfeits the utmost caution is needed in the purchase of pieces so named.

Some Satsuma ware has an ivory glaze with low-toned pigments, and minute pinnellings in gold. Another type was produced in pure white, with a network of lines in the glaze surpassing the intricacy of Chinese crackle. Some red-clay bodies were decorated with yellow or black monochromes, especially for incense boxes and tea jars. Others were coated with metallic flambé glazes, displaying reds and violets, and other combinations resembling shot silk. A class of *famille* produced during the 19th century is decorated with opulent enamelled colours and gold.

is often vellumlike, or has coloured glazes.

The genuine ware, which is never porcelain, is sometimes claimed to go back to the 15th century. It may be recognized often by the string mark on the base, showing where the piece was detached from the wheel, and also by the fact that the spirals in the paste turn from left to right, because the wheel was rotated by the Satsuma potters with the left foot.

The pieces were always small. Some of the better examples of modern Satsuma are produced in the studios at Kobe and Tokyo, and are highly prized by connoisseurs. These pieces are not to be confused with the regular industry which has existed for many years in Yokohama, Kyoto, Awata, and other pottery centres in Japan, engaged in fabricating for export modern pieces of so-called Satsuma. They can be readily detected by their poor workmanship, their coarse decoration, gilding, large size, and their yellowish tinge. See Pottery.

SAUCES AND SAUCE MAKING

Recipes for Piquant, Savoury, Sweet and Store Sauces

From these foundations most sauces can be made by adding different flavourings and seasonings. See also Apple; Brandy; Bread; Cranberry; Espagnole; Hollandaise; Horseradish; Maitre d'Hôtel; and Mint Sauces. In connection with the Store Sauces, the entries Apple; Chutney; Ketchup; Pickle; Sor; Vinegar, should be consulted.

Sauces, savoury and sweet, are the liquid accompaniments to meat, fish, poultry, vegetables, sweet puddings and dessert. The savoury sauces differ from gravy in that gravy is the juice extracted from the food cooked, sometimes thickened with a little flour, whilst sauce is a mixture of thickened stock or milk and fat, with seasonings added.

There are numerous sauces to serve with all cooked foods, but with the exception of the few which have for their bases oil, wine or vinegar, or fruit (viz. mayonnaise, Hollandaise or mint sauces; apple, cranberry, gooseberry, etc.), they are all variations of two standard foundation sauces—brown and white sauces.

For successful sauce making it is necessary to use the very best ingredients. Margarine

should never be used in place of butter, as it is too oily and does not mix smoothly with the flour. The flour must be a good white, especially for a white sauce, otherwise it will be a dirty, unappetizing colour. It must be quite dry and free from lumps.

Care must be taken not to overcook the fat, as this will spoil the flavour and cause globules of oil to rest on the sauce; it will also be indigestible. The flour must always be blended smoothly with the fat before any liquid is added. Flour must be thoroughly cooked, otherwise the sauce will have a rough, raw taste. All sauces containing flour should be cooked at least five minutes after adding the liquid. For savoury sauces at least half the liquid added must consist of brown or white

stock. Care and judgement must be used in seasonings. Too much will destroy the distinctive flavour of the sauce; too little will make it insipid. The best rule is to taste it during the making.

White and Brown Roux. A white or brown roux is the thickening for white or brown sauces. The roux consists of the first mixing of the flour with the fat. In white roux care must be taken not to cook the flour until it browns; in brown roux the fat and flour are cooked until they turn brown. There are other reasons, or thickenings, for sauces, such as eggs, arrowroot or cornflour mixed with water, or a blend of raw butter and flour, but for standard foundation sauces white or brown roux is generally used.

When sauce is frequently required it is a great saving of time to keep a quantity of white and brown roux ready made. It will keep for weeks if tightly covered. A heaped-up tablespoonful of roux will thicken a pint of liquid. The roux when wanted should be slightly browned by being heated liquid, stirred slowly, stirring until boiling.

To make white roux to thicken half a pint of liquid, weigh 1 oz. flour and 1 oz. butter. Melt the butter in a thick saucepan, and then stir in the flour very gradually. Let it cook for several minutes, stirring all the time, until it becomes a smooth creamy paste, but be careful it does not change colour.

Brown roux is made in exactly the same way except that it is cooked longer to brown the flour, and to hasten this the heat may be increased, though it will need constant watching and stirring. When time is short the flour can be browned first in the oven, but as it burns very quickly it must be carefully watched and turned over to brown evenly. If the roux is for immediate use, the liquid (milk, or milk and water, stock, or stock and water) is added at this stage. Then it is only necessary to add the seasonings and flavourings to achieve the particular sauce you wish to make. All sauces are smoother if strained through a fine pointed strainer, or tannery cloth, unless they contain parsley, carrots, or other solid ingredients that must be kept in.

Unless sauces are served immediately they are apt to go lumpy, stiff, or form a skin on top. To prevent this, and also to keep the sauce hot, the saucepan containing it should be stood in a larger pan containing hot water to come half-way up the saucepan. The sauce should be covered with a lid, and if it is a thick sauce a little piece of butter, or a spoonful of the liquid from which it is made, placed on top of it. This prevents a skin forming, and can be stirred into the sauce before serving. If a bain-marie is available, it is the best means of keeping the sauce hot.

Foundation White Sauce. After making the white roux as above described, add slowly $\frac{1}{2}$ pint liquid (milk or mixture of milk and water, white stock, or fish stock and water). Stir until boiling and cook for five minutes, add salt and pepper to taste, and use.

From this foundation sauce can be made Anchovy, Parsley, and Curry sauces. (See entries under separate headings in this work.) Also Onion sauce (2 large onions, boiled, drained and chopped, added to $\frac{1}{2}$ pint white sauce). Egg sauce (1 hard-boiled egg, chopped, added to $\frac{1}{2}$ pint white sauce). Mustard sauce (2 teaspoonfuls dry mustard added with flour when making roux). Cheese sauce (2 oz. grated cheese added to $\frac{1}{2}$ pint sauce). Celery sauce (add 1 small cooked and chopped head of celery to $\frac{1}{2}$ pint sauce). When white sauces to be used for fish it should be made from fish stock, or half fish stock and milk.

Béchamel Sauce. This is a rich white foundation sauce. To make it, take $\frac{1}{2}$ pint milk or equal parts milk and white stock, or fish stock, 1 oz. butter, 1 oz. flour 1 table-

spoonful cream, a small carrot and same quantity of turnip, 1 small onion stuck with cloves, a few sprigs of parsley and a bay leaf, salt and pepper.

Make the roux with butter and flour. Put milk in a saucepan with prepared vegetables, parsley and bay leaf, and simmer 15 minutes. Then strain, and add liquid gradually to the roux, stirring all the time until boiling. Cook for five minutes more, season well and strain. Re-heat and add cream, and use as required. Use fish stock if for fish.

Melted Butter Sauce. This must not be confused with white sauce. It is a sauce in which butter is the chief ingredient, and is served with salmon or other choice fish, and with some vegetables. To make it, put into a small saucepan 1 oz. butter, melt it and add 1 oz. flour slowly, then add a few upful water and the juice of $\frac{1}{2}$ a lemon. Season with salt and pepper and cook for another five minutes, stirring all the time, then add a little grated nutmeg and 3 oz. more butter. Stir until the butter is melted, but do not boil again. Milk should never be added to melted butter.

Allemande or Yellow Sauce. Half pint Béchamel sauce, yolks of two eggs, 1 tablespoonful cream, 1 teaspoonful lemon juice, pinch nutmeg. Mix the egg yolks and cream together and mix into the Béchamel sauce, away from the heat. Re-heat without boiling, then add the lemon juice and nutmeg. Stir well and serve.

Bearnaise Sauce. Half pint Béchamel sauce, 2 tablespoonfuls vinegar, 2 finely-chopped shallots, $\frac{1}{4}$ oz. butter, 2 egg yolks, $\frac{1}{4}$ table-spoonful stock.

Put vinegar in a small saucepan, add shallots and boil until vinegar is reduced to half. Strain in the hot Béchamel sauce. Beat up the egg yolks with the stock, and strain into the sauce. Whisk over gentle heat until well blended, but do not boil. Remove from heat and mix in the butter a small piece at a time. Season and pour through a strainer. Do not re-heat after adding the butter as it will curdle.

Soubise Sauce. Half pint Béchamel sauce, 4 onions, boiled, well-drained and chopped, 2 table-spoonfuls cream. Mix all well together and re-heat slowly.

Tomato Sauce. Half pound tomatoes, $\frac{1}{2}$ pint Béchamel sauce, pinch sugar. Bake the tomatoes in a gentle oven until soft, rub through a sieve and add the pulp to the hot Béchamel sauce. Add about half a teaspoonful sugar, stir well and re-heat.

Velouté Sauce. Half pint Béchamel sauce, 1 teaspoonful lemon juice, $\frac{1}{2}$ bay leaf, 4 peppercorns, 1 table-spoonful cream. Simmer the Béchamel sauce with the bay leaf and peppercorns for 10 minutes, strain and return to the pan to re-heat. Add the lemon juice and still in the cream, re-heat, but do not boil.

Shrimp, Oyster, Lobster and Crab sauce are made from velouté sauce made with fish stock. Add 6 chopped oysters, or 2 oz. chopped lobster or crab, or a gill of picked and chopped shrimps to $\frac{1}{2}$ pint velouté sauce, as required. A little lobster butter added to lobster sauce is an improvement. (See Lobster.)

Foundation Brown Sauce. This is the ground work for many savoury sauces. Take 1 oz. butter, 1 oz. flour, $\frac{1}{2}$ pint brown stock, 1 small onion, piece of carrot and turnip seasoning.

Make the brown roux as described. Fry onion lightly and add to roux. Add stock away from heat, then add the chopped vegetables and seasoning, simmer for half an hour, then strain and make thoroughly hot to serve.

Chasseur Sauce. This rich brown sauce served with venison, is made by boiling together $\frac{1}{2}$ pint brown sauce with 1 gill port wine, 2 oz. red currant jelly, 1 oz. glaze, a squeeze of lemon juice and a dash of cayenne. When liquid is reduced to $\frac{1}{2}$ pint, strain and serve.

Chestnut Sauce. This is made by adding $\frac{1}{2}$ pint blanched, boiled and mashed chestnuts to $\frac{1}{2}$ pint brown sauce. Mix smoothly and make thoroughly hot before serving.

Piquant Sauce. Espagnole (q.v.) or brown sauce forms the foundation of this sauce. Simmer together 1 gill vinegar, 1 dessert-spoonful chopped onion or shallot, 2 table-spoonfuls each chopped capers and gherkins. When the onion is tender, and the vinegar reduced to about half its original quantity, pour in 1 pint Espagnole sauce, boil up, and if necessary add more seasoning. Just before serving stir in 1 table-spoonful chopped parsley.

Genevoise Sauce. This is a rich brown fish sauce. Add 1 glass Madeira or sherry, and a few drops each of garlic vinegar, lemon juice, and anchovy essence to 1 pint Espagnole sauce. Re-heat the sauce, season it, and at the last moment whisk in $\frac{1}{2}$ oz. fresh butter, adding it in small fragments. Do not let the sauce re-boil.

Mushroom Sauce. Add $\frac{1}{2}$ lb button mushrooms tossed in hot butter to $\frac{1}{2}$ pint Espagnole or brown sauce.

Reform Sauce. To make it, take $\frac{1}{2}$ pint Espagnole sauce, $\frac{1}{2}$ gill vinegar, 12 peppercorns, 1 teaspoonful red currant jelly, 14 gills port wine or claret, cayenne pepper. Add peppercorns to vinegar, and boil until reduced to half quantity. Stir in jelly, wine and a few grains cayenne. Cook slowly for 10 minutes, add Espagnole sauce, strain, re-heat and use.

Sweet Sauces. There is a great variety of sweet sauces to be served with boiled, steamed or baked puddings, etc. Those most in everyday use are custard sauce (see Custard) and sweet white sauce, which is an ordinary white foundation sauce sweetened with 2 table-spoonfuls sugar to the $\frac{1}{2}$ pint.

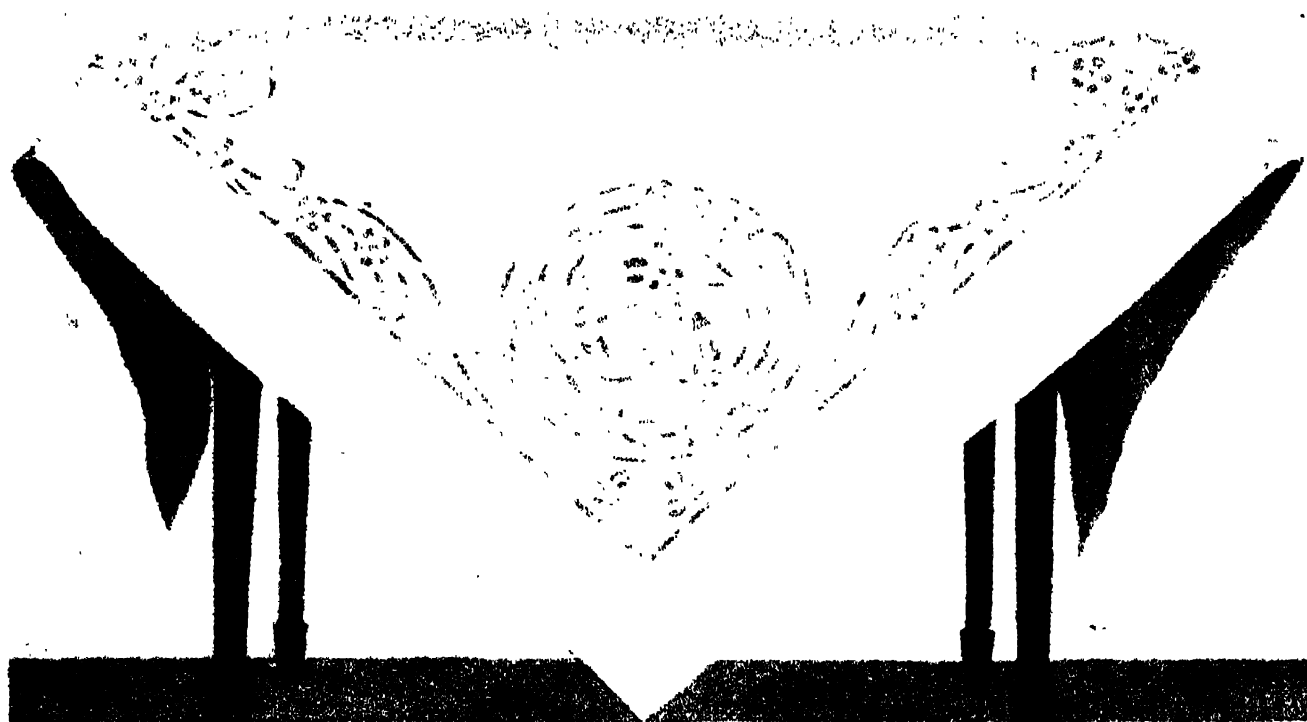
Jam sauce is made by boiling together 2 table-spoonfuls jam, $\frac{1}{2}$ pint water, and a few drops lemon juice until reduced to two thirds. Strain and serve. Marmalade sauce is made in the same way, omitting the lemon juice. Fruit sauces though classed as sweet are often served with meat and fish; e.g. apple sauce, cranberry sauce with pork and turkey, and green gooseberry sauce with boiled mackerel. Treacle sauce is made by boiling together 2 table-spoonfuls syrup or treacle, 1 gill water, 1 teaspoonful lemon juice, until reduced to two thirds. Thicken with 1 table-spoonful cornflour. For lemon sauce add a table-spoonful loaf sugar to a breakfastcupful boiling water, having first rubbed two lumps over the rind of a lemon. Mix a dessert-spoonful cornflour with a little cold water, and stir into the sugar and water. Bring to the boil, stirring all the time. Add the juice of a lemon, stir well, and serve. Orange sauce is made in the same way, using half the quantity of sugar.

Gooseberry Sauce. Top, tail, and wash a pint green gooseberries, and put them in a pan with a gill of water. Simmer until fruit is soft, rub through a sieve and put into a clean pan. Add 1 oz. butter, 2 oz. sugar, a pinch grated nutmeg, and re-heat. A few drops of green colouring may be added.

Chocolate Sauce. Two ounces grated chocolate, 1 oz. castor sugar, $\frac{1}{2}$ teaspoonful vanilla essence, $\frac{1}{2}$ pint water, 2 table-spoonfuls cornflour. Boil sugar, water and chocolate together for a few minutes. Blend cornflour with a little water and add to chocolate mixture. Stir until boiling, add vanilla, and use.

Hard Sauce. A quarter pound fresh butter, 6 sweet almonds, 2 bitter almonds, 2 oz. castor sugar, 1 table-spoonful sherry, $\frac{1}{2}$ table-spoonful brandy. Blanch, chop and pound the almonds to a smooth paste. Cream the butter and sugar, add the almonds. Add the sherry and brandy, mix well and serve hot.

Store Sauces. Besides the savoury and sweet sauces that are made for immediate use there are a number of piquant sauces or relishes



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STRENGTH AND SIMPLE DISLOCATION WITH MANY APPLICATIONS

[illegible]

that can be stored to use for cold meat, fish poultry, etc. All these take a long time to make, and great care and patience are needed. The best ingredients must always be used.

Harvey Sauce. One quart best vinegar, 3 or 4 anchovies, 1 tablespoonful soy (Indian or Japanese soy can be bought ready prepared for use), 1 tablespoonful walnut ketchup, a grated shallot, a grated clove or garlic, $\frac{1}{2}$ oz. cayenne, few drops cochineal. Place all the ingredients in a wide-necked, unglazed jar, and cover closely. Let it stand for 14 days, stirring it once a day. Then strain off into bottles, cork well, and store in a cool place.

Tomato Sauce for Bottling. Bake as many tomatoes as are available in a slow oven until soft. Then rub through a sieve and measure the pulp, and to every quart allow 1 pint chilli vinegar, $\frac{1}{2}$ pint soy, 1 tablespoonful anchovy essence, 2 grated shallots, 1 grated clove of garlic, salt to taste. Put all ingredients in a stew pan and simmer until shallots and garlic are tender. Then pass through a fine hair sieve, and store in airtight bottles.

Worcester Sauce. One quart best malt vinegar, 6 tablespoonfuls walnut ketchup, 4 tablespoonfuls essence of anchovy, 4 tablespoonfuls soy, 4 grated shallots, salt to taste. Put all ingredients in a wide-necked unglazed jar, cover closely. Stir the contents 3 or 4 times daily for three weeks, then strain off into small bottles, cork, and store in a cool, dry place.

Thick Piquant Sauce, or Chutney Sauce. One pint vinegar, 2 tablespoonfuls mushroom ketchup, 2 tablespoonfuls soy, 4 dessert-spoonfuls chopped pickled walnuts, 2 dessert-spoonfuls chopped chutney, $\frac{1}{2}$ oz. bruised garlic, 7 or 8 finely chopped anchovies. Mix all ingredients together in a wide-necked jar, let it remain in a warm place for a month. Give the contents a good stirring daily. Pour off into small bottles, cover securely, and store in a cool, dry place.

SAUCE BOAT. There are two main types, and one of each kind is usually included in a dinner service. One is fitted with a lid and ladle and a stand to match, making it in effect a small tureen. The other is the sauce boat proper, with lip and handle made so that the liquid can be poured out as from a jug; of this kind there are some beautiful examples in silver and Sheffield plate.

Silver and Sheffield plate sauce boats made in the 18th century are valued by collectors. They are usually of the conventional shape, but with a variety of decoration on the handles and the feet, and sometimes round the rim. The supports are in several styles, some having a plinth and others having claw feet. Less frequently seen are oval boats with two lips.

SAUCEPAN. Enamel saucepans are very easily kept clean, but should always be of good quality, or the enamel is liable to crack

and small chips find their way into the food. Iron saucepans are chiefly needed where there is a range and are used for boiling vegetables, for certain stews and boiled puddings. They are too heavy for ordinary use. Stainless steel saucepans afford excellent wear, but are expensive to buy.

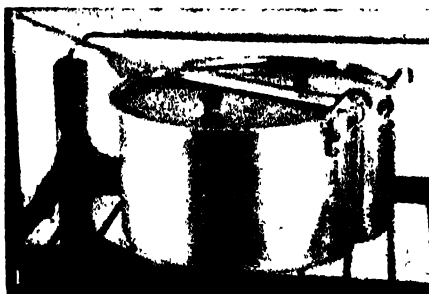
Copper saucepans are good conductors of heat but require to be lined with tin or nickel, as these metals are not chemically acted upon by acids. Aluminium pans are most generally used, as they are light and easily cleaned. Most of the newer types of fuel and space saving saucepans are made in this metal. Figs. 1 and 2 illustrate examples of these pans, which are helpful on a small cooker.

Double saucepans for heating porridge, milk, etc., are made in both enamel and aluminium ware. A modern development has a lip through which water can be poured to keep the milk, custard or sauce in the upper part from burning. Another saucepan which is useful for milk has a patent lid through the sides of which the milk can bubble and return through the centre without boiling over.

Vegetable saucepans comprise in with a wire cage, which when lifted up strains



Fig. 3. Wooden rack for holding saucepan lids



Saucepan. Fig. 1. Saucepan made up of two semicircular pans which can be used separately or together over one burner. Fig. 2. Four square aluminium saucepans of different sizes, but made to fit together so that they can be used as a light

the peas, beans, etc., so that the water runs back into the pan. Another device has a special lock lid and a series of holes on one side so that vegetables can be strained without a colander after they are cooked. A dual purpose saucepan possesses a movable handle and a lid which can be converted into a frying pan by transferring the handle to it.

Cleaning Saucepans. Saucepan lids should be thoroughly cleaned and dried to keep them free from rust. As the cover should always be removed when not in use, a saucepan lid rack is illustrated in Fig. 3,

which has proved a convenient little accessory when placed near the cooker. Tied metal saucepan racks which admit a free passage of air to the saucepans take up little room in a corner.

Saucepan brushes are sold in sets to hang up over the draining board. These can be used with cleaning and scouring solutions for removing hard deposits of grease and food from saucepans. Wire brushes should not be used for aluminium ware, which should be scoured with sand and rinsed and dried thoroughly. No soda should be used in cleaning aluminium pans or added to food cooked in them, as it turns them black. Food should not be allowed to stand all night in any saucepan. New pans should be filled with cold water, brought to the boil, emptied, rinsed out in clear water and thoroughly dried. Iron and enamel saucepans may be washed with soapy water to which soda has been added. See Aluminium, Copper, Kitchen.

SAUERKRAUT. Cabbage which has undergone fermentation can be purchased ready for cooking under the name of sauerkraut. This is served usually with sausages, ham or boiled bacon.

The French way of preparing this dish is without pickling and fermenting the cabbage. Wash and shred the white hearts of two cabbages very fine, removing the hard parts. Now wash the shred thoroughly, using several waters, and drain them quite dry. Put the shreds into an earthenware pan with about 4 tablespoonfuls salt, add 8 pepper-corns and a breakfastful white wine vinegar. Stir the cabbage well in the vinegar and let it remain for some hours. It might, if more convenient, be soaked overnight and used next day. Wash it well before cooking, then put it into a cass-rol with 1 pint stock, $\frac{1}{2}$ lb. sliced fat bacon. Bring gently to the boil and simmer till the cabbage is tender. Add to the stock when cooking it a tablespoonful of vinegar.

SAUMUR. The delicate French sparkling white wine known as Saumur is an excellent substitute for champagne. It is sound, so delicate and light.

SAGE: To Make and Cook. Sausages should always be purchased from a dealer, and as many sorts are available, as well as beef or pork, they should be cooked as soon as possible. To prevent the skins from bursting, they should be pricked with a fork, but there is less danger of the skins bursting if the sausages are stretched or scaled before being fried. Cook them slowly, in fat, turning them frequently until they are nicely browned. Serve them, alone or with bacon, or with mashed potatoes, or on fingers of fried bread or toast. Sausages can also be roasted or grilled before a clear fire or under a gas grill.

The usual method of making sausage consists in passing the meat through a mincer and forcing it into the skin or casing. The meat may be passed through the mincer twice. Have ready a well cleaned sausage skin, fix it on to the machine or hold it open and force the meat into it, then separate the sausages by twisting the skin at intervals of 4 in. Only fresh meat should be used, all skin and gristle being removed and a proportion of fat added. The meat is then cut into dice, bread crumbs mixed in if desired, together with seasoning according to taste.

Pork sausages should be flavoured with sage; beef, onion and sweet herbs, veal and ham, lemon and sweet herbs, for mutton a stronger flavouring will be necessary, and a small proportion of suet and breadcrumbs must be added. The flavouring may consist of shallots, anchovies, pepper, salt, and wine.

Sausage Meat. The forcemeat for wild game is used in making poultry and turkeys. To prepare it, skin 1 lb.

put the meat into a basin, and mix it with 5 oz. breadcrumbs, a pinch of powdered mace, and salt and pepper to taste, binding the whole with the beaten yolk of an egg. The finely chopped liver of a turkey can be added if desired. This forcemeat can also be made into balls, rolled in flour, and fried or baked.

Sausage Roll. To make sausage rolls, skin 1 lb. pork sausages, divide each into three portions, and put them on one side. Make $\frac{1}{4}$ lb. flaky pastry and roll it out $\frac{1}{4}$ in. thick, and cut it into pieces about 4 in. square. Turn these over to the other side, and roll the pieces of sausage into thinner rolls, not quite so long as the pieces of pastry. Place one on each piece, damp round the edges of the pastry, and fold it over in half. Press the edges together, trim off any rough pieces, and with the back of a knife make two slits in the top.

Brush the rolls over with beaten egg or a little milk, put them on a baking sheet in a hot oven and cook them for about 30-40 min. When the pastry is cooked and of a golden brown colour, the heat of the oven can be reduced, and, if necessary, the browning shell can be removed. When cooked, let the rolls cool on a sieve. See *Hors d'Oeuvres*, Pastry; Stuffing.

SAUTÉ. This French word means tossed. It is a method of cooking food that resembles frying, and is sometimes known as French frying. It differs from real frying in that less fat is used. Consequently the food so cooked should be turned or tossed frequently to prevent it from burning or sticking to the bottom of the pan. See *Potato*.

SAUTERNE. The white wine produced at Sauterne in the Gironde, France, is made from white grapes which are picked over ripe, and is considered the finest of all naturally sweet wines. The best and most widely known sauterne is Chateau Yquem, the most delicately aromatic of wines in France, and probably in the world. It has a colour resembling liquid gold, with exquisite bouquet and flavour. Barsac is not so sweet and has a flavour of its own. Sauternes are usually served with fish and poultry, but may be drunk throughout a meal. See *Dinner*, Wine.

SAVELOY. A savoury kind of sausage often served as hors d'oeuvres, the saveley differs from the ordinary pork sausage mainly because the pork used in its preparation is salted. When bought ready-made, it is thoroughly cooked, and served cold. It is covered in a bright red skin, which should be pulled off the slices before they are eaten.

SAVINGS BANK. In Great Britain, savings banks, which differ from ordinary banks in receiving money on deposit only, not on current account, are of two main kinds. These are: the savings bank conducted by the state through the post office; and the trustee savings banks over which the state exercises supervision. In addition, the joint-stock banks have departments for receiving savings, and in one or two places, notably Birmingham, municipal banks have been opened. There are also savings banks in connexion with industrial concerns and the Services, and a number of schools have them. Some of these are worked in connexion with the post office. Canada, Australia, and other parts of the British Commonwealth also have savings banks under state control.

All these banks receive money on which they pay interest. Deposits can be withdrawn at any time, usually after a very short notice. The rate of interest paid is usually low; in the post office savings bank it is only 6d. in the £ for the year, or 2½ p.c. Where security of capital is essential, banks that offer a high rate of interest should be avoided.

To open an account in a savings bank it is only necessary to fill up certain forms and

deposit a sum of money. The post office will not take sums of less than 1s., but penny banks and some others take from a penny upwards. Each depositor is provided with a book, which must be presented when money is deposited or withdrawn, and should be sent to the bank once a year in order that any interest which has accrued can be added.

As regards the post office savings banks the following conditions are laid down. An account can be opened for, or by, a person of any age, but if it is for a child under seven the money deposited cannot be withdrawn until the child is seven years old. Deposits in these banks cannot be attached in case of debt. A depositor may have more than one account in the Post Office Savings Bank, but the total amount which he may deposit in a year ending December 31 is limited to £500. The total amount in credit to an individual depositor must not exceed £2,000. A depositor may act as trustee in accounts for the benefit of others.

Money can be deposited at any post office savings bank, and if it is for more than £50 a receipt will be sent from the head office. Otherwise the stamp and signature in the depositor's book is the only receipt. On presenting his deposit book at any P.O. savings bank a depositor can withdraw on demand any sum up to £3. If more than £3 is required, a form of notice of withdrawal must be filled up and posted to the Controller, Post Office Savings Bank, London, W14. These forms can be obtained from any post office savings bank.

The depositor receives a warrant for the amount, and he can get the money by taking this, with his book, to the post office named in his form of withdrawal. Sums up to £10 may be withdrawn by telegraph, on application at a post office savings bank which accepts telegrams and on payment of 1s.

If a depositor wishes to authorise another person to receive payments from the bank on his behalf, he can sign a form for that purpose. Forms of application for claiming the deposits of deceased persons are obtainable at a post office. A depositor not under the age of 16 may nominate a person or persons to receive any sums from the amount due to him at the time of death.

SAVINGS CERTIFICATE. National Savings Certificates, formerly known as War Savings Certificates, offer a means of investing small sums in a government security bearing interest free of income tax. The present issue, which is known as the ninth, was begun on February 1, 1951. The purchase price for a single certificate is 15s., and the certificates are repayable at any time on application, together with any interest which has accrued. A single certificate of the ninth issue becomes worth 20s. 3d. at the end of 10 years. National savings stamps of the value of 6d., and cards to which they can be affixed, are obtainable.

Special facilities for the accumulation of small sums for investment in national savings certificates are also provided, by savings associations established under the auspices of the National Savings Committee, 39, Hyde Park Gate, London, S.W.7, and the Scottish Savings Committee, York Buildings, Edinburgh, 2, who will give information and advice.

No person or body of persons or institution authorised to purchase national savings certificates may either individually or jointly hold or have any interest in more than 500 single 15s. certificates, or other equivalent in multiple certificates. A person becoming entitled on the death of another person to certificates which bring his holding above that number may, however, retain the excess, but may not purchase more. Certificates may not be mortgaged as security for a loan.

Interest. Threepence interest is added to each unit at the end of the first year. During the second year, 1d. is added at the end of each

completed period of two months; and during the third, fourth, fifth, sixth, and seventh years, 1d. is added at the end of each completed period of two months. Thereafter, 1½d. is added at the end of each completed period of two months until the end of the tenth year, when each unit will be worth 20s. 3d.

Certificates may be obtained in denominations of 1, 2, 3, 4, 5, 10, 20, 50, and 100 units at the purchase price of 15s. per unit. Interest is free of income tax and surtax in Britain. Loss of certificates should be reported, with their serial numbers and holder's registered number, to the Post Office Savings Bank Department, Somerset Street, London, W.1. If the certificates are not found within three months, duplicates will be issued at an inclusive fee of 1s.

Repayment. Repayment with accumulated interest may be obtained at any time on written application by the registered holder to the Controller, Money Order Department, General Post Office, London, except in the case of a child under seven years of age. Forms of application for repayment can be obtained at most post offices.

SAVOY: The Plant. Both summer and winter savories are used as potherbs, for flavouring soups and sauces. The summer savory, *Satureia hortensis*, is an aromatic annual, raised from seed sown in April in drills 6 in. apart, in rich soil in a sunny position. When the plants are 2 in. high they should be thinned to 6 in. apart in the drills. When the plants begin to flower they should be pulled up and dried, for winter use.

The winter savory, *S. montana*, is a perennial. It thrives in any ordinary garden soil in a sunny position. It can be planted in spring or in autumn, about 1 ft. apart in rows 1 ft. apart. Propagation is by seeds, and by cuttings. Shoots are gathered at flowering-time and dried, for use during winter.

SAVOURY: The Dish. A highly flavoured side dish, known as a savoury, is served after the sweet, or may take its place when the dinner is informal. Savouries can be of fish, game, white meats, dressed vegetables, or some preparation of cheese or eggs. They are frequently served in chimneys, and ramekins, or they can be dished altogether in silver or fire-proof dishes.

Sometimes the savoury is of a very simple nature, such as Scotch woodcock, or mushroom toast; at other times it may be more substantial, a cheese soufflé or dressed tomatoes; but it is always chosen to contrast with the entrée. It is really a substitute for cheese after a meal. In summer it is often served cold. See *Anchovy*; *Aspic*; *Cheese*; *Tonno*, etc.

SAVOY BISCUIT. Savoy biscuits are used in the making of many fancy sweets. These biscuits can be laid out on a sheet of cartridge paper by the aid of a savoy bag, and baked in a fairly hot oven. Or bake them in sponge finger tins which have been floured and sugared.

The ingredients and proportions to be used would be 3 eggs to 6 oz. caster sugar and 8 oz. flour. The eggs should be whisked stiffly for about ½ hour with the sugar, then folded in quickly with the flour and a little delicate flavouring, such as vanilla, added last; then place the mixture in a savoy bag to shape for baking.

SAVOY CABBAGE. A valuable hardy autumn and winter vegetable which is raised from seeds sown out of doors in April and May; it produces a large firm head of deep green, crinkled leaves. The seedlings should be planted out in summer, the large varieties at about 20 in. apart, the small ones at 12 in. apart. Of the large Savoy, suitable sorts are Drumhead, and New Year; of the small ones, Dwarf Green Curled, and Little Gem. For methods of cooking see *Cabbage*.

SAWS: THE VARIOUS TYPES

Their Different Uses and How to Sharpen Them

Other information on this subject will be found in the articles on the various kinds of saw, e.g. Bow Saw; Cross Cut Saw; Frame Saw; Hack Saw; Keyhole Saw. See also Amateur Carpentry; Tools; and the entries on the woodwork processes in which the use of the saw is essential, e.g. Dovetail; Joint Mitre; Picture Frame.

The cross-cut saw is used for cutting across the grain of wood, while a rip saw works along the grain. The average length of the cross-cut hand-saw is about 26 in., and the number of teeth to the inch depends on the work for which it is intended. The tenon or back saw, Fig. 1, is 12 in. to 18 in. in length, and the number of teeth to the inch about 10. The top edge has a strip or back of grooved steel or brass, fitting the blade, and giving strength and rigidity.

The panel saw is a small hand-saw with fine teeth that may be used for the same purposes as the cross-cut and ripping saws, and also as a tenon saw and for many wood-sawing jobs. The amateur who wants a general-purpose tool is advised to buy this type. The dovetail is similar to the tenon, but smaller and with finer teeth; its usual length is 10 in. It is used in making dovetail and other joints that entail very accurate work. For cutting bending and similar small work a light brass-backed saw is often used with a straight handle, like that of a Bradawl.

For cutting shaped outlines in wood a bow saw is usually employed. The frame is generally of beech and the handles and blades can be

The two chief rules for accurate sawing are to use long strokes, and not press too heavily. Any attempt to force the saw too quickly through the wood will make it more difficult to guide for one thing, and for another it will make the blade jam, the teeth not being able to clear themselves properly. Draw the saw slowly backward and forward and the work will be done more quickly and with less labour. About sixty strokes a minute with a 26 in. saw is right.

When sawing off a piece from a long board, both ends of the latter should be supported, and the board so kept horizontal. To use only one support and hold the board horizontal by the pressure of one knee is bad, because the board is bound to vibrate, and the sawing will probably be uneven, because the attention of the worker is divided between it and the support of the board. When a long board has to be sawn across the middle, it is best to have an assistant holding it to prevent the board sagging and so binding the saw blade. During the last few strokes, when cutting a short or long piece, it should be supported, or it will break away and split the end of the board. The last few strokes of the saw should

be as lightly made as the first, to prevent the breaking away of the fibres of the wood at the corner. Short pieces of board may be held in the bench vice, as in Fig. 3.

With a tenon or similar saw nearly all the work is done on the bench. The sawing should be done against the bench stop, or by using a bench hook, as shown in Fig. 1. The bench hook is hooked against the front of the bench, and the wood to be sawn is pressed firmly against the top of the hook with the left hand.

Considerable practice is required to saw a straight line and to saw squarely, particularly when using the cross-cut saw on thick stuff. A saw may be following the line marked on the top of the material, and yet be considerably to one side of it underneath. The tendency generally is to incline the handle end of the saw towards the side on which the worker is standing. By giving what appears to be a contrary slope it will generally be found that the wood is being cut squarely, and a little practice will enable the amateur to keep his saw cuts square.

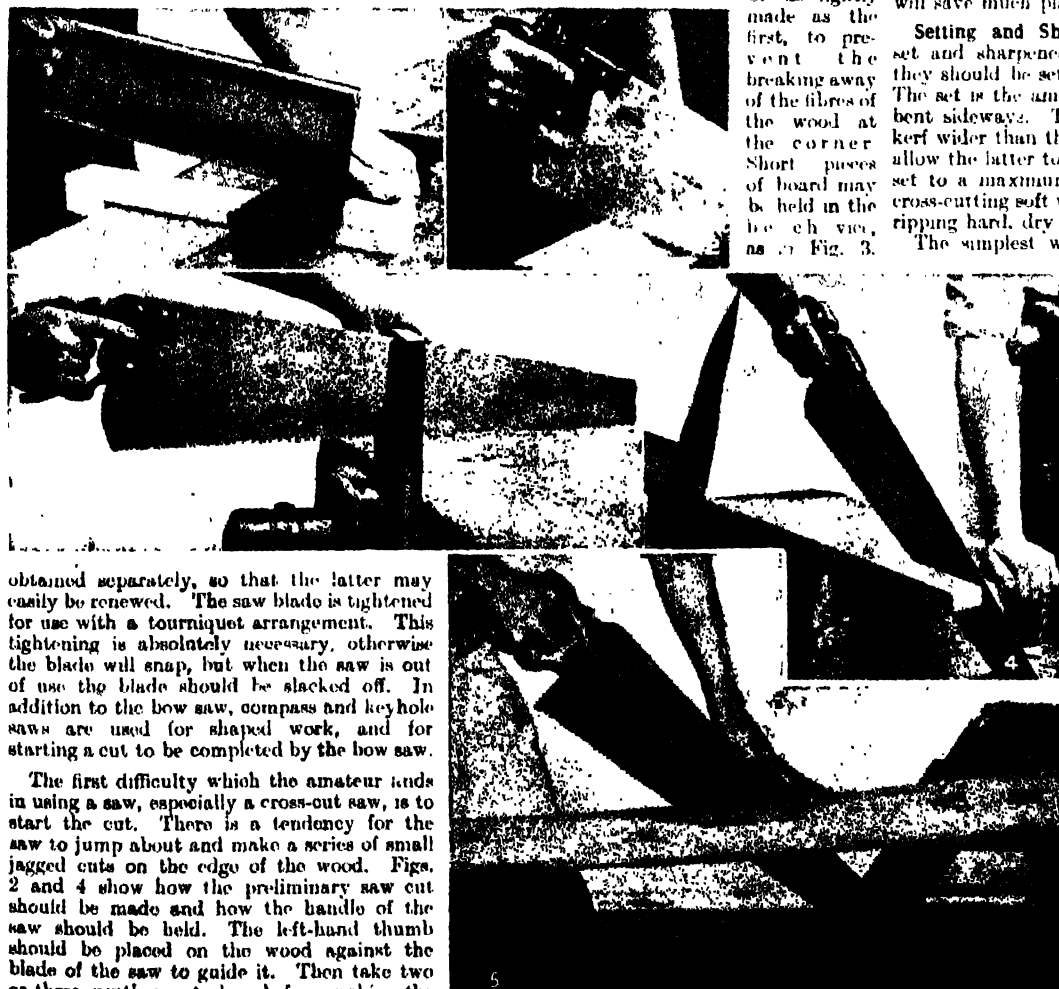
A saw may persistently saw to one side on a line when all the rules of sawing have been observed. This will be due to a defect in the saw itself. Either the blade has twisted or the teeth of the saw have been set more on one side than the other.

A point the amateur often overlooks is the waste which occurs when a saw cut is made. A board 1 ft. in length when sawn exactly through the middle does not produce two pieces each 6 in. long. Each piece is 6 in. less half the width of the saw cut or kerf. When careful work is being done this width becomes important, and must be allowed for when cutting. Saw on the outside of the line, so that the saw kerf is in the waste piece of wood. This will save much planing and fitting.

Setting and Sharpening. Saws should be set and sharpened at regular intervals, and they should be set before they are sharpened. The set is the amount to which the teeth are bent sideways. This is to make them cut a kerf wider than the thickness of the blade to allow the latter to run freely. Saws should be set to a maximum for cutting wet wood, or cross-cutting soft wood, and to a minimum for ripping hard, dry wood.

The simplest way of setting a saw is by means of a hand-set, Fig. 6, with the saw held in a vice. The hand-set contains a number of slots or notches of various sizes to suit different thickness of saws. A slot is fitted over a tooth, and the latter then bent over to the required angle. Alternate teeth are bent over on one side of the blade, and the remainder on the other. The accuracy of this method depends largely upon the eye of the worker, and a hand set with a gauge attachment is best for the beginner. When the tooth is bent over sufficiently the gauge just touches the blade of the saw and this ensures that the teeth are set uniformly. There are other types of saw-set on the market. Professional saw sharpeners place the saw on a metal block with bevelled edges, and strike the teeth with a saw-setting hammer.

Saws are sharpened by filing the teeth with a three-cornered file. A proper and suitable saw file has the same section as the tooth space,



Saw. Fig. 1. Tenon saw in use on work supported by a bench hook. Fig. 2. Making the preliminary cut with a cross-cut saw. Fig. 3. Short board held in bench vice. Fig. 4. Correct position to adopt when cutting a thick plank. Fig. 5. Ripping a long board through the centre

obtained separately, so that the latter may easily be renewed. The saw blade is tightened for use with a tourniquet arrangement. This tightening is absolutely necessary, otherwise the blade will snap, but when the saw is out of use the blade should be slackened off. In addition to the bow saw, compass and keyhole saws are used for shaped work, and for starting a cut to be completed by the bow saw.

The first difficulty which the amateur finds in using a saw, especially a cross-cut saw, is to start the cut. There is a tendency for the saw to jump about and make a series of small jagged cuts on the edge of the wood. Figs. 2 and 4 show how the preliminary saw cut should be made and how the handle of the saw should be held. The left-hand thumb should be placed on the wood against the blade of the saw to guide it. Then take two or three gentle up-strokes before making the first down or forward stroke. The pressure should be as light as possible. The preliminary cut made, the sawing can proceed.

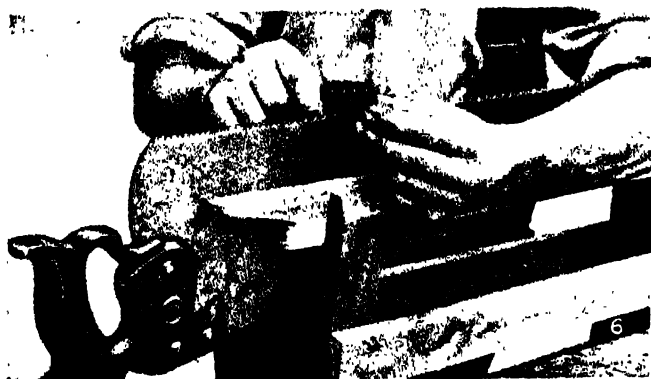


Fig. 6. Setting the teeth of a saw with a hand saw set. Fig. 7. Showing correct method of using the file in sharpening a saw.

and thus files the front of one tooth and the back of the preceding one simultaneously. Such files are made in various sizes, a 4½ in. file being suitable for band saws and a 3½ in. for tenon saws. The saw should be held, teeth upward, in a long-jawed vice the teeth projecting only slightly above the jaws. A simple wooden vice can easily be made by the amateur. The jaws should be faced with a thickness of leather. The appliance has legs to stand on the floor against a bench or table and thus bring the tool to a convenient height for the work. Another way is to clamp the saw between two pieces of wood the length of the saw.

Before beginning, look along the top of the teeth and see that they are in a straight line. With a blunt saw it will be found that they are uneven, and the first thing to do is to straighten them. This is done with a flat file run over the points of the teeth. To ensure accuracy, fit the file in a groove in a piece of wood. The latter held against the saw blade acts as a guide and enables all the ends of the teeth to be filed with a perfect regularity.

The saw should be sharpened from the handle end. The file is held on a slight slope to the horizontal, as in Fig. 7, not more than a few degrees, and its direction should be at an angle across the teeth, not at right angles. Two or three strokes of the file will suffice to sharpen each tooth, and the file should only be used on the forward strokes. The back of the tooth is filed to bring it to a sharp point again, though the front of the next tooth to the right gets filed away to some extent. When one set of teeth has been filed the saw should be turned over and the other set similarly treated. The file should still slope towards the handle when the saw has been turned.

The angle at which the file is pointed across the teeth varies with each type of saw. In the case of a rip saw the file is only just off the square, with a cross cut, tenon or panel saw it is at about 20° to 30°. The more the filing is done out of the square the finer the point and the keener the cutting. Naturally the teeth are weaker, and saws thus will want more frequent sharpening. Generally speaking, sharpen finely for soft woods and squarely for hard woods.

Saws when not in use should be thoroughly greased to protect them from rust. A grooved piece of wood the length of the saw should be prepared, and kept over the teeth when the saw is not in use. To make such a cover, the grooved edge of a piece of stout matching can be ripped off to a width of about 1½ in. A couple of holes are bored to take a cord for tying it to the saw.

SAWFLY Various kinds of sawflies are very troublesome in the garden, attacking

apples, cherries, larch pears, pinea plums, raspberries, roses, turnips, and other trees and plants. The larvae of leaf feeding kinds should be picked off by hand, or as an alternative, should be destroyed with sprinklings of the poisonous hellebore powder.

Pith-boring grubs can only be eradicated by removing and burning the tree that withers suddenly. Cater-

in gritty soil containing lime, in sunny rock crevices. Most of them have grey-green leaves, and in May and June the dainty panicles of bloom are delightful. A few of the best are azoon and its varieties, cochlearis, white; Kolenatiana, pink; lantoscena superba white; Macnabiana, white with red spots; Hostii, cream with pink spots; and Tumbling Waters, white. Longitola bears immense panicles of white flowers, but the plant dies after flowering.

A few of the most attractive saxifrages in the remaining groups are apiculata, yellow; burseriana gloria, white; trisbaehni, crimson; Iremgii, pink, and oppositifolia, rose-purple. These, which flower early in spring, should be planted in very gritty soil or in the moraine London guide, so useful as an edging to shady borders is Saxifraga umbrosa, it bears pinkish flowers profusely in May. Saxifraga ligulata and cordifolia are vigorous plants with large leaves and spikes of rose coloured flowers in spring.

The usual way of propagating saxifrages is by detaching offsets, potting them in small pots of gritty soil and keeping them in a frame until they are well rooted. They may also be raised from seeds sown in pans of fairly sifted sandy soil placed in a frame in spring, but the seedlings grow slowly.

SCABIES: The Disease. The skin disease popularly known as the itch is due to the presence of the female itch mite, which forms winding burrows in which she lays her eggs, her position being indicated on the surface by a small vesicle or blister. There is intense itching, increased when the sufferer is warm in bed at night, and from scratching and other irritation a sepsis results.

Treatment consists in anointing the body from the neck downwards with sulphur ointment on three consecutive nights. The fourth night a hot bath is taken, and the patient gets fresh underclothing. What he has been wearing may be sent to a steam disinfecter, be boiled at home, or things which would damage may be soaked in a solution of lysol.

The Disease in Poultry. A form of scabies, called plumbeus scabies, attacks fowls. It takes the form of feather eating, and is usually due to the small mite at the roots, but sometimes to lice. There are two kinds of feather plucking, the eating of the bird's own feathers and the plucking of those of other birds. The disease appears usually about April, and is most prevalent in the spring and summer. Besides the loss of feathers the birds become thin and lay fewer eggs or none at all.

To cure the disease it is first necessary to isolate the affected bird or birds. The mites yield readily to treatment if oil of cloves is rubbed into the infected area, but a mixture of one part of creosote to 20 parts of lard is perhaps a better remedy. Another remedy is to wet the base of the feathers with soapy water, and then dust the birds with fresh pyrethrum. See Gapes: Poultry.

SCABIOUS. The pincushion flower or scabious is a delightful plant for the garden. There are perennial and annual kinds. The flowers of the latter are of various colours, crimson, maroon, lavender and pink. Seeds should be sown under glass in March, and the seedlings planted out of doors in May; these plants may be treated as biennials, seeds being sown in summer and the seedlings set finally in autumn, when they will bloom the following year. The ordinary varieties reach a height of 2-3 feet, the Tom Thumb varieties 12 inches.

The finest perennial kind is the Caucasian scabious (Scabiosa caucasica), which bears long stemmed lavender-blue flowers of great value for cutting. It thrives best in well-drained soil. On heavy land it is liable to perish in winter and there should be grown as



Saxifraga. One of the large-leaved saxifrages, ligulata, which bears rose-purple flowers.



Scabious. Flowers of the annual scabious, varying from a deep wine colour to pale blue

a biennial from seeds sown every year in May. Propagation may also be effected by division in September.

SCAFFOLDING: In Building. By scaffolding as applied to building works is meant the temporary structure raised to varying heights to enable those employed on the job to work in comfort, and to support the materials which are being used for the structure.

The bricklayer's scaffold is the type used generally to assist in the erection of small houses, and it is made up with a number of members that are given different names, according to the position into which they are placed. The poles that are fixed in the ground are called standards. These are fit poles stripped of their bark, 4 or 6 in. in diameter and 25 to 30 ft. long. If longer poles are required two are lashed together. The hole dug for the standard is about 2 ft. in diameter and 2 to 3 ft. deep. Where it is not desirable to break the surface of the ground, the standards may be placed in tubs or boxes containing sufficient earth. The firm planting of the standards gives lateral strength to the scaffold.

The ledgers are horizontal poles fixed to the standards by means of scaffold cords or lashes; they are placed at the height required for comfortable working, from 4 ft. to 5 ft. 6 in. apart. Scaffold cords are made of hemp or steel wire, about 20 ft. in length. It is essential that they should be in good condition, as it is upon the proper tying and strength of these cords that the security of the scaffold depends.

The standards are planted, as a rule, about 4 to 5 ft. from the building, with the ledgers firmly attached to them. A support is formed to receive the putlogs, one end of these resting on the ledger and the other bearing on the wall of the structure, for which purpose, on a new building, holes are left to receive them. The putlogs are lashed to the ledgers and securely wedged into the wall.

Putlogs are made from birch, 5 to 6 ft. in length and 3 to 4 in. square on section. They are spaced 4 to 5 ft. apart on the ledgers and form a base on to which the scaffold boards are placed. These latter are usually 12 ft. long, 9 in. wide and 1½ in. thick, and are often bound at the ends with hoop iron to make them durable. In erecting a scaffold, and particularly in laying the boards, great care must be taken. Traps must be avoided, that is, the overlapping of the boards on the putlogs, otherwise a serious accident might occur. The boards are butted, but where the joints occur, two putlogs should be placed about 3 in. apart, in order to give ample

bearing for the boards at the ends. If the scaffold adjoins a roadway, it is desirable to have guard boards at the sides to prevent any materials from falling on to persons below. A safety rail can be provided as an additional safeguard to the workers. A scaffolding may require bracing to give additional stability. Braces are formed with similar poles to those used for standards; they are lashed diagonally across the framework to the standards and ledgers.

Tubular scaffolding, now often used, consists of lengths of steel tubes, up to 9 ft. long connected by steel couplings secured with nuts and bolts. Uprights for the ground foundations are fitted with steel base plates. Tubular scaffolding is easier and quicker to erect and to dismantle than timber scaffolds, and if properly erected is safer. A number of firms hire out tubular scaffolding, and erect and dismantle it on the site, even for quite small jobs.

Within the area of some local authorities scaffoldings have to be approved by an officer of that authority before they may be used; this applies particularly to the London district, where there are by-laws affecting the erection of any scaffolding for building purposes. An experienced workman should be employed to raise all but the simplest types.

SCAGLIO'LA. Scaglio'la is a composition of coloured materials to imitate marble, and is sometimes known as *moschia*. It is composed of gypsum, or sulphate of lime, calcined to evolve the surplus moisture and to reduce it to a fine powder.

When it is required for use, sufficient water is added to the mixture to form a paste, and this causes the diffusion of the colours required. It is laid on to brick walls in the form of a plaster.

SCALD: How to Treat. A burn produced by a hot liquid or vapour is spoken of as a scald.

The top of the foot is a common site for a scald, and when this happens the greatest care must be taken in exposing the injury. If the boot is on it may be better to cut the lace than loosen it in the usual way, and a sock or stocking should always be cut off. It will further help in the removal of a stocking if the foot is placed in warm water. As in burns from other causes, the first symptom to be treated is the shock-like condition. Warmth and stimulants are necessary.

In dressing the burn, if the skin is broken, greasy applications should not be used, as they interfere with the cleansing of the wound by the doctor. Cloths wrung out of warm boracic lotion are the best immediate application and they should be kept continuously moist with the lotion. See Burn.

SCALE: The Insect. An insect known as scale affects many shrubs and flowers, both indoors and out. The males are small black flies, and the females have the appearance of small scales, or plates, which affix themselves to the leaves or bark of plants in small brown or grey spots. Apples and pears, stone fruit, roses and palms are those which are chiefly affected.

One remedy is to spray with paraffin emulsion; while, in the case of stem infection, methylated spirit brushed into the bark is effective. Paraffin emulsion is made by dissolving a handful of soft soap in hot water, adding an eggcupful of paraffin and two gallons of water.

SCALES: For Weighing. A pair of scales is a necessary adjunct to every household. In addition to those used in the kitchen for weighing food, scales are useful on the writing-table. For this purpose small pairs are made of brass and other metals, or of wood with brass fittings, with weights suited to the

weighing of letters and small parcels. Scales are also used by photographers.

Kitchen scales are of two main types. One requires certain weights and works by means of a balance, the articles weighed being put into a shallow pan on one side and the weights on the other. An ordinary pair will weigh anything up to 7 lb., but larger ones can be bought. The other type works by means of a spring, weights being unnecessary. The articles to be weighed are placed in a pan at the top, and their pressure moves a pointer on a dial to mark the correct weight. Modern examples are made of porcelain and are washable and hygienic. They usually weigh up to 14 lb.

SCALLOP: How to Prepare. Small portions of meat or fish cooked in a savoury manner in scallop shells or dishes of that shape are called scallops. The name is that of a shellfish, and the shell itself is so hard that it is not injured by being placed in a hot oven. When the fish has been disposed of, these shells are often kept for cooking fish.

Scallops are usually obtained from the fishmonger ready for cooking, but if they must be prepared at home open them with an oyster knife in the same way that an oyster shell is opened, then trim away the beard, and black parts and wash them well in two or three waters. They are somewhat indigestible and it is essential that they be well cooked. The name is sometimes found spelt *escalop* on menus.

To cook scallops, parboil the fish in their own liquor for 5 min., then drain and keep them hot in their shells. Put the liquor into a small stewpan with 1 tablespoonful creamy white sauce for each fish. Add a little extra seasoning and a squeeze of lemon juice, then make all hot over the fire. Pour over each scallop in its shell a spoonful of sauce, then coat with fried breadcrumbs. The shells should be well washed.

Scallops may also be stewed. After preparing the fish, well wash them, then put them into a stewpan, cover them with warm water, and simmer for from 15 to 20 min. Dish them in a china baking-dish covered with white sauce, which should be made partly with the liquor in which the fish have been stewed.

To fry scallops, prepare, wash, drain, and blanch them, then dip each in a rich light batter and fry in deep fat. Pile them up on a dish paper and garnish with fried parsley. Serve with them shrimp or oyster sauce. Add to the batter a little butter and season the scallops well.

SCALLOPING: How to Work. This is used to form a fancy edge on babies' clothes, underwear, frocks and house-linen. It is worked on white flannel with floss silk, on silk and cotton wear with embroidery cotton or silk, on linen with linen embroidery thread.

In the case of flannel, long-cloth and nam-sook it can be worked on the single material, but when working on thin silk or crêpe-de-Chine it is advisable to sew a narrow strip of tissue paper or fine book muslin under the edge of the material on which the scalloping will be worked. This prevents puckering, and gives a firm, even edge.

The design is put on the material by means of a transfer which is ironed off in the usual way. These transfers are sold by the yard in various shapes. The ordinary scallop pattern is in a semicircle; there are fancy vandykes made up of 3 or 4 semicircles on each side of it. The design illustrated is a wide one, each scallop measuring 2½ in. It is not necessary to buy a scallop transfer, as a coin and a soft lead pencil will provide various designs. For the average scallop, which is about 1 in. wide when worked, a halfpenny will act as the tracing medium.

To mark the design draw a line across the diameter of the coin, so that the exact half

can be used. Pin the material taut on a drawing board, so that the cut edge is away from the worker, then place the coin on the material about 1 in. from the edge and draw



Scalloping. The design is padded and then worked in buttonhole stitch the material being subsequently cut away from the outer edge

round the coin from one point of the centre line to the other when a half circle will result on the material which forms the outside line of the scallop. To make the inside line, draw the coin inward until there is a space of $\frac{1}{8}$ in. from the pencil line to the edge of the coin, at the centre of the scallop. Again draw round half the coin, but beginning this time on a level with the points of the first semicircle drawn instead of in a line with the centre of the coin.

For successive scallops the coin must be placed against the previous one, taking care that the guiding line is quite straight. As a further guide the starting-point for the first semicircle could be marked on the coin. By the same method a permanent scallop rule can be cut out in stiff cardboard making about ten scallops, and this can be moved along for any length of material. Tiny scallops for babies' clothes can be made with a sixpence, and the larger ones with a halfpenny and a penny, marking the shape on the cardboard.

Sometimes the work is padded as shown at the right side of the illustration. The buttonhole work is done from left to right, holding the material with the cut edge towards the palm of the hand. After joining the thread on the wrong side, bring it through to the right side on the lower line. Then holding the thread down in a loop under the left thumb, put the needle down through the material on the top line, and bring it up again on the lower line, next to the spot where it came up before, as the work must be close and even. Draw the needle through, still keeping the loop down under the left thumb, and only release it as the last bit of thread is drawn through. This will make the pearl edge and after the whole work is completed the material is cut away under this pearl edge.

For the latter purpose a very sharp pair of embroidery scissors must be employed, so that the material can be cut clean away without cutting the embroidery stitches. See Embroidery. Night Wear Case. Transfer.

SCALY LEG. This disease of poultry is due to a tiny mite. The scales of the legs and feet become raised and separated, and a chalk-like excretion accumulates between and over them. The disease is slightly contagious. Infected birds are lame, have a difficulty in perching, and get out of condition.

To cure the disease the isolation of the diseased birds is essential. The legs should be bathed in hot water in order to soften the crusts. These are then removed and a mixture of one part of creosote to 20 parts of lard is applied. The limbs, some days after treatment, should be well cleaned with hot water and soft soap. See Poultry.

SCANTLING. The is a term used in building and carpentry work for the dimensions of a piece of timber, i.e. its length, breadth, and thickness. The name is often applied to an actual piece of timber, which differs from other timber in not according with some series of standard sizes, in the same way as battens and planks. See Batten; Board; Plank.

SCAR. The tissue which takes the place of normal tissue in a healed breach of tissue from disease or a wound is called a scar or cicatrix. At first a scar is red and soft, but

becomes gradually harder and whiter. It never contains hairs and sweat glands, like ordinary skin. When large as after an extensive burn, in contracting it produces puckering of the skin which may interfere seriously with movement. Scars, if irritated, rather readily develop cancerous growth.

SCARAB. Egyptian gems that are moulded or cut in the form of the sacred scarabaeus, or beetle, were originally used as amulets, and afterwards for personal ornament. They were made in all available materials, including green basalt, lapis lazuli, serpentine, emerald, cornelian, jasper, amethyst and onyx, besides wood, ivory and gold. The most numerous were in pottery or faience covered with a bluish-green glaze.

On the flat, oval base scarabs were usually incised with the names or representations of divine, royal and official personages, or with good luck mottoes and magical devices. Scarabs were also used as seals, being either strung round the neck or mounted in metal signet rings. Many imitations of old scarabs are made and used in modern fancy jewelry when fashion dictates. See Ring.

SCARBOROUGH LILY. The common name of *Vallota purpurea*, a half hardy bulb suitable for cultivation in pots in greenhouse or room window. It bears showy lily-like scarlet flowers in August. The leaves are evergreen. During winter the soil must not be watered until moderately dry but in summer it must be kept moist.

The bulbs should be potted in early summer one in each 5-in. flower pot, in a compost of loam two-thirds, and leaf-mould one-third, with a scattering of sand. The Scarborough Lily flowers most freely when the pots are full of roots: repotting should be done only when absolutely necessary. In spring some of the old surface soil should be removed and



Scarborough Lily. Scarlet flowers of an evergreen plant for the greenhouse or room window

replaced with fresh compost. This plant, when well rooted, benefits by occasional applications of guano or liquid manure.

SCARECROW. Originally this was a dead crow strung up to a stake to scare other birds from the crops. Now the word is generally given to many types of bird scarer, including the familiar old man of the fields, made of a rough wooden cross upon which hangs an old coat topped with an ancient hat.

Modern scarecrows, which are known usually as bird scarers, are more effective than these examples that quickly lose their terror in the eyes of feathered raiders. They include laths strung with bunches of tin, or pieces of glass attached to swaying hoops, and so slung that when the wind blows the tin or glass tinkles, alarming the birds and causing them to fly away. Whatever type is adopted, the scarecrow must repeatedly be altered, because familiarity with the same pattern breeds contempt and ceases to puzzle the raiders. See Bird Scarer; Netting.

SCARF. The primary use of a scarf is to protect the throat and shoulders from cold, but frequently it is worn by women merely for its decorative qualities.

A silk scarf $1\frac{1}{2}$ yd. long and 1 ft. wide can be quickly crocheted in three shades of one colour. Two hanks of crochet silk are required of the palest shades, one of the medium and one of the darkest: also a No. 11 crochet hook. Make 82 chain and work 5 in. in the darkest shade. Break off, join medium shade and work another 5 in. Break off and join palest shade. Work this 34 in. and then finish off with 5 in. of the medium and 5 in. of darkest shade.

Knitted Scarves. Scarves are simple to knit. Any number of stitches may be cast on the needle, according to the width required, and plain or plain and purl knitting or some other pattern, used. The knitting should be continued until the scarf is of the necessary length, then the stitches should be cast off and fringe added to the two ends. To obtain an even edge, slip the first stitch of each line.

A fringed scarf can be made in Shetland floss; 4 oz. floss, a pair of No. 7 needles, and a medium size bone crochet hook are needed to make it. The scarf measures 48 in. long and $11\frac{1}{2}$ in. wide, and the knitting is worked at a tension that will produce about 18 stitches to 3 in. in width, and 30 rows to 3 in. in depth.

Commence by casting on 60 stitches, and for the first row * knit 12 wool forward knit 2 together 6 times, and repeat from * to the end of the row, finishing with knit 12. Repeat this row 11 times, making 12 rows in all. The 13th row consists of * wool forward, knit 2 together 6 times; knit 12, repeat from * to the end of the row, finishing with wool forward, knit 2 together 6 times. Repeat this row 11 times, making 12 rows in all.

Then repeat from the first row until the work measures 48 in., and cast off. For the fringe, take 6 lengths of the wool, each about 10 in. long, and with the crochet hook pull through the first stitch at one end of the scarf, and knot.

Repeat this all along the row in about every third stitch of the knitting, and then fringe the other end to correspond.

A scarf made from brushed wool might be composed of two different colours arranged in bands. For a scarf 2 yards long and 20 in. wide, 9 oz. of rose-coloured wool and 3 oz. of white wool are needed; but if thicker wool is used, these quantities must be increased accordingly. The white wool is used for the bands and part of the fringe, and the whole is done in plain knitting. Work at a tension of 5 stitches to the inch in width.

Begin by casting on 100 stitches, and knit 54 rows or 6 in. with the rose-coloured wool;

then 18 rows or 2 in. with the white, twisting the rose wool over the white before knitting the first stitch, so as to bring it in line. Work another 2 in. with the rose wool, and then make another band of white. This also should be 2 in. wide. Knit $1\frac{1}{2}$ yd. with the rose wool, allowing for a second set of white stripes, and making the latter correspond with those at the other end. The scarf will then be complete.

For the fringe, wind the wools over a card or thin book measuring 5 in. across, and cut them through at one end. Take two strands together, double them, and with a bone-crochet hook draw the loop of the threads through one of the casting-on or casting-off stitches. This will depend upon to which end of the scarf the fringe is first applied. Pass the ends of the cut wools through the loop and draw them up closely. Repeat this all along both ends of the scarf, clipping the bottom of the fringe to make it even. Lastly, brush the scarf on one or both sides with the special wire brush that can be bought for the purpose.

Any other colours may be chosen instead of rose and white, and the scarf can be made a narrower width by casting on 60 instead of 100 stitches. See Crochet: Knitting.

SCARFED JOINT. In carpentry various kinds of scarfed joints are used when it is necessary to join the ends of timbers to increase their length. An ordinary scarfed joint is made by cutting the two ends of the timber to a long angle, and gluing, dowselling, bolting, or otherwise securing the two parts together. It is essential to have both angles alike and both faces square to each other.

In the case of a lapped scarfed joint, instead of making the joint at an angle, half of each end is cut away so that each piece of material can lap on to the other, as shown in Fig. 1. This is a useful all-round joint, easy to make, and is practically an ordinary lapped halving joint. When used in timber the joint should be square, and secured with nuts and bolts. Such a joint would not be suitable for an upright post which has to support a moving load. For the best proportions the length should be twice the breadth of the pieces that are to be joined.

The splayed scarfing joint used for lengthening tie beams is shown in Fig. 2. Proper proportions for the length of the joint are about $3\frac{1}{2}$ times the greatest breadth. The tabled scarfing in Fig. 3 has the advantage that it naturally resists tension as well as compression strains, and shrinkage of the timber does not seriously affect its security; but it requires careful fitting. The sides of the timber have to be very carefully marked out and the lines accurately worked to them, all the joint faces being kept perfectly square and true. See Joint.

SCARLET FEVER. A common infectious disease, scarlet fever, or scarlatina, owes its name to the vividness of its rash. The specific cause seems to be a variety of streptococcus which generally enters the body through the

nose and throat; moreover, the infection is most often communicated by the secretions from those parts.

The incubation period is usually about three or four days. Then the patient becomes fevered and suffers from sore throat and probably vomiting, especially if it is a child. On the second day the rash appears, first on the neck and chest but in the course of a day or two usually covering the whole body, with the exception of the skin around the mouth. The rash consists of tiny red spots, each being surrounded by an areola of pink. The mouth and throat have also a scarlet colour.

The tongue is furred at the beginning of the fever and may have the appearance described as the white strawberry tongue. In this the surface is covered with white fur but is dotted over with red spots due to swollen papillae projecting through the fur. Later on the fur is thrown off, leaving a clean red surface, but the redness of the papillae is of a different shade and they are still conspicuous; this is called the red strawberry tongue.

With the appearance of the rash the temperature rises further, reaching 102° to 103° F. or more. The rash lasts for three or four days and then fades; the temperature also gradually declining. About seven days after the appearance of the rash peeling begins, and this usually goes on for two or three weeks at least.

Several very important complications may occur in scarlet fever. There may be inflammation of the kidneys. The urine becomes scanty and contains albumin and often blood, while there is swelling of the feet, ankles and face, or even more generally. Another complication is inflammation of the middle ear. Infection passes up the Eustachian tubes from the nose and throat and commonly causes a suppurative discharge from the ear. Possibly the infection may pass backwards and cause mastoid disease. A third complication is acute rheumatism.

The general treatment of scarlet fever is that of an infectious disease (q.v.) and of the state of fever (q.v.). The mouth and throat should be kept very clean by the use of

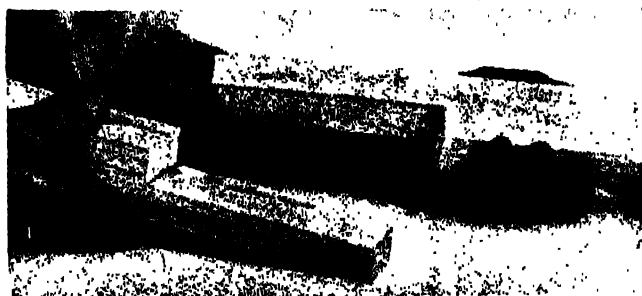
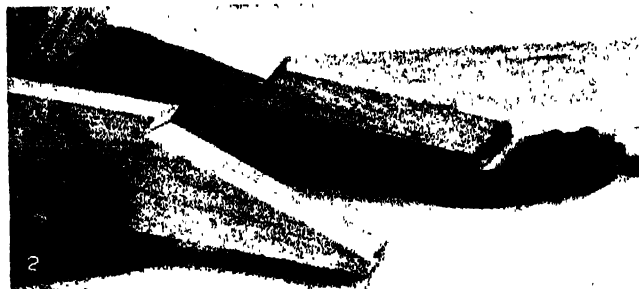
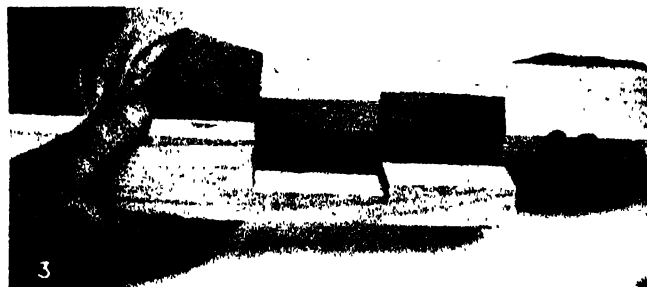
SCARLET RUNNER. This favourite climbing bean yields very profitable crops if well grown. It needs deeply dug and manured soil to ensure that the plants do not suffer from lack of moisture in dry weather. It is not a success on poor land. Seeds should be sown during the second week in May at about 9 in. apart in a double row, the lines of the row 18 in. apart; it is wise first to put in tall sticks at 9 in. from each other on both sides of the prepared soil and to set one seed near each stick. A few seeds should be sown in a box of soil to provide seedlings which may be needed in case some of the seeds sown in the open fail to germinate. Another plan is to sow all the seeds in boxes of soil in a frame in April and to plant the seedlings in May. Stout sticks 7 or 8 ft. high are needed to support the beans adequately.

Although the finest crops are obtained from plants in the open garden, runner beans do fairly well in partial shade and may be sown to cover a fence or trellis in suburban gardens.

The dwarfing system is adopted by many market and some private gardeners. In this the rows are drawn about a yard apart, and the twines pinched out regularly as soon as the plants have got well into bloom. Such a row makes a good border in a cottage or suburban garden. Under this mode of culture it is a good plan to sow a double row, the lines a foot apart, and to set the seeds in angles with each other at 9 in. apart. A pint of average runners contains about 180 beans.

The modern varieties bear large clusters of big, fleshy pods. Some of the best are Prize-winner, Best of All, and Scarlet Emperor. The old variety, Painted Lady, has pink and white flowers.

Surplus beans should be stripped from the haulm at the first sign of frost. They may be



Scarfed Joint: three varieties. Fig. 1. Lapped joint. Fig. 2. Splayed scarfed joint. Fig. 3. Tabled scarfed joint, a type that resists both tension and compression strains.

an antiseptic mouth-wash (q.v.) several times daily, and it will often be necessary to use a nasal douche as well.

By inoculation with a vaccine a skin reaction is obtained in persons susceptible to scarlet fever, and these can then be given a prophylactic serum or vaccine. Sera are also used in treatment. See Quarantine; Rash.

beans. See Beans, French Beans.

SCENT: The Various Kinds. The scent sold in shops consists of simple flower extracts, of blended bouquets, and of synthetic perfumes. Each season new perfumes of the first type appear from the great perfumery houses, where subtle ingredients are mixed to obtain something a little different from the scents already on the market, something exclusive, which cannot be successfully imitated. The artistry which evolves a new, fashionable bouquet commands a high price; apart from this, the cost of materials and production renders it impossible for any good scent to be cheap. To the make-up of these expensive scents go one or more of the natural perfumes

stored in any glazed vessel, such as one of the old-fashioned red breadpans, if placed layer for layer between rock-salt. It is quite possible to have perfectly fresh beans at Christmas time by employing this method. Scarlet runner beans are cooked in the same way as French

dissolved in alcohol. Some of these natural perfumes are valuable in themselves, most are costly to extract. They include the essential oils of attars of flowers, the animal scents; ambergris from the sperm of whales, musk from glands to the musk deer, musk ox, and musk rat, civet from the civet cat, balsams such as sandal and opopanax from the wood of trees and shrubs, oils like bergamot from the skin of citron fruits, oils from leaves such as verbena and geranium; from roots such as orris, and from the vanilla and tonka beans, the last developing the principle for the perfume known as New Mown Hay.

To obtain the essential oils from flowers in their absolute purity three processes are used. The first of these is distillation, in which the flowers, roses for instance, are heaped into boilers, through which steam passes, and gradually the essence oozes into a glass tube at the base of the still, to be collected in precious drops. The second process is effleurage, in which cold, purified grease is spread on glass trays and the flowers, jonquil, tuberose, or jasmine, are sprinkled over the surface to yield their scent to the grease, and the next day are removed, when fresh blossoms take their place until the grease is thoroughly impregnated.

Maceration is the third process. Some grease is placed in a vessel and melted by a water bath at as low a temperature as possible. Into the liquid grease the flowers—the process is chiefly used for violets—are stirred, left unmixed for a day, and strained off, fresh flowers being added until the liquid can absorb no more of the perfume.

In these last two processes the scent is extracted from the grease by alcohol being stirred into it for hours and then left quiet, when the fat separates, relinquishing the perfume to the alcohol, which is drawn off, evaporated, and condensed until only the pure essential oil remains. Orris root is used to mature the essential oil of violet, and oil of geranium that of the rose. Even in the choicest Turkish attar of roses the petals are often sprinkled with geranium oil before being placed in the still.

Some of the cheap scents depend largely for their composition on chemical combinations imitating the natural perfumes. Their chief defect is that often their imitative values do not last, and this accounts for the unpleasant odour of much cheap perfume when stale, the chemicals used having been affected by exposure. Some of the cheaper flower perfumes are quite pleasant in use, but their cheapness is due either to extreme dilution of the natural scent, in which case they have no lasting quality, or to a less expensive natural oil being substituted for that of the name of the flower on the bottle.

Scent should be regarded as a luxury of refinement and worthy of a good price. The best qualities are economical in use, as a few drops suffice to give the delicate fragrance. See *Eau de Cologne*; *Lavender Water*; *Put Pourri*; *Sabon*, etc.

SCHIPPERKE. The little skipper, to give an English rendering of its Flemish name, is an affectionate and lively small dog with an acquiring mind, a vigilant watch-dog, keen ratter, and intelligent companion.

Wholly black in colour, he has a sharp fox-like appearance, with a short straight back, well rounded at the hindquarters, and a dense, harsh coat which is developed into a bristling frill around the neck. The legs are straight and small boned, the feet small and cat-like. There is a tail; that is to say, some are born without one, the others have it docked in infancy. The small eyes are brown and bright; the ears small, sharp pointed, and carried stiffly erect. The weight should be about twelve pounds. See *Dog*; *Kennel*. Pron. ship-per-ke.

Schizanthus. The botanical name of the beautiful half hardy annual called the butterfly flower (p. 11).

Schnapps. Hollands gin is also frequently known as Schnapps. See *Gin*.

SCHNAUZER. This is a German variety of terrier. It is a rough coated animal, stoutly built, docked and weighing about 24 lb. In colour, it is grizzle or greyish. It is very active, sagacious, game, and companionable.

SCHOOL. In Great Britain the grades of school available in fairly large towns number four: (1) the nursery school, catering for children under school age, i.e. below 5 years; (2) the infants' school, accepting children of from 5 to 8 years; (3) the junior school, where the pupils are aged from 8 to 11 or 12 years; (4) the secondary school, with students of from 11½ to 15 (the minimum school leaving age) and upwards to 18 years. (The term primary school includes both infants' and junior schools.)

In each of these classes, except possibly the first, parents have a choice between the "free" schools, maintained by the state through the local education authority, and the "fee-paying" or "private" schools, either maintained wholly by private enterprise or in receipt of a "direct grant" from the state. The last-named (the direct-grant schools) have to keep a certain number of places open for students nominated by local education authorities.

In rural areas there is often little choice beyond the "free" village school at the infants and junior stages, except to send a child to the nearest town or to a boarding school.

Nursery Schools. The majority of these are maintained by local authorities, and limited to children whose parents are both at work all day. There are very few "private" schools for children below 5 years. At the nursery schools, babies are fed and looked after, put to sleep at appropriate times, and helped to play with simple toys and games. A fee is charged which varies from district to district.

Infants' Schools. Education in Great Britain is compulsory from 5 to 15 years. Shortage of accommodation, and the difficulty of recruiting infants' teachers, have caused the "free" infants' schools to become overcrowded, and parents have to consider whether a "private" school, with smaller classes, will offer a better beginning to education for their children. A parent must assume that if a 5-year-old is to become a "fee-paying" pupil it is almost certain that he will have or remain one until at least the age of 12 years, and possibly until he leaves school at 15 or 18 years. The "free" schools cannot

legally refuse a pupil; and if a parent's circumstances change, a child may be removed from a private and placed in a state school; but such a violent change of educational atmosphere should be avoided if possible.

Junior Schools. Included in this category are the preparatory schools, which prepare children for entrance to the "public" schools. Some day schools of public school rank have their own junior departments, with others, certain preparatory schools are closely associated.

The vast majority of parents will send their children to the local "free" junior school. At all types of junior school, education consists in preparation for entrance to a secondary school of some kind. For this, three or four years (from 8 to 11 or 11½ years) are considered sufficient in the state schools, rather longer (up to 13 years) at the preparatory schools. At the age of 11 or 11½ years, every "free" school pupil (and any other of the age who wishes to do so) sits for a selective examination, called "common entrance" by some authorities and popularly known as the "scholarship," on the result of which, together with the head teacher's report, the pupil is directed into one of the three types of secondary school.

Secondary Schools. The state or "free" system of education provides three types of secondary school, one of which the children must attend from 11½ to 15 years and possibly longer. These are known as (1) the secondary grammar school, providing an academic education which prepares for the professions, for clerical occupations or managerial posts, and for university entrance, and the syllabus of which leads to the General Certificate of Education, the equivalent since 1951 of the former "matriculation" and "higher certificate" examinations; (2) the secondary technical school, giving a general education with a vocational bias towards such crafts as carpentry, metal work, building, dressmaking, hatter's work, commercial art, etc.; and (3) the secondary modern school, providing a modern education in general subjects but not normally in preparation for a profession or a craft, except for some commercial training. Some authorities combine the three types into one large school known as a "multilateral" or "comprehensive" school.

Shortly before the selective examination taken at 11½ years, the parent receives a list of the secondary grammar schools available to his child; this will include those direct-grant schools which maintain a few free places, and those secondary grammar schools maintained by the local education authority in which all places are free, together with special religious establishments, convents, and the like. If a parent wishes his child to have a secondary grammar school education, he indicates upon the form the school which he would like the child to attend if he passes the selective examination; sometimes three choices are offered, and the parent indicates his first, second, and third choice. About three months later a letter from the local education authority informs the parent whether or not his child has been deemed suitable for a secondary grammar school education and, if so, for which of the three schools named he has been accepted. If a child is not offered a place in any secondary grammar school, then, failing the parent's decision to send him to a "fee-paying" secondary school, he passes automatically to the secondary modern school, where later he may sit for another selective examination to qualify for a secondary technical school. Thus it is at the age of 11½ years that the child's whole future life, career, and happiness may be decided, and the parent must decide to which type of secondary education the child is best suited.



Schipperke. Champion of a breed of small alert dog which makes a trustworthy guard.

The "fee-paying" secondary schools consist mainly of the "public" boarding schools of high reputation and high fees; the "public" day-schools, also expensive in fees, fares, and meals and, in any case, possibly unable to accept pupils who have not passed through their own junior departments; a few commercial "colleges," which prepare mainly for secretarial and business careers, but whose pupils are prepared for the General Certificate of Education; and the private enterprise day or boarding-school of varying merit.

Secondary education for the majority ends at 15 years. For those preparing for university entrance or for a profession, it should normally continue until 18 years, the last two years being spent in preparing for the Advanced or Scholarship Level of the General Certificate of Education.

Special Schools. Handicapped children, including the mentally and physically defective, the deaf, and the blind, must by law be given an education suitable to their abilities by the local education authority. Special schools, and transport, are provided, and, through voluntary organizations like the National Institute for the Blind, and the National Institute for the Deaf, education up to secondary grammar school and even university level can be obtained. Advice should be got from the local Director of Education, and from the organizations mentioned. Mentally defective children classed, after examination, as ineducable are in the care of the Ministry of Health, which provides training schools, and information on these is obtainable from the local Medical Officer of Health.

SCHOTTISCHE. In the ordinary schottische, the first, second, and third movements are the same as in the polka, the woman beginning with the right foot, her partner with the left. The fourth movement is a slight spring on the toe of the commencing foot, and then, as in the polka, the step is made, beginning with the other foot.

Having performed the full step from side to side, the half step is made by a little spring on the toe of the first foot: left, man, right, his partner. The other foot is passed behind, rested on the toe, and a spring is made on the first foot again. Then the movement is repeated with the other foot. The half step is used for turning.

In the Highland schottische the couple face each other, hop twice on the right foot, give a beat in the fifth position in front and one behind with the left foot. Then each passes to the left with the first 4 movements of the ordinary schottische, and repeats the whole step to the right. They then join arms, turn round with 8 hops, and repeat. *See Reel.*

SCIATICA. Neuralgic pain in the great sciatic nerve running down the back of the thigh is known as sciatica. It is more common in men than in women, chiefly amongst those who are constantly exposed to the weather.

Throughout the course of an acute attack the patient is best in bed. At the start, poultices along the course of the nerve often relieve the pain. At the same time they ensure the limb being kept at rest. After a day or two the poultices may be discontinued, large pads of dry cotton wool being wrapped about the limb in their place.

At the onset of the attack some aperient, such as 2 or 3 gr. of cascara, to be followed next morning by a teaspoonful of Epsom salt, is usually advisable. To control the pain, aspirin in 7 to 10 gr. doses every 4 hours may be taken under medical advice.

Stimulating applications, such as liniments of belladonna, aconite, or chloroform, the galvanic electric current, hot water douches, or alternating douches of hot and cold water,

may be tried. *See Gout; Poultrice; Rheumatism. Pron. sci-ät'-ica*

SCILLA. This group of spring and early summer flowering bulbs is popularly known as squills. The bulbs are planted in early autumn in ordinary soil, and they flourish in



Scilla. Three of these blue spring flowering bulbs grown in a pot for house decoration.
Courtesy of American Gardening

sunny or partially shaded places, bluebells are happy in deep shade. The bulbs of the small early kinds should be set 2 in. deep, the larger ones 3 in. deep. The best of the low growing early spring squills are *albica* and *bidola* with blue flowers; they look well in the rock garden, flower border, shrubbery, and on the lawn.

The common bluebell, or wild hyacinth, is *Scilla nutans*, of which there are varieties with rose pink, pale blue, dark blue, and white flowers. One named *Scilla autumnalis*, 6 in., has purplish blue flowers in early autumn. The Spanish blue bell (*hispanica*) 15 in., bears showy spikes of bloom in various colours in May. The Italian squill (*italica*) and the Peruvian squill (*peruviana*), 6 in., have pale blue flowers in early summer and are suitable for the rock garden. *Scillas* may be set in pots in early autumn and grown in an unheated or slightly heated greenhouse to provide bloom in early spring. They are suitable also for planting in bowls of fibre in the home. *See Bulb; Hyacinth. Pron. sil'a.*

SCISSORS. In a pair of scissors, the flats of the blades slide over each other so that a shearing action is obtained, the blades are ground to a wide angle, not a fine angle as for a knife. Scissor blades should be bent slightly so that their natural spring makes the cutting edges scrape each other as the scissors are closed, and the pivot should be a screw locked by riveting the point over. Many household scissors lack these features, and the scraping action has to be got by a twisting action of the thumb and finger. It is thus difficult to use a pair of right hand scissors with the left hand. To test the shearing action of scissors when buying them, the rings should be held one in each hand and the scissors opened and shut; under the test the blades should not flap freely, but a steady grind should be felt, though a pair that is stiff to work should, of course, be rejected.

Repairs. If scissors get loose after long service, the pivot should be tightened a little by laying the scissors on a heavy piece of iron, with the head of the screw down, and drawing the rivet tighter by light hammer-blows on the screw point, the screw having been first tightened with a screwdriver.

When scissors get blunt, the edges should be ground with an oilstone or on a grindstone, cutting at right angles to the plane of the flat of the blade, the scissors being held wide open for the purpose. On no account should

any attempt be made to grind the flats of the blades. *See Cutting out; Grindstone; Pruning; Scavenger; Shears.*

SCONE: How to Bake. Scones can be cooked in the oven or on a griddle. The mixture for the scones is usually of a plain character, and the raising agent consists of bicarbonate of soda and cream of tartar or baking powder.

If a little extra time and trouble is taken by sifting the carbonate of soda and cream of tartar with the flour two or three times, the scone will be greatly improved. Butter-milk, or sour milk, is considered to be superior to fresh milk for moistening the dough, in which case a smaller proportion of cream of tartar is required for mixing with the carbonate of soda. Tea scones can be made by sifting 1 lb. fine flour with $\frac{1}{2}$ oz. carbonate of soda, $\frac{1}{2}$ oz. cream of tartar and a good pinch of salt into a basin. Work together 4 oz. butter or margarine, and $2\frac{1}{2}$ oz. castor sugar, adding, when properly creamed, 2 well-beaten eggs and $\frac{1}{2}$ gill milk. Mix up the flour into a stiff dough with the liquid, roll it out about $\frac{1}{4}$ in. thick and cut it into small round pieces.

Cut out as many as possible, then fold up the dough, roll it out again and cut another batch proceeding in this manner until all the mixture is used up. The shaping should be done expeditiously, and as each round is cut out it should be turned over and placed on the baking sheet. No fruit is added to the scones, and they should be served hot, split and thickly buttered. Brown scones can be made by using half wholemeal flour and half white flour. A little more milk may be necessary to get the right consistency. For sultana scones, add 2 oz. cleaned sultanas.

Excellent baking powder scones can be made by measuring the quantity of milk for tea scones by 1 gill, and adding to the flour 2 heaped teaspoonsful of baking powder in place of the carbonate of soda and cream of tartar. These scones should be shaped with a tablespoon dipped in flour, as they are too moist to handle easily. They should be baked in a very hot oven, and taken hot from the oven. *See Griddle Cake.*

SCORCHING. For scorch marks on linen, mix together $\frac{1}{2}$ pint vinegar, 2 oz. tulle scorch, $\frac{1}{2}$ oz. shredded white soap, and the juice of 2 onions, and boil them up until they form a thin paste. Spread this over the marks, allow it to dry on the material, and then wash it out. The process can be repeated if necessary. The onion juice is obtained by peeling and slicing the onions and then pounding or squeezing them. Silk or wool that has been badly scorched will rarely yield to treatment. *See Ironing.*

SCOTCH BROTH: How to Make. The basis of Scotch broth is mutton, and it is flavoured with vegetables and thickened with pearl barley. To make it, take 3 lb. middle and scrag end of a neck of mutton, joint it, and cut all into neat pieces. Put these into a large saucepan with 3 quarts cold water and $\frac{1}{2}$ oz. salt, and boil up, skimming off all impurities.

Now prepare and cut in large pieces 2 good-sized turnips, 2 leeks, 2 onions, and 1 head of celery; add these with a large bouquet garni to the mutton, boil up again and then simmer gently for four hours. Strain through a sieve into a basin, rinse out the saucepan, and return the liquor to it, adding $\frac{3}{4}$ oz. pearl barley which has been washed and parboiled.

When the broth boils up again, add to it a mixture of fresh vegetables cut into dice. These should consist of 2 small carrots, 2 large turnips, 1 small head celery, with 2 onions and 2 leeks shredded finely. Season with salt and pepper, and boil gently for 1 hour, skimming the broth free from fat. Sometimes carrots are omitted. Whether the portions of mutton are served in the broth is a matter of taste.

SCOTCH BUN. This bun requires two days for making. To prepare the dough, sieve together 1 lb. flour and 3 oz. sugar. Then rub in a little less than ½ lb. butter or margarine. When the mixture is quite smooth, cream together ½ oz. yeast and a pinch of salt; pour in ½ pint cold milk, and strain the whole into the flour, etc. Well knead the mixture, then leave it overnight in a warm room, covering the bowl with a thick cloth.

The centre of the bun must be prepared the following day with ½ lb. of the above mixture ½ oz. spice ½ teaspoonful treacle, a well-beaten egg ½ lb. mixed raisins, currants, and sultanas a few sweet almonds, and ½ lb. shredded candied peel. Mix all these ingredients in a basin, afterwards kneading well and moulding the mixture with a little flour.

To make the cover of the bun, take the rest of the dough, rolling ⅓ of it into a round, and fit the inside part of the bun into this. Then draw up the dough at the sides to reach the top, brushing beaten egg over the edges, and roll out the remaining dough for the top portion. Put on the top round as neatly as possible, and prick the bun all over with a fork, making deep holes all over the surface. Brush the bun over with a little milk and bake in a moderate oven till brown. This should make a 3 lb. bun.

Scotch Fir. The common name of *Pinus sylvestris*, a conifer which is invaluable for planting in exposed places. See Pine.

SCOTCH KALE. This is a very hardy variety of borecole or kale and includes dwarf and tall curled kinds. No type of winter green excels it for free yielding crops during autumn, winter, and spring.

The kale reaches a height of from 2 ft. to 3 ft., with heads of deeply curled leaves, which are at their best after exposure to frost. Seeds are sown on a reserve border in April and the seedlings are planted out in summer at 2½ ft. apart. See Kitchen Garden.

Scotch Pancake. This is another name for the tea-cakes known as girdle cakes (q.v.).

Scotch Terrier. See Aberdeen Terrier.

SCOTCH WOODCOCK. The savoury that is called by this name is prepared by mixing ½ teaspoonful flour to a smooth paste with 1 tablespoonful milk, and putting what remains from a gill of the latter into a pan with 1 oz. butter or margarine. When these are hot, stir them on to the flour, mix all together, and boil them up.

Simmer them for a few minutes, keeping them well stirred, draw the pan to the side of the stove, and let its contents cool slightly before stirring in one by one the yolks of 2 eggs. Continue stirring the whole over gentle heat so that the eggs may cook, then add salt and cayenne to taste, and a teaspoonful of chopped parsley. Have ready some small rounds or squares of hot, buttered toast, spread them first with some anchovy paste, and then with the hot mixture. Send them to table at once, garnished with narrow strips of anchovy laid across the egg.

SCRAP BOOK. Brown paper makes an effective book. Sheets cut to the required size and stitched together with strong thread, or fastened at the corner with a piece of ribbon, run through, make an excellent background for all kinds of pictures. Books for hospitals, especially for sick children, can be made out of coloured and glazed calico, pink or blue, with the edges pinked and a piece of silk cord or ribbon threaded through to keep the sheets in place. If the calico will not take paste satisfactorily, a little secotine or fish glue will serve the purpose equally well. The great advantage of such books is their lightness.

For the pictures themselves there is no need to seek far. Coloured advertisements cut out and pasted up neatly without the printed matter, and illustrations from bulb catalogues,

or those distributed by seed merchants are useful. Such pictures should be cut out in silhouette if the best effect is to be obtained. Old Christmas and birthday cards, scraps from crackers, and the covers of magazines all help to provide colour and variety. Flour paste is usually sufficient for this work, though for thick cards something stronger may be needed.

SCRAPER: For Boots. In one sense this word refers to an article used for removing dirt from boots and shoes. Such are usually placed just outside the door of a house. See Boot Scraper.

SCRAPER: The Tool. The scraper is a tool for giving a better finish to an article already machined or worked. The type for woodworking, illustrated, consists of an oblong strip of sheet steel about 6 in. by 3 in. and in



Scraper. Oblong strip of steel being used as a finisher in woodwork.

thickness about ¼ in. This tool is largely employed in cabinet making. The method of using is to hold it in both hands a few degrees out of the perpendicular away from the operator. The two thumbs are placed in the middle of the scraper on the side nearest the user, while the fingers grip the other side. Pressure now applied by the thumbs will give the scraper a bend in the middle and away from the operator. The lower edge is put upon the work and a strong forward motion imparted by the upper arm.

In the majority of cases the scraper is used in the same direction as the grain of the wood; but experience is the only guide in this respect. Very often the wood will come up

woolly after scraping: this can be cured by scraping with the grain but from the opposite direction. It is sometimes useful to approach the scraper to the wood in an oblique direction, thus having a decided tendency to keep the grain in place, but it has the disadvantage of making a slower cut.

The method of sharpening represents a radical departure from the standard practice of tool sharpening. The scraper is set firmly in a vice between two pieces of wood, the top projecting a little. A fine file is then run over the top, and the burr thus created removed with a fine oil stone rubbed on the top and sides. When both edges are sharp a round rod of hard cast steel or similar material is pressed on the edge of the scraper at an angle of about 45° with it. The sharpened edge is thus destroyed and another burr created. This burr is the scraping edge of the tool.

Scrapers are extensively employed in metal fitting. Such a tool can be made from an old file, the teeth of which have been ground away on the grindstone and the edges ground sharp and smooth. Such scrapers are durable and efficient. See Cabinet Making.

SCREED. A projecting strip known as a screed is employed in plastering and rendering as a guide in the preparation of a flat surface. It may be of wood or metal or of the same material as the surfacing of the wall.

Wooden screeds are fixed to the face of the wall or other surface with the aid of rough grounds or thin packing pieces. The face of the screed is levelled, or brought into line with the desired face for the work. Two screeds are set vertically and two horizontally, then all four are adjusted until their faces truly represent the outer surface of the wall covering. Lines are stretched from one screed to another and any additional screeds added wherever they are requisite.

The wall surface is thus divided into a series of cells, the screeds being usually about 2 to 3 ft. apart. When this preliminary work has been done the covering material is then applied, and afterwards levelled with a long batten. When the plaster has set sufficiently the screeds can be removed and the spaces filled in with plaster, etc., or more generally are embedded in the second and finishing coats when these will be of sufficient thickness.

In other cases screeds are made in the form of little walls of cement or plaster and their faces levelled, the spaces between being subsequently filled in with the same material. See Lath, Plaster, Rendering.

SCREENS: USEFUL AND DECORATIVE

Their Choice, Construction and Renovation

For further information on the work suggested below consult Marquetry, such entries as Embroidery, Fire Screen, Lacquer, Lead Art Craft, Leather Work, Moulding, Mitre Joint, Patchwork, Plywood, Tapestry, Veneering. See also Nursery, Queen Anne St. g.

To be decorative and practical is the twofold object of the screen. Styles which, by reason of spindle-like legs or of openwork carvings on their panels, let through draughts, are only useful where they hide something unattractive; if not required for this purpose they should be admitted to rooms only on the same principle as pictures—by right of intrinsic beauty.

When choosing a screen it is worth while taking thought and trouble to secure the right type, as it presents such a large surface to annoy or please the eye, and however beautiful in itself it can mar a room by being out of key.

Reproductions of rare and artistic screens can be obtained at a variety of prices, and for durability those in leather have everything to recommend them. In brown, antique finished hide with no trimming but brass nail heads, they look their best in an oak-furnished dining room or hall, while the embossed or lightly modelled heraldic device style of

ornamentation supplies variety to the same type of screen. The quaintly patterned and coloured leather screen, with its conventional fruit and floral motifs is, when placed against a plain wall, a joy in mellow richness of tint, and the same may be said of those panelled with grouped figures after the style of various schools of painting.

The most beautiful type of leather screens are painted and lacquered. The illustration with a Chinese design might have graced a Queen Anne room (though screens were then often six-fold), or have been seen during the middle 18th century period when (Chippendale and other great designers were influenced by Chinese styles. Copies of such screens look beautiful in rooms which suggest 18th century furnishing. With certain severe types of modern interior decoration, plain gold lacquered screens may look more effective.

For the living-room tapestry screens are often suitable, and panelled with needlework



Screen. Wooden screen with mountain landscape design inlaid with coloured marquetry and with inlaid line at the edges of the panels
Courtesy of Rowley Galleries

tapestry are highly decorative. Drawing room screens may have Chippendale style mahogany frames, glass-topped and with lower panels of brocade. Sometimes beautiful old needlework is utilized under glass for this type of screen, or in combination with a gilt scroll designed frame in the French style. Cheap Oriental screens are not to be recommended, as the paper backing under the embroidered gauze is so easily split and torn.

All-glass panellled screens are decorative in suitable rooms, and are useful where it is desired that draughts but not light should be excluded. Mirror glass is used in sectional designs, and such screens tend to make a room look larger. As a general rule, glass of any kind is more suitable when confined to the upper panels of a solidly constructed wooden screen.

For a bedroom plain coloured canvas, silk or cotton material repeating an established tone in the room is restful and pleasant. A different patterned cretonne or chintz to that already draping the room should be avoided. Some people like a gathered washing material merely tied with tapes on to one of the wooden frames sold for the purpose, so that the whole thing can be washed. The objection to this type of screen is that it is not a draught preventer.

Decoration of Screens. For the nursery or living room a wooden screen can be most decorative, light and yet durable. The white enamelled example illustrated is most practical, as it is washable; the other wooden screen shown has a mountain landscape design inlaid with marquetry of coloured woods. Less ambitious designs in marquetry could be confined to the upper panels of a screen constructed after the style of Fig. 1. This screen could also be enamelled and decorated like the nursery screen illustrated. The animal pictures can be drawn freehand, traced, or stencilled and painted in oil colours. Ideas for the suitable decoration of the upper

panels of this screen will also be found in the article on Lacquer Work, and that on Enamel should also be consulted. Floral designs can be selected a pretty idea being to copy flowers from a cretonne used in the furnishing of the room. A beautiful effect can be achieved by treating the upper panels with poker work in colours (see p. 967), staining the lower panels and framework with marquetry stains. Wood carving can also be effectively introduced in low relief and incised designs.

Another form of decoration is by means of glass and lead art craft (see page 695). A screen for a hall looks well with glazed upper panels treated in this manner, the rest of the screen being stained or lacquered a bright colour. If canvas is used to cover the panels, a conventional design may first be stencilled on the fabric (see Stencilling), or designs may be embroidered in coloured wools.

Making a Screen. The three and four fold screen can be made by the amateur in many different patterns. The plain form illustrated in Fig. 1 will

serve as a guide to their construction. The plain screen can be given a decorative effect by means of the panels, which can be of ornamental wood, and many kinds of plywood are of value. Canvas in artistic shades can be stretched on plywood and used as panels.

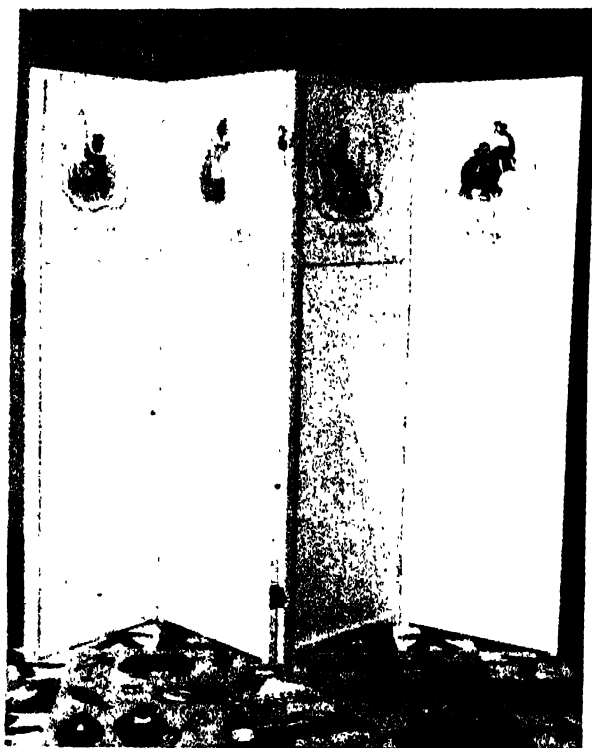
The construction of the framework of a screen is straightforward, but the material must be well seasoned to prevent warping, and planed quite straight and true. For a full-size screen the wood should be at least 2 in. by $\frac{3}{4}$ in., but 2 $\frac{1}{2}$ by 1 in. is advised. The extra thickness will make the screen heavier, but this is not a disadvantage. Before the joints are marked out, the method of securing the panels should be determined. Two methods are suitable: in one the panel is let into a ploughed groove, as in Fig. 2, and in the other the panel is held in position by strips of beading, as in Fig. 3.

The haunched mortise and tenon joint for the corners of the grooved frame is shown in Fig. 4; the grooves should be ploughed to fit the panelling and carried to a depth of $\frac{3}{4}$ in. The same joint should be made at the corners in the case of a plain frame, but the tenon will be flush with the inner edges of the frame. The choice of material depends on the panelling. If a canvas covered panel is fitted, the frame can be of deal, pine, or whitewood stained to match the material; if a decorative wood is used the framework should match the panels. The uprights and rails should be placed together in marking out, so that the position of the mortises, tenons, and shoulders can be quite accurately indicated.

In the present design the uprights are 5 ft. 6 in., and the rails 2 ft., with a 2 $\frac{1}{2}$ in. by 1 in. framework, and the top panel should be 1 ft. 5 in. high. The frames should be cramped



Screen. Four-fold hide screen with antique gold lacquer design on a cream-coloured ground
Courtesy of Waring & Gillow, Ltd.



screen. Enamelled wooden screen for a nursery, with animal scenes stencilled and painted in bright colours

up and carefully tested for squareness, and it should be noted that any carelessness in cutting the joints may cause the frame to warp. As much of the surface finishing as possible should be done before the frame is glued up if the panels are let in the framing, the final cleaning up and subsequent polishing being done in the usual way, either way or oil being preferable. The canvas covered panels are very effective, the material should be pasted on, or if it has been embroidered or stencilled in a coloured pattern it can be stretched and tacked carefully to the edges of the panels.

If beading is used it should have a rounded edge, and be secured to the frame with panel pins, the corners being mitred. An alternative design can be made to the same proportions with plywood panels of Oregon pine, a centre upright being fitted, and the panels secured with round beading. Made with deal framing and stained either brown or green, the screen is both effective and inexpensive. The divisions can be hinged with the simple hinge shown in Fig. 5, or the usual form of screen hinge in Fig. 6. The latter enables the divisions to be folded in either direction, and keeps them close together. They are both easy to fit, slots being made to take the thickness of the material.

Renovating a Screen. A canvas or other plainly covered screen that has become shabby need not be discarded as useless, for it can be easily renovated. If the framework is stout, glazed calico can be used to cover it, being fastened round the edges by brass-headed nails, and in the folds by tacks.

By means of fish glue, scissors and some bright-coloured pictures, the screen can be transformed into a gay and attractive piece of furniture for the nursery. Suitable pictures can be obtained from book wrappers, magazines, and old children's books. The pictures should be cut out neatly, brushed over with a thin coating of glue, special attention being paid to the corners and stuck on to the screen.

One fold should be finished before another is begun, and the top row should be done first. It is generally best to start at a corner, not in

the centre. It does not matter whether the pictures are the same size or not, but as they must fit exactly into the width of the screen and they should not be overlapped, it will probably be necessary to have a very wide one, or one, or two narrow ones at the end of the row. Thin white varnish, as used for lamp shades, should be brushed over the pictures to complete the work.

A screen frame can be covered with furnishing satin and decorated with shaped pieces of embroidery at the top of each panel framed by a gimp trimming, which in a wider form edges each fold of the screen. This method has been used successfully for covering an old screen, and depends on careful measurement, the neat stretching of the material over the frame and the skilful manipulation of the edging gimp. Hand embroidery or applique work can be used instead of bought pieces if more time can be devoted to the manufacture of the screen, or the scheme lends itself to all sorts of combinations of materials and colours in forming panels of pictorial patchwork.

Painting on satin provides one of the most effective ways of renovating panelled screens. The frames themselves must be in good condition, and the satin of a colour that will harmonize with the wood. Embroidery and painting may be happily combined. Designs may also be outlined in coloured beads. If white or some pale shade of artificial silk

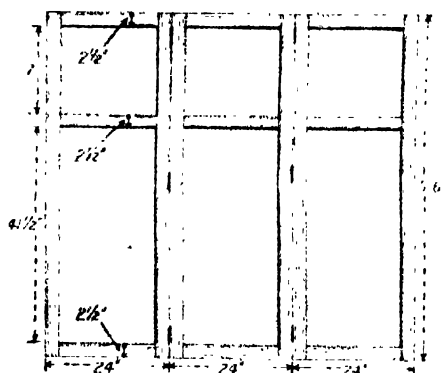


Fig. 1

or satin is used, a glass covering that will protect it from dust and yet show the work to the best advantage is essential. Worked and painted panels can be made up into screens, the cost depending on the size and style of mounting.

SCREENING: In Wire-less. This is a method of preventing interaction between two adjacent circuits by interposing a metal shield. The screening should be arranged so as to minimize both magnetic and capacity couplings, otherwise instability is liable to occur.

In simple sets a single metal sheet (usually of copper or aluminium) may suffice, but

in sensitive multi-valve receivers it is sometimes necessary to enclose the adjacent amplifying stages in metal boxes. In sets employing up to five valves the screening is normally confined to the high frequency stages. Inductance coils should be carefully placed in relation to the screening, since if the coils are mounted too close to the metal shields a marked loss of efficiency may occur. The metal work comprising the screening is normally joined to earth, and therefore to low tension negative. It is essential to insulate from the screens all wiring not at earth potential.

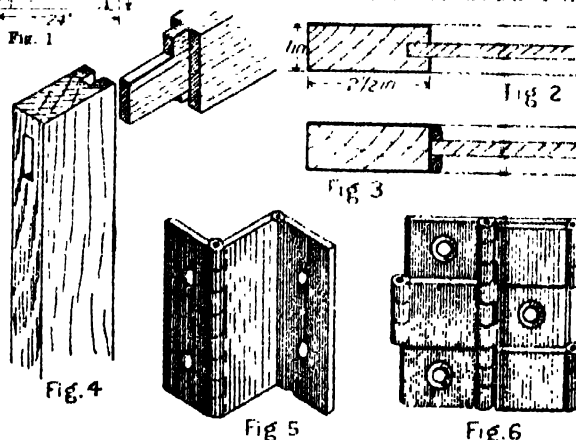
SCREW: For Wood and Metal. The screw is a cylindrical piece of metal or wood having a spiral groove cut along the whole or a considerable portion of its length. At one end provision is made for imparting a turning motion to it.

The wood screw has a tapered shank, which taper varies according to the nature and the application of the wood with which the screw is used. The thread resulting from the spiral groove cut along the shank is deeper, thinner, and spaced farther apart in the wood screw than in the metal screw. The former terminates at its lower end in a sharp point. The metal screw, on the other hand, has a fine thread of little depth and in many patterns the thread is formed along the whole length of the shank. The shank is parallel and does not terminate in a point.

In principle the screw represents an inclined plane moved by a force up or along another inclined plane. These are represented by the screw thread and, in the case of the metal screw, the thread of the screwed hole. The wood screw makes its own thread as it advances. Metal has such solid properties that only a hole of the correct diameter and shape, tipped out with a cutting tool having an identical pitch, allows the screw to be turned into it. The angle of the inclined plane is known as the pitch angle of the screw, and the spacing of the threads as the pitch. The difference of type between the two classes of screw is necessary owing to the entirely different natures of wood and metal.

The counter-sunk wood screw is designed to sink flush with the wood, and is used where an unbroken surface is required, as in a table top. The round head screw is useful where the material is too thin to permit counter-sinking, and this type is also used for its more decorative appearance. It is often joggled and used with rim locks, barrel bolts, and thumb latches.

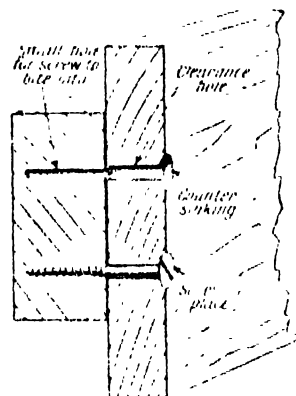
Where a good appearance is desired iron screws may be blued, tinned, or finished to match any particular work with which they will be afterwards associated. Screws for outside work can be had with a galvanized finish. Raised-head screws are a combination of the



Screen. Fig. 1. Easily made wood and canvas three-fold screen. Fig. 2. Method of securing panels by a ploughed groove. Fig. 3. Panel held by strips of beading. Fig. 4. Haunched mortise and tenon joint for framework. Figs. 5 and 6. Types of screen hinges

countersunk and round-head pattern. These are often employed with a small brass cup, or socket, for use in hardwood, where they may be removed from time to time without the risk of damaging the surrounding wood.

To enable a screw to be introduced into wood, it is necessary to bore a hole somewhat smaller in diameter than the screw. This is most conveniently accomplished with a gimlet. After the hole has been made, the screw can be driven with the aid of a screwdriver, or with a screwdriver bit in a carpenter's brace. If two pieces have to be screwed together, the screw can only bite properly into one of them, which should preferably be the thicker if there is any difference. What is known as a clearing hole is drilled in the first piece, and the termination of the hole on the face of the work should be properly countersunk. The head should draw



Screw. Diagram illustrating process of screwing in wood

the one piece towards the thicker or outer piece, ensuring a close, tight joint. If the work is not done in this way, the screw bites into both pieces of wood and will not draw the joint up tight. The plain shank will tend to jam in the hole, unless a proper clearing hole in which the shank can just turn is provided.

Driving screws into plaster is a difficult operation; either it will be necessary to fix a wooden plug or to employ one of the patent bite plugs. The method is described and illustrated in the article Plug (p.v.)

Screws for Metal. The thread and pitch of metal screws vary with particular requirements, two standard threads much in use being the Whitworth and British Association sizes. The former is the thread most commonly used in machinery, and the latter for model work and small screws generally. Except for special purposes, the thread of a metal screw is taken to the head of the screw.

Metal screws can only be driven into material after a hole has been drilled and tapped to receive them. The tapping process consists in making a screw thread of the same size and shape as that on the screw which is to be screwed into it. See Hand Screw; Stocks and Dies.

SCREW CUTTING. So far as the amateur is concerned, there are two ways of cutting a screw thread, namely, by the use of stocks, dies, and taps, or in a lathe. The first of these methods is described in the article on Stocks and Dies.

In using the lathe there is far more to be considered than a mere operating of the tool rest and the lead screw control nut of the lathe saddle. Some makes of small lathes are provided with a dog clutch on the lead screw instead of a split nut on the saddle. The first thing to do is to set the change wheels in accordance with the table of changes provided, selecting, if possible, a pitch that has an even multiple of the pitch of the lead screw. In other words, if there are 8 threads to the inch on the lead screw, then 16, 24, 32, and so on are even numbers, and the dog clutch or split nut that governs the travel of the saddle may be engaged at any point without fear of the tool failing to come up in register with the partly cut thread.

If an unequal number of threads per inch must be cut, it will be necessary to stop the

lathe at the end of each cut and line up at the chalk marks previously made at two points, the first on the mandrel and the second on the lead screw corresponding marks being made on the body of the lathe. As soon as all four marks line up the saddle may engage with the lead screw on no account before. This is illustrated in Fig. 1.

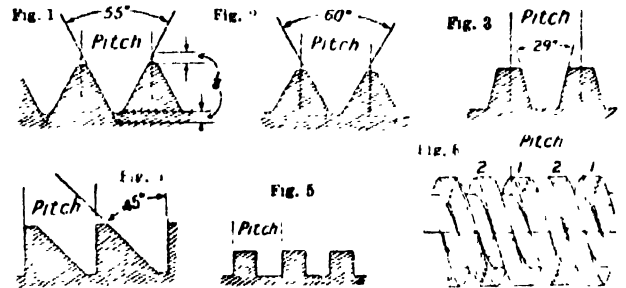
The work to be screwed is first turned to the required diameter, and a small extension, left on the end, turned to the root diameter of the thread, so as to avoid the possibility of cutting the thread too deep (Fig. 2). The work should then be placed in the lathe, either between centres or in a chuck according to its shape. Next set the tool, ground to the correct angle, in the tool rest on a level with the centre of the work, and at an angle of 90° to the lathe bed.

Now approach the tool close up to the outside diameter of the work, so as to get the first position and reading of the hand-feed index. If one is not fitted, chalk a mark on the hand wheel, then withdraw the tool a little way and place it, by means of the tool rest, about 1 in. from the work towards the tool stock. Then return the tool about one-sixth of a revolution of the hand wheel nearer the work, as indicated by the position of the chalk mark just made.

Start the lathe, having first engaged the back gear and the lead screw clutch and make the first cut, withdrawing the tool smartly when the end of the cut is reached at the same time throwing out the lead screw clutch. Then return the tool towards the tail stock to its original position and set about 5° deeper than the one-sixth just given throw in the clutch and make the next cut.

This process is repeated until the thread is of the correct depth. In the case of work that is held in a chuck, it is an easy matter to test the progress of the thread with the part into which it is to be screwed. The chuck may even be unscrewed off the mandrel without fear of upsetting the register of the tool with the thread. Where the work is placed between centres great care must be

Great care must be taken in deepening the tool at each cut, and it must be borne in mind that the nearer the thread gets to completion, the greater will be the edge contact of the tool, therefore the depth of cut must be reduced gradually as the thread nears completion.



Screw Thread. Fig. 1. Standard Whitworth. Fig. 2. International standard metric system. Fig. 3. Arne standard. Fig. 4. Buttress thread. Fig. 5. Common type of square thread. Fig. 6. Double thread.

If this precaution is not taken it is probable that the point of the tool will wedge up and break off.

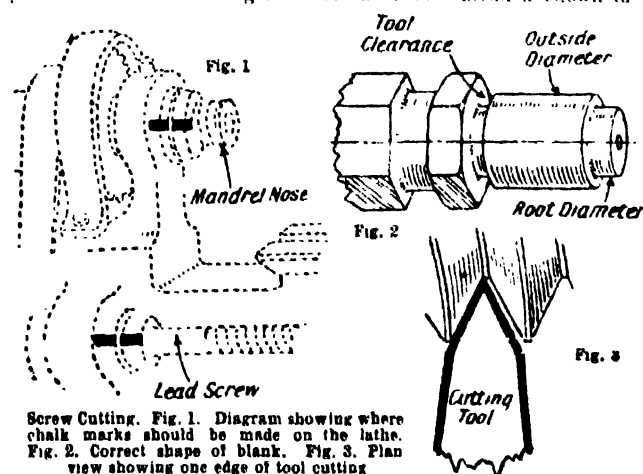
If the above points are noted little trouble will be experienced when cutting fine threads, but for coarse threads, after the first 3 or 4 cuts, the tool should be very slightly moved by means of the tool rest across the thread, so as to cause it to cut on one face only, reversing the process so that the next cut is on the opposite face (Fig. 3). The deepening of the tool is carried out as previously explained. When cutting a square thread this procedure is absolutely necessary for both fine and coarse threads. Plenty of thin oil or soap and water should be used.

Screw Threads. There are two classes of screw thread, the triangular and the square. The former is used where grip and maximum security are required, and the latter where progressive movement is necessary with as little binding or frictional effort as possible. The lead screw that operates the saddle of a lathe is a notable example; in fact, the screws of all forms of high-class machinery that are a part of the various controls are of square thread section.

The most common type of V thread is the Whitworth, which varies in pitch, i.e. in the number of threads to the inch in relation to the diameter of the bolt. The shape of the thread is shown in Fig. 1. One-sixth of the

full depth of the thread is rounded off at the top and bottom to facilitate the cutting of the thread, and to render the exposed thread of the male member the bolt, less liable to injury. Where threads are formed by the use of stocks and dies, the shape of the thread will obviously be correct, but when the thread is cut in a lathe such would not be the case unless great care is taken to see that the screw-cutting tool is ground to the angle of 55° on the cutting faces.

Other standard screw threads are B.S.F., British Standard fine, B.A.S.T., British Association screw threads, the various sizes of which are stated in millimetres; B.S.P., British Standard pipe, used for all barrel work, such as gas fitting, etc., and the I.S.T., International Standard thread (Fig. 2), better known as the metric thread. With



Screw Cutting. Fig. 1. Diagram showing where chalk marks should be made on the lathe. Fig. 2. Correct shape of blank. Fig. 3. Plan view showing one edge of tool cutting.

taken, if the work is removed, to see that the arm of the carrier that is in contact with the driving stud on the face plate is again the driving arm when the work is replaced, otherwise the work will be half a revolution out by the time the driving stud makes contact with the other arm, and this will bring the tool out of register with the thread.

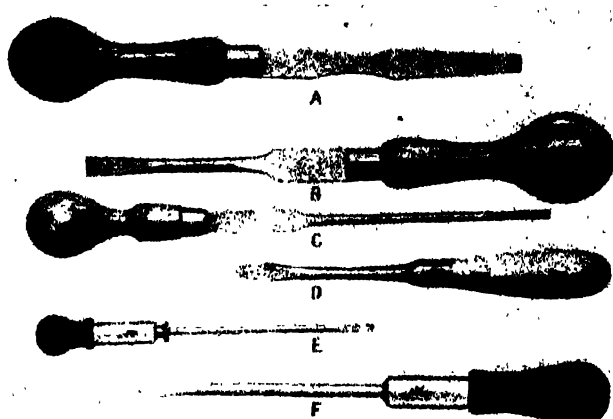
this type the angle of the thread is 60°, the top of the thread being flat and the bottom rounded. The American Standard (the Sellers thread) is practically identical with the International in regard to shape of thread, but the pitch corresponds very nearly to the Whitworth table.

Two other types are the Acme and Buttress thread. The former, Fig. 3, is a modification of the square thread, used chiefly in machine tool work where a disengaging nut is required. Owing to the fact that the thread is wider at the bottom for a given pitch than the square thread, it is much stronger.

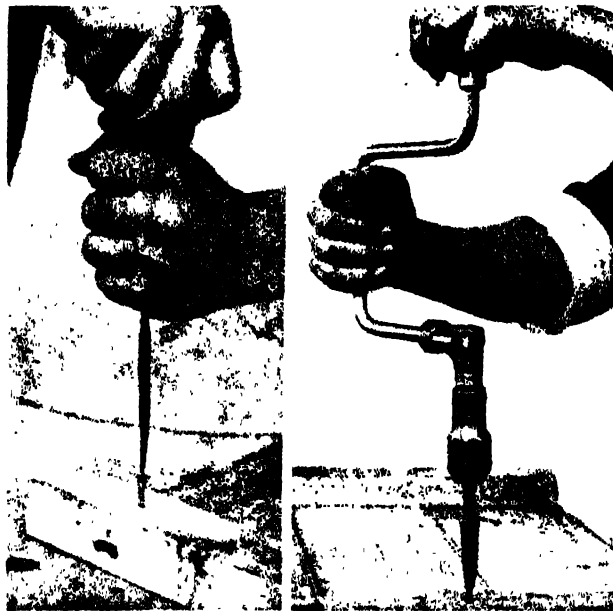
The Buttress thread (Fig. 4) is sometimes used where a screw has to resist a force acting always in one direction. It has one surface normal to the axis of the screw, like the square thread; the other, as shown, is at an angle of about 45°.

The square thread in Fig. 5 cannot be produced satisfactorily by dies, and has to be cut in a lathe. More than one thread may be cut on the same bar, it denoted, i.e. 2, 3, or more separate threads, termed leads, may go to make the complete screw, the pitch remaining the same in each case, as seen in Fig. 6. See Metal Turning, Screw, Stocks and Dies.

SCREWDRIVER: How to Use. A good screwdriver for general use is that known as the London pattern, which has a flat blade (Fig. 1, A). The cabinet screwdriver (B) with a cylindrical shank and oval or spherical handle is also a favourite. A long driver as used by electricians (C) is handy for many awkward jobs where the screw is difficult of access. In D the blade and handle are forged from one piece of steel, the handle being made up to a comfortable grip with wooden scales riveted on.

Ratchet screwdrivers (E, F) permit the blade to be kept in engagement with the slot of the screw during the whole operation of driving or withdrawal. Right or left-hand motion is secured by moving up or down a slide on the ferrule, and a centre position gives a neutral position, with the ratchet out of action. In another type the shank is spirally grooved like the shaft of an Archimede-


Screwdriver. Fig. 1. A, London pattern, which has a flat blade. B, cabinet screwdriver. C, long-shanked driver for electricians. D, screwdriver with blade and handle forged from one piece of steel. E and F, ratchet screwdrivers



Screwdriver. Fig. 2. Showing double-handed grip necessary for a large screwdriver. Fig. 3. Using screwdriver bit in brace

drill, and revolves automatically when the handle is pressed down. A spring in the working sleeve causes the handle to return ready for another stroke.

For heavy work a screwdriver bit may be used in a brace, as shown in Fig. 3, the ratchet being brought into action. If too much pressure is used, however, the bit is apt to walk off the screw head.

When driving a screw, say vertically downward, it is started in the hole by taking it in the right hand and screwing it into the hole as far as it will go easily, without risk of cutting the fingers on the sharp edge of the head. The point of the screwdriver is then put in place in the slot in the head of the screw, the screwdriver being vertical, the palm of the right hand resting on the end of the handle, and the thumb and fingers lying along the handle.

The process of driving the screw consists in turning the screwdriver to the right, while keeping a considerable pressure on it to prevent it from jumping off the head of the screw (Fig. 2). This pressure is liable to make

the screw fall over to one side if it is excessive or directed out of the true line before the screw is half way home. The fingers of the left hand are, therefore, placed loosely round the blade of the screwdriver a little above the point, so that they can act as a check on obliquity.

When the screw is right home it must not be over-tightened, since this may cause the screw threads to break the timber round them, which destroy the hold of the screw, and is particularly

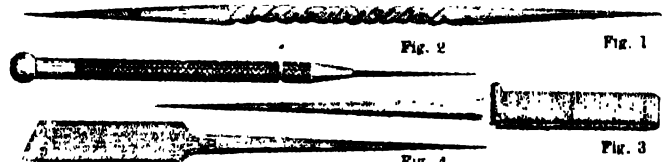
hable to happen with short or thin screws in soft woods. If it is found quite impossible to drive a screw it must be removed and the hole deepened or enlarged before the screw is re-driven. With small screws in hard timber, the screw should be withdrawn and the hole enlarged if the effort of driving becomes too great, or the screw may break.

A screwdriver seldom requires any attention if it has been correctly hardened and tempered in the first place. After a lot of hard service, however, the point may get rather bruised and rounded, when it can be restored in a few minutes by filing with a smooth file on the two long flats and right across the point, being careful to keep the actual flat point square with the length of the tool and as thick as will enter comfortably into the size screw for which the tool is meant. See Plumbing.

SCREW PINE. The screw pine, also known as Pandanus, can be successfully reared in Britain in a hothouse, if grown in a moist and sunny position in ordinary potting soil in the intermediate house. It is best propagated by means of shoots or off-sets. It will attain a height of 3 ft. or more. Pandanus Ventchii is most frequently seen.

SCREW PLATE. Used for cutting small sizes of screw threads, a screw plate is obtainable in two forms. One to hold dies consists of a flat frame of steel with an adjusting thumb screw at one end; the other is a flat plate of steel containing a number of graduated holes forming dies. The latter tool is only serviceable for the smaller sizes, since no proper clearance is possible for the chips. See Stocks and Dies.

SCRIBER: The Tool. The scriber is used for marking purposes in every kind of metal work. It is made of steel hardened and sharpened to a fine point. The double end



Scriber. Fig. 1. Pattern used by art metal workers. Fig. 2. Pocket scriber with removable point. Fig. 3. Engineer's scriber. Fig. 4. Marking tool

scraper in Fig. 1 is used by art metal workers, and is convenient to hold on account of the twisted centre. The pocket scriber in Fig. 2 is provided with a steel point which is contained in the handle when not required; the handle is knurled so that it can be held firmly. The engineer's scriber in Fig. 3 has a loop handle and one point.

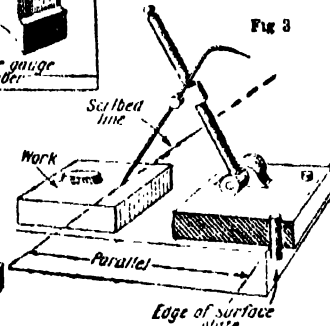
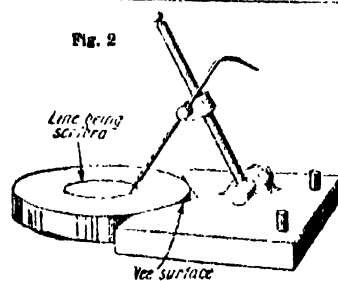
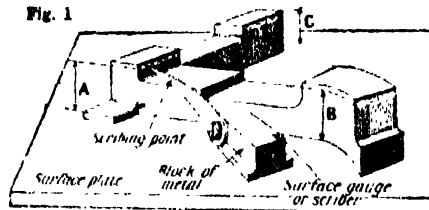
Although a marking knife is generally used for woodwork, a scribing point is sometimes necessary and both are incorporated in a marking tool, as in Fig. 4. See Metal Work; Repousse.

SCRIBING. This is the term used for the process of scratching a gauge line on wood or metal work. In fixing a dresser against a wall, it is found that the skirting board must be allowed for and the legs of the dresser cut back to permit the fixture to stand in close to the wall. This means that a line must be marked on the dresser leg showing how much stuff ought to be cut out for an accurate fit. Again, when fitting a skirting board on an uneven floor, if the board is to fit close and its top edge be horizontal, the inequalities of floor surface must be compensated by giving a suitably shaped lower edge to the skirting board.

A pair of dividers is set to the distance between wall and dresser leg, and the points locked. Then the dividers are used as a gauge, being drawn along with one leg in

contact with skirting and the other, in line, touching the dresser leg, so scratching a line on the latter showing the amount of material to be removed. When scribing the pilasters of a cupboard over the skirting, or to the wall, or when scribing a skirting board to the floor, the dividers are set to the greatest distance between the edge of the board and the wall or floor, as the case may be. See Cupboard; Dresser; Skirting Board.

SCRIBING GAUGE. This instrument is used to obtain measurements from any flat surface of predetermined accuracy. In



Scribing Gauge. Fig. 1. Simple gauge. Figs. 2-3. Better type with V-slot.

the testing and marking off of engineering components of all kinds, the surface plate or table is the basis of all measurements.

The surface is a specially prepared casting, ribbed up at the back so that it forms a rigid base for any work laid on it, and with a top surface finished off to a high degree of accuracy. The smaller plates used on the fitter's bench are surfaced to 1-10000 in. by hand scraping in comparison with another plate, or by a patented grinding process. Work of all kinds can be mounted on the surface table and with the scribing gauge surfaces may be marked out and tested, or machining and centre lines drawn on the job according to the requirements. A sheet of plate glass is sufficiently true for amateur use.

The diagram, Fig. 1, indicates how the bench surface plate and scribing gauge may be employed to mark out the levels of various lugs forming part of a casting. These lugs have to be planed off to the level shown by lines A, B, and C, which are all exactly the same height from the underneath side of the casting resting on the surface plate. The drawing at the same time shows the simplest form of surface gauge that can be made. This comprises a block of metal, the under surface of which is machined flat, and a steel arm pivoted to the block with a screw which will make it work so stiffly that it will remain in any position to which it is set. This is best accomplished by fitting a double spring washer under the head of the screw. The end of the arm should be bent over, pointed, and be made of a steel that can be hardened and tempered.

Metal work requires to be locally chalked where the scriber is to make a mark. To preserve the marks, should the chalk be rubbed off, centre-punch dots are lightly hammered along the marked lines.

Figs. 2 and 3 illustrate a scribing block of a more elaborate kind. A V-slot in one of the vertical faces of the base block is useful for working against shafts and other round objects, while for obtaining scribed lines parallel to the edge of the surface table, or from any other straight edge, two pegs may be fitted in holes in the base. The steel pegs should be a push

fit, so that they may be made to stand up or to project below the base and overhang the edge of the table or work being operated on as illustrated. The scriber is held in a universal joint clamp permitting of movement in horizontal and vertical planes.

SCRUBBING BRUSH. The scrubbing brush used in the ordinary household consists of a plain solid stock, usually of birch, set with knots of bass, bassine, white fibre, or mixture. In a machine-made scrub, a short piece of steel wire is punched crossways into each hole in the stock, pulling down with it a portion of the material used, and doubling it up to form the knot, the ends of the wire being forced into the wood at the bottom of the hole. It should be noted that the knots tightly fill the hole, otherwise there is little to prevent them soon falling out in use. Although a brush made by this process is not to be compared with a hand-drawn brush, it serves very well, provided the holes are well filled. A scrubbing brush with a long swivel handle obviates kneeling. A thick kneeling pad should be used when necessary.

SCRUPLE. This weight, used by chemists, consists of 20 grains, troy weight. Three scruples make a drachm and 24 scruples go to the ounce. See Apothecaries' Weight.

SCULLERY. In small houses and flats the scullery is often combined with the kitchen. Sometimes where the kitchen is also used for meals, a scullery adjoins, which is provided with a sink and a useful cupboard fitted for brushes, brooms, etc., and also with shelves for cleaning requisites, and pots and pans, so that washing up, the preparation of vegetables, and rough work may not have to be done in the kitchen. A neat little scullery of this type is shown in our illustration.

In larger houses the scullery equipment is necessarily more comprehensive. There are usually two or even three sinks, and various labour-saving devices may be included, such as an electric clothes washer, mangle and dishwasher. Furnishing and fittings for sculleries are on the same lines as for kitchens. See Cupboard; Kitchen; Pantry; Sink.

Scurf. See Dandruff. Hair.

SCURVY. It has long been known that scurvy, or scorbutus, can be prevented by including fresh food, especially vegetables and fruit, in the diet, and the disease is now rare, apart from war conditions. It has been found that the difference between fresh and preserved or dried food, as regards the liability to cause scurvy, consists in the absence from the latter of a complex substance called water-soluble vitamin C.

Infantile scurvy, sometimes called Barlow's disease and scurvy-rickets, although it has no connexion with rickets, has occurred in infants fed exclusively on boiled or preserved milk or patent foods.

Scurvy begins insidiously with a gradual loss of weight and strength and increasing pallor. The breath becomes offensive and the gums are soft and bleed easily, while teeth may loosen and drop out. Numerous minute haemorrhages occur into the skin.

In infantile scurvy there is great tenderness in the long bones, first in those of the legs. The tenderness is caused by bleeding beneath the covering of the bones, and this also causes definite swelling of the limbs.

The treatment of scurvy consists in giving food containing a sufficiency of vitamin C. Under the heading Diet will be found a list of foods classified according to their vitamin content. The juice of two or three lemons should also be given daily. An infant should be put on fresh milk and have a teaspoonful of orange juice three or four times a day. See Diet; Vitamins.

SCYTHE. The scythe is a garden implement which has been superseded to a great extent by the lawn mower. It is still necessary to employ a scythe, however, when grass has been neglected, or allowed to grow beyond its usual length. The blade consists of a long, curved steel, with a back of considerable thickness, set in a bent handle, with two hand pieces.

The scythe should only be used when there is plenty of room to swing it, and it should be sharpened with a scythe stone before any attempt is made to use it.

The correct manner of using the tool is shown in Figs. 1 and 2. The small handle, projecting from the main handle, or snath, nearest the blade is grasped in the right hand, and the upper handle is grasped with the left hand. The legs are placed about a foot or so apart, and the scythe is drawn back to the right, the blade being rested on the ground.

To begin the cut, the scythe should be swung around with the arms, to the left.



Scullery provided with sink and cupboard. The walls are painted and there is a tiled surround to the glazed stoneware sink. Humphrey & Peto, Ltd.

keeping the blade resting lightly on the ground, and slightly pulling the tip of the blade inward (Fig. 2). The scythe is then swung back to the right and the operation repeated, moving the feet forward slightly, and taking another cut of about 6 to 9 in. of grass, according to the length of the grass to be cut. It is convenient to begin on the left of the work, and work down the grass in a straight line, then returning to the starting point and again cutting to the right, as the tip of the scythe will be found always to come out into the space already cleared by the original cut.

Owing to the moisture in the grass the edge of a scythe rapidly loses its sharpness, which is renewed by the application of a stone, specially prepared for the purpose, shaped like the round of a ladder.

SEA HOLLY. The name of a group of hardy flowering plants (*Eryngium*) which are generally of thistle-like appearance. The flowers, when cut, are useful for indoor decoration and last a long time. The beauty of the plants lies in the blue or grey-blue colouring of the stems and thistle-like flower heads. The sea hollies are easily grown in ordinary well drained soil in a sunny place. Some of the best kinds are *alpinum*, 2-3 ft., blue; *olivaceum superbum*, 3 ft., blue; *planum*, 3 ft., small blue flowerheads; and the new variety named *Violetta*, 3 ft., violet-blue. *Giganteum* has pale grey-blue stems and flowers. The plants may be propagated by division in autumn or raised from seeds sown in a box of soil placed in a frame in spring.

SEAKALE. A vegetable valued for the young blanched succulent shoots in winter and spring. It may be raised from seeds sown in spring in shallow drills drawn at 2 ft. apart.



Seakale. Blanched heads of this popular winter and spring vegetable



Scythe: two movements in using this tool. Fig. 1 Beginning of the stroke. Fig. 2. The end

removed, and the soil between the rows should be hoed frequently. In the autumn when the leaves have died down, the roots may be lifted and forced into growth under cover. Later supplies are obtained by covering the soil over the roots out of doors, with heaps of sifted ashes or sifted soil and cutting the new shoots as soon as they begin to pierce the covering.

Seakale may be forced by lifting crowns from the beds out of doors, and placing them in a frame or house from which all light is excluded, in an average temperature of 60°. The young plants should receive liberal soakings of tepid water, and in about six weeks the seakale will be ready for cutting. If the house is not quite dark the kale will be yellow or purple in colour, and coarse in flavour.

How to Cook. Seakale is in season from February to June. It may be boiled and dished on toast with sauce poured over it, stewed or made into savouries.

To cook it, wash and trim it, then tie the heads into small bundles and plunge into fast boiling water. Boil the seakale quickly from 20 to 25 min., then drain it, untie the bundles and arrange them on a slice of toast. The sauce may be poured over or handed round. Good melted butter sauce, Hollandaise or béchamel sauce, is most suitable.

Seakale may be boiled in stock and served with brown sauce, but the brown

but the roots will take two years to reach a serviceable size. The usual method of propagation is to plant small side roots in March, in deep, rich soil, their tips an inch or two below the surface, in rows 3 ft. apart. Side shoots which appear during the summer must be

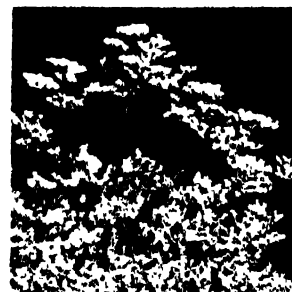
sauce must be well flavoured and be enriched by the addition of 1 oz. butter and a good squeeze of lemon juice. If seakale is stewed in stock it is better first of all to parboil it in water. Seakale may also be cooked according to any of the methods that are suggested for celery. See Celery: Sauce.

SEAL: For Sealing. Seals used for stamping hot sealing wax into a design are found in three main forms: Signet rings, fob seals, made originally to be attached to the fob and then worn on a watch chain, and the seals made for standing on the writing desk.

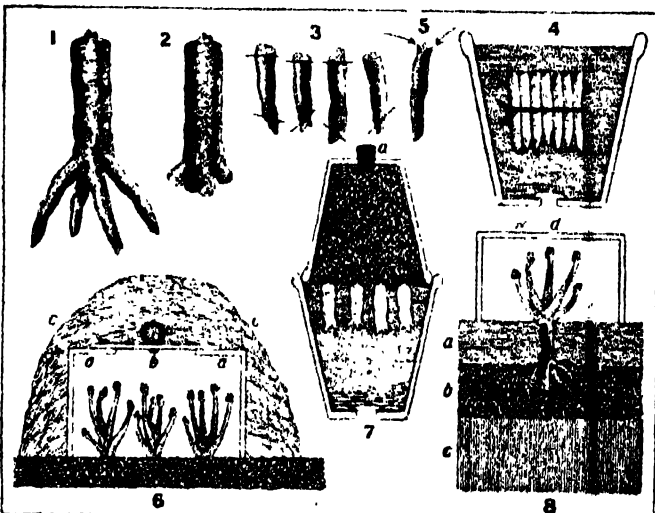
The design that is to be transferred to the wax may be a crest, a monogram, simple initials, a device, or a figure similar to that seen on a cameo. Old Roman signet rings were frequently engraved with such figures. The design is engraved in a circle or oval, usually of cornelian, onyx, agate, or bloodstone, but sometimes also of steel, brass, or gold, and occasionally of such semi-precious stones as amethyst or garnet. See Postage: Ring

SEA LAVENDER. This plant, in various forms, has flowers which, when the stems are gathered in summer, are useful for winter decoration indoors. The perennials include *Statice latifolia*, 2½ ft., lavender blue; *gueldini*, 20 in., violet-purple; and *meana*, 12 in., pinkish.

These sea lavender shrubs thrive in ordinary well drained soil and need a sunny position. Propagation is best carried out by seeds sown in early spring in boxes of soil in a greenhouse or frame. Of the annual kinds an excellent one is *Statice squata*, with blooms in various colours. Suworowi is particularly showy; it gives the best results when grown as a biennial from seeds sown in boxes of soil in July, the seedlings being potted or boxed subsequently, and kept under glass in winter, for planting outdoors the following spring.



Sea Lavender. Flower clusters of this hardy plant are useful, when dried, for indoor decoration



Seakale: the best treatment. 1. Typical crown. 2. Prepared for planting. 3 and 4. Off-sets or thongs trimmed and stored in pot of sand. 5. Thong developed for planting; two buds to be retained. 6. Forcing under manure: a, box; b, lid over sight hole; c, manure. 7. Indoor forcing in pots: a, plus for vent. 8. Outdoor culture: a, fine rich soil; b, manure; c, subsoil; d, blanching box

Courtesy of Amateur Gardening

SEALING WAX: ITS DECORATIVE USES

Brilliant Effects that Can be Obtained by this Medium

This article belongs to the group of those describing art crafts, which includes, among many others, Enamelling; Gesso; Italian Renaissance Work; Lacquer Work; Repousse Work; Stencilling

Sealing wax may be used to decorate candlesticks, boxes, vases, etc., and to make smaller articles, such as beads and pendants. It can be obtained in every colour, from delicate shades of rose, mauve and blue to black, and also in bronze colours, silver and gold.

Surfaces coated with sealing wax are of pure colour, smooth and brilliant. The composition is a fine coloured lacquer, and for this reason oriental designs are particularly good carried out in gold or silver wax on a ground of vermilion or black wax. The drawback to the craft is that the wax, being brittle, is easily chipped. The advantage is that such chips can be repaired by holding the broken surface over a spirit flame and allowing the edges of the crack to run together. When working, if not satisfied with the result the wax can be re-melted and the process started again.

The materials needed for sealing wax craft are inexpensive, and requisites for the work are stocked by most stationers and at handicraft studios where materials for art crafts are sold. All that is required is a spirit lamp, a broad-bladed knife, a wax spatula and a moulder, steel knitting-needles of various sizes, methylated spirit, and sealing wax of various colours. In addition to these, a piece of soft rag should be handy for wiping the melted wax off the tools and drying the cooled beads and pendants, a tumbler of cold water is needed, in which to cool the beads etc., and the table-top should be protected by a marble slab or small sheet of plate glass.

Making Beads. Beads can be made with sealing wax in the following manner. Heat a knitting needle in the flame of the spirit lamp, and press it into a small piece of the wax. After deciding on the colour of the beads, or on the foundation colour if they are to be multi-coloured, the wax of this colour should be broken into pieces of an appropriate size.

Having got the bead on the needle, allow it to cool, then return it to the flame and rotate slowly. The bead will gradually become oval in shape, and the shaping may be assisted by the knife. A little touch of judgement is required at this point to tell exactly the moment at which to take the bead out of the flame. If it becomes too hot the wax will drop off, and, on the other hand, unless it is sufficiently heated the bead will suffer in shape. Very little experience, however, is needed to judge this point correctly, and the bead may be cooled by dipping it into a tumbler of cold water, if the heating goes too far before exactly the right shape is obtained.

To blend other colours, two methods may be employed. The sticks may be heated one at a time and a little placed on the shaped bead. This is heated carefully and rotated slowly until the colours mingle with the foundation colour. After that it is cooled in water, dried, and passed quickly through the flame again to restore the lustre. As an alternative method sealing wax of the desired colour is dissolved in methylated spirit to the consistency of cream, and the solution is painted on the shaped bead. This method is used when designs are painted on beads to obtain something of the effect of Venetian glass.

The bead must now be removed from the needle. Heat the needle just above and below the bead, slide the bead backward and forward a few times to ensure a good hole for threading, and finally let it drop off the needle into a glass of cold water, which will set the shape. The special silk prepared for stringing heavy beads is suitable for threading, and any shape, round, flat, oblong, oval, etc., will do for the beads. Pendants or a central plaque for the

necklace are made on a piece of stout cardboard cut to shape, a hole bored at each side, and supported on a strong hairpin, the whole of the plaque covered with wax of any colour. Let the wax spread evenly over one side first by holding the plaque over the flame once or twice. When this side is dry coat the other in the same way. When the plaque is quite dry, paint or stencil a design in colours, using wax dissolved in spirit.

Decorating Small Articles. One method of ornamenting candlesticks and wooden cases, bridge pencils and other small articles suitable for a bazaar stall is to warm whatever has been chosen to be decorated, and at the same time heat the tip of the stick of sealing wax. Then, beginning at the top, dab the wax on in spots leaving a space between each spot, and every now and again hold the



Sealing Wax. Fig. 1. Brown vase decorated with apple blossom.

article over the flame, rotating slowly and always in the same direction, until the spots of wax have melted and run smoothly over the surface. Repeat these operations until the entire surface is covered.

It must be remembered that this method of decoration must not be applied to any celluloid article.

Colours may be blended by melting a second or a third colour over the first and blending all together over the flame. Silver or gold wax may thus be used to fleck the background in an attractive manner over blue, green or black.

When a raised motif is required to decorate the corners or centre of a small article, or to make a border, the spatula and moulder may be used. Wreaths, baskets of flowers and tiny designs found on flowered china are especially suitable for this work. It is best to make a few trials with the hot sealing wax on a piece of cardboard and experiment on one or two flower shapes. Roses are easily modelled.

Mark a place with a pencil on the article where the raised work is to come. Heat the wax in the flame of the spirit lamp and let a tiny drop fall for each flower. Use two shades of pink for a cluster of roses and put several drops one over the other. Then, while the wax is still plastic, press with the spatula round the centre and make little separate dents to form petals and a dent in the middle of these for the rose centre. Heat the tool a little if the wax becomes hard. The tiny leaves may be made of green, silver or gold wax and consist of a drop of wax, the spatula being drawn quickly through to make a central vein and shape the leaf.

Enamelling with Sealing Wax. The most artistic effects in sealing wax decoration are obtainable by using solutions of the different coloured waxes in methylated spirit. This

inexpensive craft has the appearance of fine enamel work and can be used on a ground of sealing wax to decorate beads, or on wooden articles covered with the wax, or on pottery and glass.

The first step is to choose the article to be so enamelled, and to decide upon the colouring. Then break up a stick of sealing wax and place it in a small bottle, covering it with methylated spirit. Cork tightly and leave overnight to dissolve. Shake it up well. Use in the same way as liquid enamel, a small sable brush is the best tool to employ.

Colour the design, attempting no shading, and working quick and evenly. Practice is required to prevent the work from being patchy. The pressure on the brush must be even, and the sealing wax must be kept stirred. If it is too thick dilute it with methylated spirit. Keep the bottles well corked, and clean the brushes in methylated spirit. The shading is added when the first coat is dry.

One section must be done at once and allowed to dry, as the work is ugly if the enamel is thicker on one side than another. As the work is dry in a very short time, it should appeal to those who have nowhere to put things during the drying process.

The illustrations give a good idea of the possibilities of this form of handicraft. Fig. 1 is a useful flower vase. Its colour is dark brown, and it is decorated in white sealing wax shaded with lawn, the design being a ring of conventional apple blossom. Fig. 2 is a vase of white crackle ware, its decoration being done in sealing wax enamel representing multi-coloured anemones. Fig. 3 is an alabaster powder box. The design on the lid, which was outlined entirely in black, shows brightly coloured flowers and leaves painted in sealing wax enamel. Geometrical designs and the Greek key pattern are also suitable.

SEALSKIN. The beauty and the durability of sealskin make it one of the most valuable furs in existence. It is usually



Sealing Wax. Fig. 2. Vase of crackle ware ornamented with a design of anemones. Fig. 3. Powder box in alabaster, with decorated lid.

made up into coats but is also used for coat collars and cuffs.

Musquash is often treated to resemble sealskin, but may usually be recognized by its size. A large number of musquash skins are needed to make a coat, so that the seams are numerous compared with those on a genuine seal. Coney and electric seal, made from rabbit skins, are other substitutes. Those who find it difficult to distinguish between genuine and imitation skins should examine the leather. In real sealskin this is never dyed, while in musquash and other imitations it is invariably of the same shade as the fur itself.

Sealskin is also imitated in a special kind of silk plush. This seal plush is generally dark brown or black, and is used for making winter coats, for trimmings and for travelling rugs. See Fur.

SEALYHAM. This type of terrier is a breed of small dog that has, during the 20th century, become very popular and fashionable. Founded upon a hybrid between the Jack Russell and Welsh terriers by later crossings



Sealyham Terrier. Favourite breed of small sporting dog.
Photo Tice Hall

than it is owing to the long moustaches. The colour is uniformly white, or there may be patches of black or liver colour. Occasionally it is brown marked with black.

The smaller specimens are the more desirable. The Sealyham is affectionate and faithful, playful and of quick intelligence. Intruders are greeted with continuous barking. A first-class dog for the home, it is withal a splendid ratter. As a sporting dog, he is esteemed for badger-hunting, for which his short legs and pluck fit him, whilst his steady baying enables the hunters to locate him and his quarry. The name is derived from the Edwardes estate, in Pembrokeshire, where the breed originated. See Dog.

SEAMS FOR PLAIN SEWING

Some Helpful Directions for the Needlewoman

This article suggests reference to such entries as Dressmaking; Mending; Pattern; Sewing Machine, and also to various stitching operations, e.g. Hem; Herringbone-Stitch; Overcasting, etc.

The plain seam is the one most commonly used in needlework. To make it, lay together the two pieces of material to be joined with the right sides facing and the two edges exactly level, and tack along the two thicknesses where the permanent stitching is to be put in. It is a good plan, when a garment is being cut out with the aid of a paper pattern, to mark the material round the pattern edges with chalk, so that, after the pattern is removed, there is a guide to the amount of material that should be taken up in seams, etc. After tacking carefully stitch the seam by machine, or, if small light articles are being made up, run the seam by hand if preferred, as in Fig. 1.

The stitching of all seams of garments should be commenced at the top, i.e. the waist of a skirt, shoulder of a sleeve, and so on. If one of the two edges is on the cross or bias of the fabric, it should be laid uppermost, as it is apt to stretch out of shape. When stitching a shoulder seam, always ease in the back shoulder-edge and stretch the front, in order to get a better fit over the shoulder blades.

It is the custom, when stitching seams of dresses or coats that take a concave curve at the waist, to stretch this part of each seam, so that it will still more follow the curve of the figure. Seams that take a convex curve are held in, so that they will not stretch, otherwise the shape would be spoiled. In stitching the seams of a 2-piece coat sleeve, commence by stitching the shorter or inner seam, and do the longer or back seam afterwards, easing in the elbow part of the wider or upper portion to the elbow part of the narrower portion, so as to give it more play at the bend of the arm. After any plain seams are stitched, remove tuckings, and iron the seam edges open flat. If the seams are curved, however, be careful to snip the turnings here and there, evenly and regularly,

with the Dandie Dinmont and the Cheshire terrier, its characteristics have become fixed and it breeds true to type.

It has short legs, a long body, strong neck, deep chest, and the short tail is carried vertically. The coat is short and hard, with crinkly, broken upper coat on the back. The drop ears lie close to the face, the powerful muzzle appears broader

top of the fold; then stitch the two layers together again, close up to the raw edges, as in Fig. 4, so that these are enclosed in a little tube.

Flat Seam. The stitch and fold seam is employed for flat seams. Lay together the two pieces to be joined, with right sides facing and one edge nearly $\frac{1}{4}$ in. below the other; then tack along an $\frac{1}{4}$ in. below the narrower edge, and afterwards machine, run, or back stitch along this line. Fold the whole seam flat over on to the material, so that the narrower edge lies underneath, fold the edge of the wider turning under, and neatly hem down, as in Fig. 5.

Oversewn Seam. The top-sewn or oversewn seam is used when it is desired to join the selvages of longcloth, calico, cambric, and similar cotton materials. Tack together the two selvages and neatly oversew, working from right to left, as in Fig. 6, and making the stitches of an even slant. No knotted ends of cotton should show. Leave a generous end of the cotton, and push it down on to the edges towards the left, so that the stitches can be made over it, at the same time not letting it drop below the position at which the needle passes through the edges. When the seam is completely oversewn, open out the two thicknesses and lay them flat on the table, and press the stitches down with the thumb to make the seam flat.

Counter Hem Seam. A counter hem figures largely in the making of men's and boys' shirts, in which a specially strong, flat seam is wanted. Turn under one edge to the wrong side about $\frac{1}{4}$ in. and turn the other edge over to the right side to match. Lap one edge over the other so that the raw edges face, and run a line of tacking down the middle, then machine both edges down as close up to the folds as possible. If desired, hemming may be resorted to, instead of machining, as in Fig. 7.

Flannel Seam. On flannel materials, it is usual to use a stitch-and-herringbone seam. The edges are first stitched by hand or machine in a plain seam, which is then pressed open flat with the fingers, and the raw edges herringboned down, as in Fig. 8, the material being too bulky to permit of turning the edges under, as for hems.

Whipped Seam. When the edges of fine underwear or baby clothes are to be joined to lace, insertion, or beading, a whipped seam is generally employed. Take the material in the left hand, with the wrong side towards you and raw edge upwards, and roll this raw edge over towards you as a very tiny roll, with the thumb and first finger of the left hand, doing about 1 in. Let the roll rest over the first finger, with the beading or lace above, and whip them together as shown in Fig. 9, drawing the two edges together.

If the material is to have fullness, as in the case of a skirt part that is to be joined to a bodice by a band of insertion, the skirt edge must be rolled and whipped separately from the trimming, pulling up the cotton as the work proceeds in order to get the requisite fullness. After the edge is completely rolled and whipped, it is oversewn to the trimming exactly over the first stitches, so retaining the neat effect of the seam. This rolling and whipping can be used to apply a frill to an edge, the frill, if full, being rolled and whipped and drawn up, while the garment edge is afterwards rolled, and whipped to the frill as explained for beading.

Openwork Seams. Many blouses, summer dresses, baby clothes, etc., show openwork seams, which often have the effect of real hem-stitching. It is usually necessary first to hem or roll and whip the two edges that are to be joined, though in some cases a mere

as in Fig. 2, otherwise it will not be possible to iron them flat, the material under the seam edges will become dented or cockled up. Many seams have their edges notched or snipped out in this way, even if they are not curved, merely to give a better effect and to prevent the edges fraying out too rapidly.

Unless the raw edges of these plain seams are to be covered with a lining, they have to be finished off. In dresses it is usual to overcast the edges, as in Fig. 2. In unlined coats or wraps, the edges are bound with lute ribbon or Prussian binding, the binding being folded double, so that the seam edge can be stitched between. In some silken materials that have little tendency to fray, such as tulle, the edges are merely pinked out, in heavier materials of this nature, such as velours, they are often pinked out or herringboned down.

Overlapped Seam. This seam is applied in the making of outer garments, and also on underclothes, pyjamas, etc. It may be used to make skirt seams to set in yokes, and to attach strappings. It is easily made. Turn in the edge that is to be uppermost, to the amount of turning allowed, and tack along, then lap it on to the remaining edge, and again tack down, as in Fig. 3. Machine as far within the fold as desired, taking care not to go beyond the edge of the turning. The raw edges can be neatened in any of the ways previously mentioned.

French Seam. A seam often employed on delicate materials, such as lawn, muslin, crêpe de Chine, net, lace and georgette is the French seam. To make, set the two layers of material together, with the wrong sides facing and raw edges level, and run or machine as close to the raw edges as possible. If it is not easy to stitch as near to these as is desired, cut the turnings away quite narrow afterwards. Now turn the material to bring the wrong side outside, and the seam lying along the

turning in of the edges will suffice. After the two edges are neatened, tack them down on to a strip of stiff paper, with the desired space between, and make the openwork stitchery, with embroidery silk or embroidery cotton, according to the nature of the fabric.

One type of hand-worked seam is shown in Fig. 10. There are several others, simple herringboning being one that is much favoured, while another popular method is faggoting (see page 440). In all instances, the needle should be slipped along one of the hems to bring it out to the right side in the position needed for making each stitch or group of stitches. After the stitchery is worked, the facings are snipped and the paper removed. Openwork can also be used to attach lace to the neaten edges of underwear, etc.

SEA PIE. For this popular dish the following ingredients are required: 1 lb. buttock steak, $\frac{1}{2}$ lb. flour, 5 oz. suet, a carrot, an onion, a small turnip, and pepper and salt to taste. Cut the meat and the vegetables into thin slices and place these in layers in a saucepan, seasoning them with salt and pepper and covering them with cold water.

Let the whole simmer for $\frac{1}{2}$ hour, and then remove the meat from the pan. With the suet, flour, and some water make a light crust and roll it out on a floured board. Roll the meat in this crust, return it to the saucepan with the vegetables and the liquor, and let it simmer for an hour.

Sea Pink. This is an alternative name for the plant more usually known as thrift (q.v.).

SEA SICKNESS. The effect of the up and down motion of a ship in the water is comparable to that produced by swinging, and in many people it produces a feeling of nausea and sickness, which culminates in vomiting and complete prostration. The scientific explanation of this troublesome malady is that it is due to a disturbance of the circulation in the brain and in the labyrinth of the ear.

While serious results are very rare, there is always some danger to those who are of apopleptic tendency, to sufferers from heart disease or rupture, and to pregnant women.

For three or four days before starting a voyage cure should be taken that the food is readily digestible. The bowels should be

regulated if necessary. At the same time, a dose of 20 gr. of the bromide of ammonium may be taken three times a day, in a wine-glassful of water after meals. This treatment may be continued during the first few days of the voyage. If the voyage is a short one, a single dose of this drug (30 gr.) should be taken about two hours before starting. Chlorotone is often a preventive. A light meal should be taken $1\frac{1}{2}$ to 2 hours before the voyage. A firm bandage worn round the abdomen often acts to some extent as a preventive of sickness.

A person who is apprehensive of being sick should sit in a low deck-chair, either facing or with the back to the bow of the ship. The chair should preferably be on deck, but in a sheltered part. A safer position still is to lie down, preferably on the right side, and bring the knees well up towards the body. Above all it is essential to keep comfortably warm. If sickness threatens, it is best to abstain from solid food, to suck chips of ice, or to take a glass of iced champagne in sips. When there is much nausea, but no vomiting, the stomach will be relieved by taking a pint of warm water to which a pinch of bicarbonate of soda has been added. This will empty the stomach and make the traveller more comfortable. When vomiting has continued until the stomach is empty, and distressing retching ensues, a little light food should be taken, if possible, such as gruel, arrowroot, warm milk and water, or milk and sodawater. If the sickness continues for some days other treatment will be required from the ship's doctor.

SEASONING. Every variety of spice or herb which imparts a relish, or brings out more distinctly the flavour of ingredients used for culinary purposes, is a seasoning. The term does not always imply mere salt and pepper, although salt may be reckoned to be seasoning of the first importance. Next in order would come the various descriptions of pepper and herbs, such as are used in forcemeats.

Seasoning is largely a matter of individual taste, therefore quantities even in recipes should not be too strictly adhered to. The safest way is to taste while cooking until the correct amount of seasoning has been added. See Flavouring. Ginger. Nutmeg. Pepper. Salt. Sauce. Soup. Spice. Stuffing, etc.

SEAWEED: Its Uses. There are several kinds of edible seaweed, but few of them are eaten except in the neighbourhoods in which they are found, and even then only in limited quantities. The most valuable of them is known as Irish or carrageen moss. It contains certain medical properties and is recommended for invalid diet. Another kind of seaweed, found along the Welsh coast, is sometimes used as food, and in Scotland some varieties of seaweed are also edible. See Irish Moss.

SEBORRHOEA. Certain conditions of the fat-producing glands of the skin cause an abnormal amount of secretion. This is known as seborrhoea or pityriasis, and is of an oily or a dry character, the latter taking the form of greyish or yellowish scales. The condition always begins on the scalp, from which it may spread downward to the face, neck, and other parts of the body.

The local treatment for dry seborrhoea of the scalp is given under the heading dandruff. Where the scurf attacks the non-hairy portions as well as the scalp, a mild sulphur ointment such as the following may be lightly rubbed in once or twice a day:

Precipitated sulphur	24 gr.
Benzonated lard	1 oz.

Local treatment of oily seborrhoea consists in washing the surface several times a day with soap and warm soft water and then dabbing on the following lotion:

Fannic acid	10 gr.
Methylated spirit	2 oz.

SECATEURS. The small hand instrument known as secateurs has two very short cutting-blades, fastened together by a rivet, and actuated by a spring after the manner of clippers. It is invaluable for pruning in the garden. See Pruning.

SECRETAIRE. For all practical purposes the secretaire is identical with the bureau or the desk, but the name is retained by certain pieces of furniture, mainly those of French make.

Secretaires in which the influence of French models is seen were made by Sheraton. Some of these were shaped somewhat in the style of a cabinet. See Bureau; Marquetry. Sheraton; Writing Table.

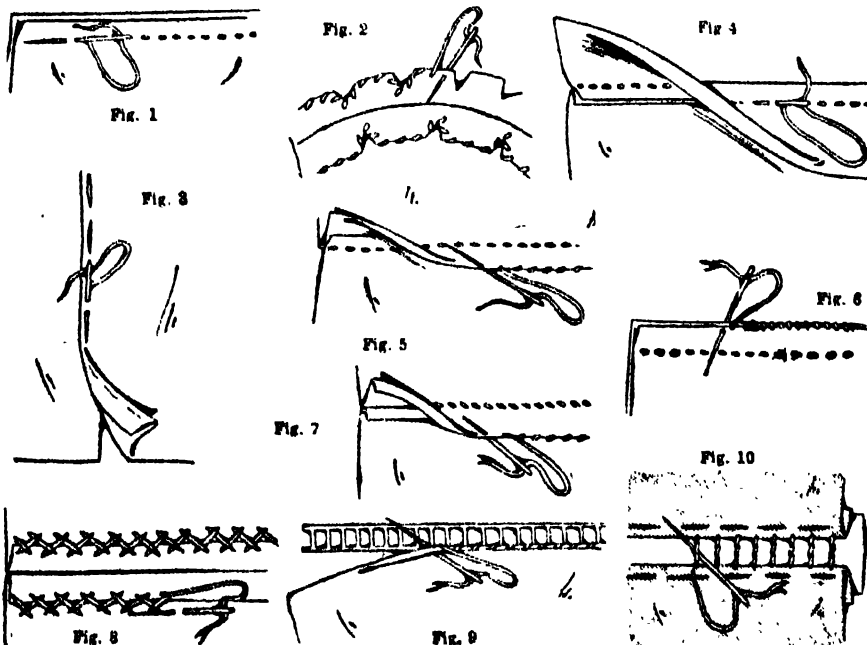
SEDATIVE. Any drug used to calm an excited nervous system, to relieve restlessness, to quiet an overstrung heart, or an irritable stomach or bronchial tubes, etc., may be termed a sedative. As most of the so-called nerve sedatives have a greater or less depressing action on the heart, they should be used with caution, and never taken except under a doctor's supervision.

SEDGE. Under this name are included hardy perennial grasses, one or two of which are useful for the purpose of decorating moist spots in gardens, or by the sides of marshes in the wild garden. They are propagated by division of the plants in spring. *Pendula*, 5 ft. is one of the best. Those with variegated leaves, i.e. *Acuta variegata* and *Gallica variegata*, are attractive. See Japanese Garden; Wild Garden.

Sedum. This is the botanical name of stonecrop (q.v.).

SEED: For the Garden. Every seed is really a plant in miniature, containing the embryo, together with the food required to assist early development. To stimulate its growth, warmth, moisture, and air are necessary. Given these conditions the plant sends forth its radicle, or young root, into the earth, whilst the young stem bursts through the seed covering, gradually lifting the soil and making way for the seed leaves. After this has occurred, true leaves form and hair roots develop.

Seed should not be sown during very cold or frosty weather, but from February onward, when there is gentle warmth from the sun and while the soil is in a friable condition without



Seams. Fig. 1. Plain seam run by hand. Fig. 2. Notched and overcast edges of a curved seam. Fig. 3. Overlapped edge. Fig. 4. French seam. Fig. 5. Flat seam. Fig. 6. Oversewn seam for calico selvedges. Fig. 7. Counter hem. Fig. 8. Seam in fannel with edges herringboned down. Fig. 9. Beading seam for underwear. Fig. 10. Openwork seam.

excess of moisture. Seeds always germinate best in darkness, and consequently sowings made in pans, pots, or boxes should be covered with glass, over which is spread a sheet of paper to exclude both sunshine and light, as well as to conserve moisture and maintain some degree of warmth. As a general rule seeds should not be more than a year old, as their vitality becomes weaker with age, and slower germination results; some even become quite sterile.

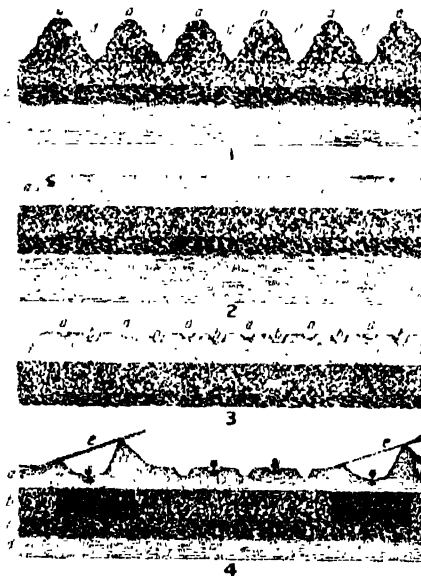
Plants can be raised from seed in various ways, e.g. sown broadcast, in drills, in prepared beds, in cold frames, on hotbeds, and under cover of a greenhouse. Some seeds possess a hard covering and, consequently, are more difficult to germinate speedily; this may be facilitated by slightly notching the hard coat, taking great care not to cut deeper than the outer covering (or testa, as it is termed botanically). Another method is to soak the seeds for a few hours previous to sowing.

Depth of sowing depends upon size of seed, and to some extent upon weather conditions. Some tiny seeds need hardly be covered at all, whilst large seeds like beans and peas should be sown deep, to ensure the greater degree of moisture requisite for their germination. Our diagrams show sowing methods in detail.

Seed Bed. A properly made-up seed bed is of great service in the garden for raising seedlings of flowering plants and vegetables to be afterwards planted out. The soil should be dug, and the surface pulverized; the addition of sand and sifted leaf mould is beneficial on heavy land.

Draw drills to the required depth, with a stick or hoe, setting the line carefully to ensure straight drills. After sowing seeds, and before removing the line, label each row according to its contents, including date and weather conditions. Labels are commonly made of plain wood painted with white fluting.

Seed Testing. In Great Britain, an Act of Parliament passed in 1920 made it obligatory for a seller of seeds to give to the buyer a written statement of the variety, purity, and germination of the seeds in question. Seeds must not contain more than a certain minimum percentage of injurious weeds. There is an official seed-testing station at Cambridge. *See* Seedlings; Sowing.

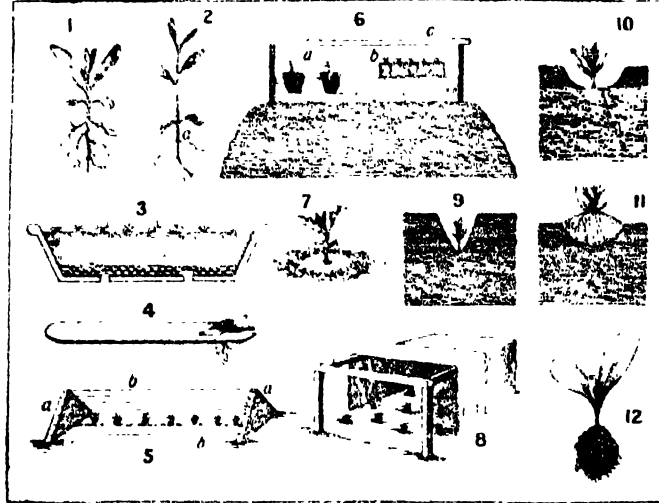


Seed. How to prepare a seed bed. 1. Autumn preparation; a, ridged top soil; b, manure; c, well dug bottom soil; d, sand or exhausted manure. 2. Bed prepared; a, ridges and sand incorporated. 3. Sowing; a, seed covered in; b, rain channels. 4. Hardy and tender seedlings in one bed; a, top soil prepared as in Fig. 1; b, pockets of extra manure under tender seeds; c, manure; d, bottom soil; e, glass-covered shelters propped up and facing south.

SEED CAKE. This cake derives its name from the caraway seeds that are added to a plum cake mixture.

Seed rock cakes are made by adding 2 or more teaspoonfuls caraway seeds to every $\frac{1}{2}$ lb. flour used, as in making ordinary rock cakes. *See* Cake; Rock Bun.

SEEDLINGS: Their Care. After seedlings have formed their first true leaves they require special attention. In the open ground



Seedlings. 1. Sturdy seedling. 2. Attenuated specimen. a, where damping off begins. 3. Seedlings pricked off into a pan. 4. Notched stick for lifting tiny seedlings. 5. Effective protection against birds; a, nails in wood triangles; b, black cotton. 6. Seedlings under frame on hotbed; a, plunged pots; b, box of seedlings; c, light. 7. Soot protection against slugs. 8. Sun protection. 9. Planting for protection against frost. 10. Planting in depression to conserve moisture. 11. Same earthed-up during bad weather. 12. Seedling lifted with a ball of soil.

transplanting should be performed as soon as seedlings can conveniently be handled, whilst those raised in the greenhouse should be placed close to the glass.

Great care is essential at this stage to avoid overwatering, giving the tiny plants just sufficient water to keep them moist; overwatering is one cause of damping off (q.v.).

Seedlings should be carefully thinned out, and in due course transplanted to form sturdy plants for garden and greenhouse. Very tiny seedlings, like those of the *gloxinia*, should be handled by means of a small stick, notched V-shape at one end, as shown in our diagrams, which also indicate other ways of dealing with young and fragile plants. The smaller seedlings often produce the finest mature plants.

SEIDLITZ POWDER. Mixture of potassium and sodium tartrate and sodium bicarbonate wrapped in blue paper, and tartaric acid wrapped separately, in white paper. The powder in the blue paper is dissolved in half a tumbler of warm water and the powder in the white paper is then added. The mixture is taken (preferably half an hour before breakfast) while it is effervescent as a mild purgative and to relieve liver disorders. The name derives from a mineral spring in Seidlitz, Bohemia, though the composition of the powder does not correspond to that of those waters. As a Seidlitz powder is a saline purgative its use should be only occasional.

SELAGINELLA. This family of green house moss-like plants thrive in a mixture of loam, leaf-mould, and sand. The plants require a shady position, and can be propagated by means of cuttings at any time of the year. They are evergreen, of erect, dwarf, or trailing habit. They succeed in a temperature varying from 50 deg. to 55 deg. from September to March, from 55 deg. to 65 deg. for the rest of the year.

SELECTIVITY. In wireless reception this is the ability of a receiving set to dis-

criminate between desired and undesired broadcast transmissions. In considering the question of selectivity, attention must be given also to sensitivity and quality of reproduction (or fidelity), because all three factors are interrelated.

The selectivity of a receiver is directly proportional to the number of tuned circuits, and it can be increased by adding an extra tuned circuit between the aerial and the input to the set.

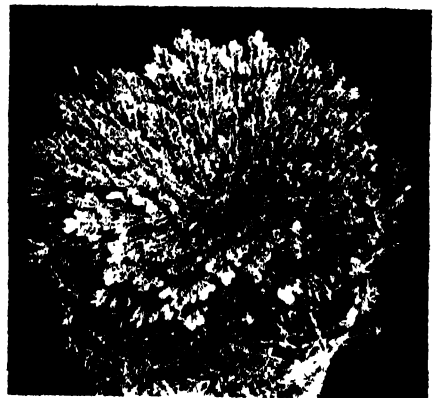
This procedure may have an adverse effect upon the sensitivity, and in practice one or more high-frequency amplifying stages are usually employed in order to provide at one and the same time a gain in selectivity and sensitivity. The high-frequency amplifier more than compensates for any loss in sensitivity occasioned by the use of selective circuits.

The degree of selectivity is largely affected by the efficiency of the tuning inductances. A coil having high losses due to the use of too thin wire, an unsuitable ratio of diameter to length, large self-capacity, etc., will cause damping, a factor which flattens the tuning and

so reduces the ability of the receiver to separate stations. Circuits containing coils with relatively large inductance and condensers of small capacity are desirable from the point of view of selectivity, because weaker couplings between the stages can then be used without any appreciable loss in signal voltage.

A long aerial-earth system is detrimental to selectivity. A short single wire outdoor aerial, or a small indoor aerial or frame is, therefore, indicated. The earth lead should be taken to its earthed point by the most direct route. A good earth, and an aerial which is free from high resistance points (which means that all joints should be soldered), are absolutely essential.

The aerial should be loosely coupled to the grid circuit of the first valve, either by way of a tapping point along the grid coil or by using a separate small aerial coil inductively coupled to the grid coil. An equivalent effect can be obtained by inserting a small fixed or variable condenser in series with the aerial lead, a



Selaginella. An evergreen, moss-like plant needing greenhouse cultivation.

available value for the medium broadcast waveband being 4000 mfd.

Reaction, when intelligently employed, greatly improves the selective properties of a set. One of the difficulties in designing a receiver to give high selectivity is the possibility of high note loss. If the tuned circuits have very low losses, so that the tuning at resonance causes cutting of the side bands, there will be a decrease in the high note response, the magnitude of which will depend upon the extent of the side band cutting.

This can be remedied by employing a band-pass filter, comprising ganged tuning circuits prior to the first high-frequency amplifying valve, the high-frequency stage or stages being either choke coupled or coupled by flatly tuned circuits.

The band-pass filter can be designed to pass a predetermined band of frequencies, such as a band of nine kilocycles in width. An alternative is to use a number of tuned high-frequency stages having each tuning circuit comparatively flatly tuned, the required degree of selectivity thus being achieved gradually. This entails a multi-valve receiver. It will therefore be seen that in the case of small wireless receivers the degree of selectivity is a compromise involving sensitivity and quality of reproduction. Thus in a two or three valve set operated in the vicinity of a powerful broadcast transmitter if the selectivity is sufficiently high to ensure the elimination of the nearby transmission within a few degrees on the tuning dial or dials, the sensitivity on distant transmissions may be decreased.

In general, a well-designed receiver provided with high-frequency amplification will be both selective and sensitive, whereas the degree of selectivity obtainable in a small set without high-frequency amplification is mainly limited by sensitivity and fidelity. The use of the superheterodyne principle is a method by which high selectivity may be obtained with the retention of simplicity in operation. See Superheterodyne, Wireless.

SELF HEAL. The common name of prunella, a low-growing hardy plant suitable for poor soil in odd corners. *Prunella vulgaris* is a troublesome lawn weed. The best of the cultivated kinds are grandiflora, purplish, and Webbiana, rose purple.

SELF-STARTER : On Motor Cars. Unlike the steam engine and the electric motor, which can be started by the opening of a valve or the use of a switch, the internal combustion engine must be rotated first before it will commence to operate. The name self-starter has been applied to the electric starter, now a standard fitment on practically all classes of motor vehicles. See Starter.

SELF-TONING PAPER. Self-toning paper is a photographic printing-out paper, the film of which contains the chemicals necessary for producing a pleasing tone. All that is required with most brands of self-toning paper is to wash it for about 5 min., and fix and wash again in the ordinary way. Gelatino-chloride self-toning papers, such as Ilford Intona, do not require the preliminary washing. Collodio-chloride, or collodion, papers require the initial washing. All self-toning papers have to be printed much darker than ordinary P.O.P., as a good deal of depth is lost in the fixing bath, which is really a combined toning and fixing bath. This applies particularly to the collodion papers.

For all self-toning papers a plain hypo bath of 2 oz. to 3 oz. of hypo to 1 pint of water will give good brown and warm sepia to purple tones according to the brand of paper used. See that the prints are properly fixed, and the instructions as to time for fixing which are given with each paper carefully followed. The hypo bath should not be too strong

for collodion papers, 2 oz. to 3 oz. to the pint, while variations in the strength of the bath do not affect the colour of the print. The normal bath preceded by washing gives a pleasing brown tone, but cold purple tones can be obtained by washing before fixing in a 10 per cent solution of common salt (1 oz. salt in 9 oz. water) and rinsing the prints in fresh water.

All baths, whether salt or hypo, must only be used once with self-toning papers. Not more fixing solution than is necessary to cover the print properly should be used, since the gold toning chemicals are on the face of the print itself. If too big a bath is used they will be diluted too much. Fixing baths for self-toning prints must not be acid, to make certain of this a few drops of ammonia, or 10 gr. of sodium carbonate, may be added to each pint of the solution. Self-toning prints, as P.O.P., must be well washed after fixing. One hour in running water or 5 min. in each of 12 changes of water is necessary. See Toning.

SELTZER. Originally this was the name of a mineral water obtained from Selz in Germany, but to-day the word is used for certain artificial preparations that resemble, more or less, the natural water. Seltzer is a highly aerated alkaline water that contains bicarbonate of sodium, calcium, magnesium, sulphate of potassium, and similar salts. It is valuable in cases of chronic indigestion and disorders of the respiratory organs. See Mineral Water.

SEMOLINA : As a Food. Being a product of wheat, semolina contains considerable nutritive qualities and makes excellent milk puddings, but unless flavoured is rather insipid. The flavouring, such as lemon, nutmeg, or cinnamon, should be added when boiling the semolina with the milk so that it may be equally distributed.

To make a semolina pudding, put 1 pint milk into a stewpan with a strip of lemon rind and a pinch of salt, and bring to the boil, then sprinkle in 2½ oz. semolina, and stir over the heat for about 10 min. to cook the grain. Beat together the yolks of 2 eggs with ½ oz. castor sugar. Remove the pan from the heat and take out the lemon rind; when slightly cooled add the yolks of the eggs and sugar, and lastly fold in the whipped whites of the eggs. Turn into a greased pie-dish and bake for 15 to 20 min. in a moderate oven. For quite a plain pudding omit the eggs, and add the sugar just before putting the pudding into the oven.

Semolina Blancmange. Boil up a quart of milk, then sprinkle in ½ lb. semolina, and stir well until the latter is cooked and the mixture thick and creamy. Add the grated rind of a lemon and 3 dessert-spoonfuls castor sugar, and when the latter is thoroughly dissolved pour the mixture into a wet mould.

When the blancmange is set, turn it on to a dish, heap a small tinful of cherries round it and pour the syrup round. Cream should be served separately.

Semolina Cheese. For this savoury take 3 tablespoonfuls semolina, 2 oz. each margarine and grated cheese, a little milk, and pepper and salt to taste. Boil the semolina with the margarine and half the cheese in a very little milk, and season it with pepper and salt. When cooked, turn out the mixture into a pie-dish to cool, and then cut it into small,

round cakes. Arrange these on a well-greased dish, sprinkle them with the rest of the cheese, and bake them for about ten minutes in a hot oven.

Semolina Soup. Strain 1 quart white stock into a saucepan and bring it to the boil, adding a few peppercorns tied in a piece of muslin. When it reaches boiling point, sprinkle in 1½ dessert-spoonfuls semolina. Continue cooking until the latter is soft, then draw the pan to the side of the stove, allowing the soup to cool a little.

Beat up the yolk of an egg, mix it with ½ pint cream, and then strain it into the soup, stirring the whole until the egg is cooked. The peppercorns may then be taken out, a little salt added, and the soup served, accompanied by dried croûtons. See Blancmange, Croûton.

Sempervivum. See Houseleek.

SENECIO. This is the name of a group of annual and perennial plants, some of which are valuable in the garden while others are weeds. The most familiar of the latter is the familiar groundsel. *Senecio (Jacobinea) elegans* is a very pretty annual which may be sown under glass in March, the seedlings being planted out in May or potted for summer decoration in the greenhouse. Or seeds can be sown out of doors in April where the plants are to bloom in summer.

The daisy-like flowers are of many bright colours, carmine, crimson, purple, etc., and the plants, which grow about 18 in. high, last long in beauty. *Senecio multibracteatus* is a showy greenhouse perennial, 18-24 in. high, with rose-coloured blooms. Of the hardy perennial senecios the best are pulcher, 2 ft., reddish purple, which is suitable for the herbaceous border, and elvorum, *Wilsonianus* and *tangutica*, vigorous, rather coarse-looking plants, 4 ft. high, with large bunches of yellow flowers in summer, suitable for the wild garden or waterside.

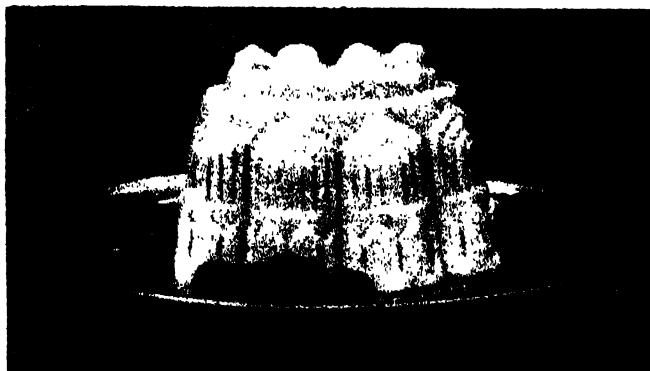
SENEGA. Preparations of the dried root of *Polygala senega* are used in medicine for their stimulating effect on the lining membrane of the bronchial tubes. Senega is usually prescribed in chronic bronchitis where the expectoration is profuse and sticky, but is contra-indicated in acute bronchitis.

SENNA. The dried leaves of the senna plant are largely used in medicine on account of their mild purgative action. Common preparations and the dose of each are:

Confection of senna, 60 to 120 gr.
Compound mixture of senna, or black draught, 1 to 2 fluid oz.
Compound liquorice powder (containing senna), 60 to 120 gr.

Senna is commonly used for habitual slight constipation. The compound liquorice powder, which owes most of its purgative effect to its contained senna, is a common household remedy. See Aperient; Constipation.

SENSITIVE PLANT. This name is given to *Mimosa pudica*, the leaves of which close together when they are touched by hand. This is a hothouse perennial plant and flourishes



Semolina Blancmange, a delicious and decorative party sweet

in sandy soil in a sunny part of the house. It is often treated as an annual and grown from seeds sown in spring.

SENSITIVITY: In Wireless. This is the ability of a receiver to respond to weak transmissions. A set which gives loud signals when tuned to a very weak distant transmission is said to possess good sensitivity, whereas a receiver which gives weak signals when tuned to a very powerful nearby transmission possesses bad sensitivity.

A set designed for high sensitivity normally incorporates one or more high-frequency amplifying stages.

SEPARATION: Of Husband and Wife. A husband is bound to support his wife in his home and a wife is bound to live with her husband. If the parties wish to put an end to these marriage obligations without putting an end to the marriage itself by a divorce, or if one of them has behaved in such a way that the other is entitled to refuse to live with him or her, they may either (1) enter into a separation agreement, (2) obtain a decree of judicial separation, or (3) obtain a separation order from a court of summary jurisdiction.

Separation Agreement. By this the parties agree to live apart and not to interfere with one another, and the husband provides for the support of the wife and any children. The wife agrees not to make her husband liable for her future debts. The agreement must be made in contemplation of an immediate separation, and if a husband and wife who are still cohabiting enter into a deed whereby the husband promises that if at any future time the wife shall separate from him he will make her such and such an allowance, the agreement is bad. Immediately after the agreement the parties must cease to reside together, and merely ceasing to cohabit is not enough. If after a separation spouses decide to live together again they enter into a deed of reconciliation, and in this they may make provision for the possibility of their again being separated. A separation agreement is put an end to by the resumption of cohabitation between the parties. In cases where spouses have agreed to separate, neither can complain of desertion.

Judicial Separation. Whereas a separation agreement may be entered into at the will of the parties and without any special cause, a judicial separation is a decree of the High Court and can be obtained on proof of (1) desertion for two years; (2) any ground for a divorce; or (3) failure to obey a decree for restitution of conjugal rights.

Cruelty may be mental as well as physical. Desertion occurs when one spouse refuses to live with the other without some reasonable cause, such as the exigencies of business. If one spouse deserts the other, a decree for restitution of conjugal rights may be obtained at once, and, if not obeyed, the other spouse may obtain a judicial separation without waiting two years. The court may also make orders for the custody of any children and for the payment of alimony to the wife. This is usually such sum as will make the wife's income equal to one third of the joint income of husband and wife. Thus, where the husband's income is £1,000 and the wife's £200, alimony from the husband would be £200, making the wife's income £400 in all.

Separation Order. A married woman may apply to a magistrate's court for a separation order (1) if her husband has been convicted of an aggravated assault upon her or has been convicted upon indictment of any assault upon her and sentenced to a fine of more than £5 or imprisonment exceeding two months, (2) if her husband has deserted her or has been guilty of persistent cruelty or wilful neglect to provide for her or her children. Either husband or wife may obtain an order if the

other has committed adultery or is known to be an habitual drunkard.

The separation order may make all or any of the following provisions: that the husband (or wife) shall no longer be bound to cohabit; some provision for the legal custody of any children (this does not include illegitimate children); that the husband shall pay a weekly sum not exceeding £2 for the maintenance of the wife and a sum not exceeding 10s. a week for each child. Before the husband can be ordered to pay anything, there must be evidence that he has means, or is able to earn more than sufficient money for his own maintenance. The wife's means are also taken into account. If any change takes place in the means of either of the parties after the order, the husband may apply to have the amount reduced or the wife to have it increased, as the case may be.

A husband deserts his wife either if he leaves her or if he shuts her out of his house. A woman who has been guilty of adultery cannot obtain a separation order, and if a woman commits adultery after an order has been obtained, the order for the allowance cannot be enforced. The separation order is not enforceable while husband and wife are residing together, and the order comes to an end if they continue to reside together for three months after it is made or if they resume cohabitation. Neither a separation agreement, a judicial separation, nor a separation order puts an end to the marriage.

Separation Allowance. This term is used in two distinct senses. In one it is the allowance that a husband makes to a wife on their separation. It may be quite voluntary, but it is often the result of legal proceedings and is linked with a separation order. When an order of this kind is made the husband is usually ordered by the court to pay a certain sum towards maintaining his wife.

This amount varies according to circumstances the man, but not the only consideration, being the means of the husband. A weekly wage earner will be ordered to make a weekly payment, while a richer man is ordered to allow his wife a larger sum of so much a year. The court, in fixing the sum, will take into account the wife's habitual standard of living and also any income which she may possess in her own right.

The maintenance of the children, in cases where there are children, is a very important matter in fixing a separation allowance. If the wife is to bring up and educate young children she will obviously be granted a larger allowance than if she is not. The court may fix a distinct amount for a child or for the children which the husband must pay, this being in addition to the separation allowance made to the wife.

Allowances in the Fighting Services. In the other sense, a separation allowance is the money paid by the state to the wives and dependants of soldiers, sailors, and airmen on active service. These allowances are very numerous and prominent in time of war, but there are, normally, comparatively few of them in time of peace. The amounts are altered from time to time according to variations in the cost of living, and other matters.

Such a separation payment takes the form of an allowance of so much a week for a wife, and so much for each child. A certain amount of the allowance is deducted from the man's pay, out of which he can, if he wishes, add to the allowance. Allowances to father, mother, and other relatives are made only if they are dependent, either wholly or partially, upon the service-man concerned. See Allowance.

SEPARATOR: For Milk. This is a dairy appliance used for separating the cream from new milk. The principle upon which most of these instruments work is that of centrifugal force. The milk is led into a chamber where disks of tin or similar metal are caused to rotate at high speed. This churns up the milk and causes watery ingredients to be thrown out to the outside of the bowl, while the cream rotates near the central axis of the disks. By various forms of mechanism the cream and what is known as the skim milk are separated and led off through different channels to separate collecting vessels. A small type is manufactured as a hand-power machine, but other kinds are available which are driven by electricity, thus giving a more regular rotation of the disks, with consequent better separating effect.

SEPTEMBER

What to do in the Garden

<p>Flowers Plant hyacinth, daffodil and other spring-flowering bulbs in bowls of clay indoors. Plant spring-flowering bulbs in pots of sandy loamy soil, put them out of doors and cover with old sifted ashes for 6 weeks. Transplant container and other choice evergreen shrubs. Prune rambler roses by cutting out old stems and tying in the new shoots. Plant bulbs of daffodil, crocus, snowdrop and Spanish and English lilies. Clip evergreen hedges for the last time before winter. Take cuttings of summer bedding plants and insert in pots or boxes of sandy soil in a frame. Place pot-grown chrysanthemums under glass so that the blooms may develop perfectly. Insert cuttings of roses, lavender, rosemary and other shrubs in sandy soil in a frame. Pot bulbs of crocus and bulbous for spring-flowering under glass. Sow sweet peas out of doors if the soil is light, otherwise in pots or boxes. Plant violets in a frame to provide winter flowers.</p>	<p>Place goosebans on the stems of fruit trees to trap wingless female moths. Prune raspberry and black currant bushes. Plant a new strawberry bed. Remove diseased leaves from old strawberry plants. Insert cuttings of roses, lavender, rosemary and other shrubs in sandy soil in a frame. Pot bulbs of crocus and bulbous for spring-flowering under glass. Sow sweet peas out of doors if the soil is light, otherwise in pots or boxes. Plant violets in a frame to provide winter flowers.</p>	<p>Vegetables Plant spring cabbage. Pot cauliflower plants and keep them in a frame for the winter. Lift and store late potatoes. Lift and store onions. Select "seed" potatoes for planting in spring and store in a cool place. Earth up celery and leeks.</p>
<p>Fruit Gather apples and pears which are ready for eating in October. Take cuttings of sum-</p>	<p>Food in Season</p>	<p>Fruit Apple; apricot; banana; blackberries; bilberries; cherries (morella); cranberries; damsons; figs; grapes; greenage; medlars; melons; mulberries; nectarine; orange; peach; pineapple; plum; quinces; nuts (various)</p>

Food in Season

<p>Fish Bream; brill; eels; flounder; grey mullet; gurnet; haddock; hake; halibut; herring; lemon sole; perch; plaice; red mullet; salmon; skate; sole; trout; turbot; whiting.</p> <p>Shellfish Crab; crayfish; lobster; mussels; oysters; prawns; scallops; shrimp.</p> <p>Meat Beef; lamb; mutton; pork; veal; venison.</p>	<p>Poultry and Game Black game; capercaillie; capons; chicken; ducks (wild and tame); fowls; geese; grouse; hares; larks; leverets; moor-game; partridges; pigeons; plover; pullets; rabbits; snipe; turkey; turkey poult; teal; wildgeese; woodcock.</p> <p>Vegetables Artichokes (globe); asparagus; beans; beetroot; broccoli; cabbage; carrots; cauliflower; celery; cress; cucumber; endive.</p>	<p>hormedahl; leeks; lettuce; mushrooms; onions; parsnip; peas; potato; red cabbage; spinach; sprouts; turnips; vegetable marrow; watercress.</p>
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Notes for the Month

SEPT. 1.—Partridge shooting begins.
SEPT. 29.—Quarter Day.

Septicaemia. See Blood Poisoning.

SEPTIC TANK. A septic tank is employed in a particular process of sewage purification. It is used in certain towns, also in institutions and large houses in the country, as a considerable amount of land is needed for the treatment of the liquid passing out of the tank. The tank makes use of certain germs which split up and liquefy the solids that are suspended in sewage.

The tank is merely a chamber dug out of the ground and lined with brickwork, several feet in depth and roofed in, and of such a size that it takes the sewage 12 to 24 hours to pass through it. In some of these tanks there is no roof but in either case the inlet and outlet pipes open below the surface of the sewage. A thick scum forms on the surface of the sewage and this helps the germs by keeping them warm and protecting them from the air. Gases are produced which are highly inflammable, and these gases are sometimes collected and used as fuel.

After passing through the tank, a considerable amount of the solids in the sewage have been digested. The sewage is purer but, nevertheless, so black and offensive that further treatment is necessary by filtering through chalk or coke, or, in some cases, by distributing the sewage over a tract of land and allowing it to percolate through the soil. Some solid matter settles on the bottom of the tank and has to be drawn away every twelve months or so. Disinfectants, in any amount, added to the sewage prevent the septic tank from working properly.

Owing to the nuisance from smell, these tanks should be placed at an adequate distance from a house. They are satisfactory in their results but require careful and skilled supervision, and are of no value for small domestic establishments.

The Semi-septic Tank. This is a variation of the septic tank, for in this type the work of purification is not completed in the tank itself, and only the primary process of disintegration goes on there. The breaking down

of the solids is only partly carried out and so the semi-septic tank is made on the small size, so that the partially treated sewage passes out to another stage for treatment. In this class of tank, therefore, the sewage is settled and partial liquefaction of the suspended matter takes place, besides the equalization in the strength of the sewage by its brief stay in the tank.

The second stage is to pass this effluent out for oxidation. This is accomplished in several ways. If there is plenty of suitable land available, it can be fed on the land, but the commonest way is treatment in one of the many forms of contact or filter beds now in use. These consist of a variety of materials of an indestructible nature. The essential feature is plenty of surface area to ensure the growth of bacteria. Probably the commonest material is a hard drinker, gauge one to three inches. For small systems one contact bed may be found sufficient, but in the large sewerage bed are used. See Cesspool; Sanitation.

SERGE: The Dress Material. Most serges are inclined to become shiny after long wear, and, on the whole, those which feel hardest to the touch take on a polish first. Serges such as chevots, with a short nap or fibre on the surface usually do not shine until the nap has worn away, but the wearing-off of the fluff lends a threadbare appearance.

Botany serge is fine, soft, and warm, and the best cloths of the sort show a neat and even twill. Serge shrinks less than flannel, and if white serge is washed and dried with care and bleached occasionally, it will be prevented from turning a dingy yellow. It is a useful material for sports wear and for children's coats, etc.

SERPENTINE LINE. In furniture this is a line used in design. The front of the piece is convex in the centre, whence it sweeps in wave-like form towards the wings, which become concave. It was much used by Hepplewhite for sideboards, dressing tables, etc. See Fender; Sideboard.

SERVANTS AND THEIR DUTIES

Hints Towards Comfort and Contentment for Employer and Employed

Shorter entries, e.g. Butler, Chauffeur, Kitchenmaid, Nurse, Parlourmaid, deal with the various duties of various classes of servants. See also Character; Employers' Liability; Housekeeping; Insurance; Kitchen.

When servants are engaged through the medium of advertisements or a registry office, or in any other way, a personal interview should be arranged if possible. The smaller the household the more the mistress and servant or servants come in contact, and personality must count if the best results are to be obtained. It is also important for servants to see the style of the house or flat. Should a servant have come from a larger establishment, he or she may show at once that the new place will not suit; if from a smaller one, the mistress may feel that too much training will be required before the servant is up to the standard of the home and of the other servants kept.

After a satisfactory interview it is well to arrange for a personal reference. If the employer who is parting with the servant will give this, a better idea of the work and character is obtained both by the answers of the employer to the questions, which should be clearly thought out beforehand, so that nothing essential is missed, and by the aspect of the house. If a personal reference is unobtainable, it is never wise to accept from the servant a written reference. The late employer should be asked for a direct character, and this will be a better guide as to the servant's suitability for the new place.

Outdoor servants are almost entirely men, the two largest classes being gardeners and

chauffeurs. They live in their own houses, or sometimes in houses on the estate of their employer, and, like other workers, receive a weekly wage. With domestic servants may be classed charwomen, jobbing gardeners, and others who work for more than one employer, doing a day's work here and there. They are paid so much a day.

Men servants classed as indoor servants are not very numerous. In larger houses a butler and perhaps one or two footmen are kept, and in some cases a valet. Men servants, like the women, receive board and lodging as part of their pay. A licence is not now required for a manservant.

Where only one maid is kept she is known as a general servant. Two maids usually divide the duties of cook and house-parlour maid. Bigger households may have, in addition, a parlourmaid, between maid, kitchen-maid, and scullery maid. A housekeeper may superintend the other women servants, and there may be a lady's maid.

Nurses and under-nurses are kept in houses where there are children. In the larger houses their duties are strictly confined to looking after the children, but in the smaller ones a nurse-housemaid may be kept to do the work of a housemaid as well.

While it is impossible to keep to a hard and fast set of rules, a certain number are essential to order and comfort. If more than

one servant is kept it is important to assign duties at the outset with even more decision than in the case of one experienced maid, who may be allowed to have some views of her own.

If a servant is to be put on board wages when the family go on holiday, this should be explained to her. The term board wages means the servant's ordinary rate of pay plus an allowance for food, and also for lodging if the house is shut up, the amount varying according to circumstances. When the maid accompanies the family, the question of board wages does not arise, but there may be friction if servants find themselves treated in this way without having been informed of it when they came.

Another matter to be decided when engaging a servant is whether her friends shall be allowed to visit her. This is a question that must be settled in every case in accordance with individual wishes.

Comfort Essential to Good Work

Good or bad servants can make or mar the home. They should be well treated and, if good, their work should be respected and appreciated, and a real interest taken in them. Perhaps the most frequent causes of complaint are uncomfortable bedrooms, badly furnished, more than one maid in a small room or more than two in any room, insufficient or poor quality of food, and the matter of outings. In newer houses a small sitting-room or recess off the kitchen makes for comfort.

It is impossible to expect good work from anyone who cannot sleep in comfort. If the house is too small to accommodate the desired number of servants, it is best to have daily help.

Good food, without waste, is essential. The mistress should retain complete control of the larder and, unless she has an experienced cook, herself solve the problem of left-overs so that they shall not be wasted or eaten under protest in the kitchen. Where a servant asks for some special inexpensive article of diet, it should be provided for her.

Outings. In this matter hard and fast rules cannot be laid down. One afternoon and evening a week and every second Sunday afternoon and evening are the usual minimum. The hour of return in some places is fixed at 10 p.m. With a young servant this hour should be late enough, but if permission be occasionally asked to go to a theatre or other entertainment, it should not be withheld without good reason. Where there are several maids it may be difficult to arrange extra outings for all, and favouritism should be avoided.

In the case of the general servant, if she gets through her work, she should be encouraged to have as much time as possible to herself. In a small family an only servant is often lonely, and the kind and sensible thing to do is to allow her to invite a friend or relative to the house. A special sitting-room is not possible in the small house, but if the kitchen cannot be comfortable, owing to its size, it can sometimes be arranged for her to use the dining room after the evening meal. A good servant commands and is worth, high wages. When a maid is young and inexperienced a mistress must expect tactfully to train her if the home is to be well run.

Where three servants or more can be kept their work is so clearly defined in the kitchen, sitting-rooms, and bedrooms that a well organized household becomes a simpler matter than where all the duties have to be performed by a cook-general and house-parlourmaid, or a general alone. Where only two maids are kept, it is essential that they should get on well together, and that any housework which the cook is expected to do should be clearly understood on engagement. It is usual for her to be responsible for cleaning the

dining room, breakfast room, should there be one, hall and steps. Sometimes she takes in the breakfast, and usually clears it away and washes up while the house parlourmaid is busy in the bedrooms.

The cook assists in making the beds, and after that her duties are confined to the kitchen, except on the occasions when the other maid is out. The house parlourmaid combines the duties of parlourmaid with that of housemaid, and should be dressed for luncheon. A simple dinner is usually arranged, with which she can cope, on the days when the cook is out. Where there are children a nurse housemaid is sometimes kept as the second servant and the parlourmaid side of her duties require to be simplified.

Some people solve the two servant question by engaging a husband and wife. They may both be trained servants, in which case the woman acts as cook-housekeeper and the man undertakes the duties of butler. When engaging a husband and wife the highest personal references are advisable, as it is a more serious matter if they have to be dismissed than is the case when a single servant proves a failure.

Maid's Uniform. The question of uniform sometimes presents difficulties, especially in the case of the general servant. Should she object to uniform she can usually be persuaded to wear an overall in the morning with a coarse apron for rougher work, and a dark dress in the afternoon with machine apron, collar and cuffs. Very often if the mistress helps with the purchase of a smart uniform any difficulty in getting it worn is overcome.

Where a parlourmaid and housemaid are kept some mistresses like to provide the afternoon uniform so that both maids, if required to wait at table, or to assist in pouring out the tea at an "at home," present an attractive appearance. Black dresses need not necessarily be worn, brown, blue, claret colour or bottle green are sometimes preferred, with a pretty style of cap, apron, cuffs, and collar. In the morning parlourmaids and housemaids wear cotton dresses. Small patterns are more useful than plain colours. The house parlourmaid should wear a clean apron under her coarser one, so that the latter can be quickly taken off should she have to answer the door or a sitting-room bell in the morning. A rubber apron is a convenience to protect the maid's afternoon uniform when washing up. Neat shoes are important.

Cooks wear dresses with short skirts and either large linen aprons or overalls in the kitchen. Caps are optional. Where there are stone floors to kitchen and scullery boots are more comfortable than shoes.

Where one manservant is kept he does not wear livery. Black coat and dark trousers is the customary uniform. In many houses where no regular servant is kept, the housewife is relieved of the more laborious domestic duties by hiring the services of a daily girl. She may be engaged for the whole day, in which case she will probably wear uniform in the afternoon, or for the forenoon only, or for a couple of hours, according to requirements. Her wages are paid weekly and she may get her meals or not, as agreed upon.

Insurance. One of the duties of an employer is to see that his or her servants are insured under the national insurance scheme and that the cards are regularly stamped. Domestic servants whether full time or part time come within the scheme except in certain special circumstances. It is desirable to insure them against any accident that may happen to them in the course of their employment. The best way of doing this is to take out a combined insurance policy which covers risk from fire and burglary and also insures the servants against accident.

SERVICE HATCH. As a general rule a service hatch is an opening about 2 ft. square provided with a door or doors, forming a means of direct communication from the dining room to the adjoining kitchen or pantry. It is particularly helpful in a house or flat, to facilitate the service of meals and to save



Service Hatch in which one set of doors closes automatically as the other set opens

much walking to and fro. In winter, hot dishes have a better chance of reaching table in that desirable condition, in contrast to the cooling delay occasioned by a walk along a (perhaps draughty) corridor with them.

In most instances the service hatch consists simply of a door, which can be hinged, or arranged to slide sideways or upward in grooves. The sides of the hatch are generally lined with wood, in the same manner as a door or window opening, and are also provided with a wide window board or shelf.

To prevent odours from coming through from the kitchen two doors or two sets of double doors can be provided, and the hatch made a couple of feet deeper. One set of doors will be hung on the dining room side of the wall, and the other on the kitchen side. The articles as they are prepared for table are placed in the hatch, and the doors closed on the kitchen side. Those on the dining room side are then opened whenever the articles are needed, and the dirty plates replaced, the doors being closed afterwards on the dining room side.

In regard to the hatch illustrated, one set of doors is automatically closed when the other is opened and no view through into kitchen or dining room is obtainable. No noise, sounds of talking, or smell of cooking can penetrate. Hatches are sometimes arranged to open above built-in dressers, or form portions of the backs of sideboards. See Dining Room, Kitchen, Pantry.

SERVICE LIFT. In houses with a basement kitchen the installation of a service lift saves the labour of carrying trays up and downstairs and also prevents food from getting cold during the transit from kitchen to dining room table. Before proceeding with plans for installation inquiries should be made to ascertain if there are any landlord's restrictions that preclude it. In some cases the local authority has requirements which must be met.

When the dining room is immediately over the kitchen the lift can be planned to rise in a corner of the room. Sometimes such a lift is of the disappearing type and is operated from

below ascending through a hole in the floor. When the cage descends the floor boards on top return to their usual position. In other cases a built-in cabinet conceals the lift.

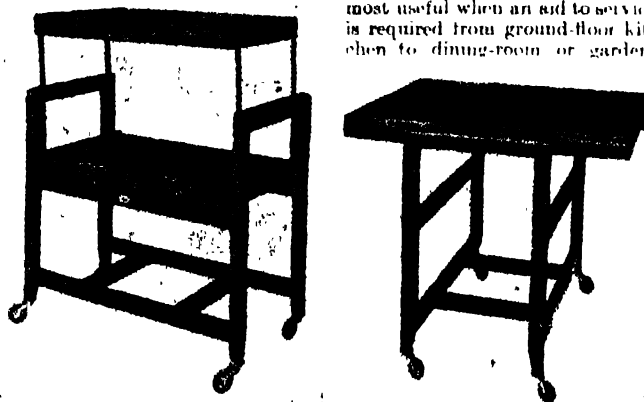
A service lift can be operated by electricity or by hand power. In the former case it can be worked from either the upper or lower floor. In the latter case the hauling rope must be adjusted so that it is not loose enough to rattle against the casing, or too tight so that it grates. If a self-sustaining gear is used, the cage is locked into position as soon as either the winding handle or the hauling rope is released. The lift may be fitted with a brake worked by a foot pedal, in this case the lift is moved when the foot presses the pedal and the brake comes into operation when the foot is removed. See Dining Room.

SERVICE PIPE. This name is given to a pipe conducting the principal supply of water or gas to a building, made of lead or galvanized iron, respectively. Generally there is a stop cock in the run of the water service pipe in any convenient position, in or just outside the building, so that the water can be entirely cut off if necessary. A draw off cock should be placed on the house side of the stop cock so that the entire system can be drained.

In the case of the gas service pipe, this is usually the property of the gas supply company, and runs from the gas main to the gas meter. See Gas, Pipe, Water Supply.

SERVICE WAGON. Known also as dinner wagons, service trolleys, tea wagons and table wagons, service wagons may be obtained in oak, walnut or mahogany, and also in enameled or plain white wood for nursery use. They are made with two or three tiers or trays, and in some cases are so constructed as to be readily convertible into tables.

The small two-tiered kind is most useful when an aid to service is required from ground-floor kitchen to dining-room or garden.



Service Wagon. Two views of a two-tiered wagon which can be laid in the kitchen, wheeled into the dining room and there converted into a rigid table

and obviates the carrying of heavy trays. As such a wagon is table height it can be arranged and laid as an afternoon tea table, cakes, etc., being placed on the lower tier.

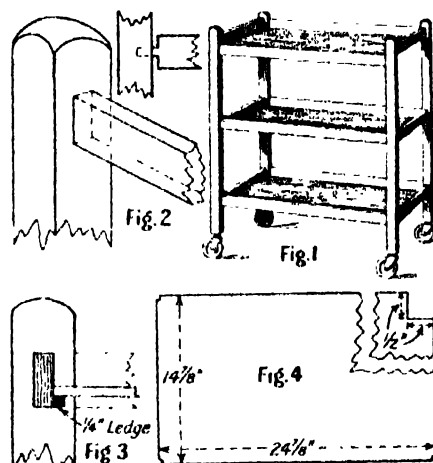
The wagon illustrated can be converted into a rigid table at which four people can be seated for luncheon or dinner. Slight pull on a small button enables anyone instantly to change the wagon while loaded into a table or vice-versa. When laid in the kitchen, the table is converted into the wagon shown on the left, wheeled into the garden or dining room, and converted into the table shown on the right. The cellulose finish resists damage to heat, if hot liquids are spilt and removed at once they will not stain the surface. Wagons with three tiers are obtainable, which swing into position and form a table at which six people can sit.

Making a Trolley. The simplicity of this dinner or service wagon, made throughout in oak, commends it immediately. The overall height is 31 in., length 26 in., and width 16 in., 2 in. of the total height being accounted for

by the rubber-covered castors screwed to the four uprights. The uprights are of 1½-in. square wood, the fronts, backs, and sides of the trays or shelves being 1½ in. by ½ in. thick. The shelves or tray-bottoms are of 5-ply oak, each 24½ in. long by 14½ in. wide.

Dowel joints are used throughout. The three tray-fronts are first dowelled and glued to the front uprights, the bottom tray-front being 4 in. up from the bottom, the middle one 12 in. higher, and the top one 12 in. above that. Proceed in exactly the same manner with the back. When the glue has set perfectly, join front and back together as shown at Fig. 1, the jointing being shown in detail at Fig. 2.

The 5-ply shelves or tray-bottoms (Fig. 4) rest and are glued upon ½-in. square strips of oak glued to the inside lower edge of each tray-front and side back (Fig. 3), the tray-bottoms being notched out at each corner to



Service Wagon. Fig. 1. Wagon made in oak. Fig. 2. Detail of jointing. Figs. 3 and 4. Tray bottom and method of attachment.

ensure a neat fit. Fitting the rubber-covered castors completes the wagon, which may be polished or left in its natural colour. See Dining Room, Dowel.

Serviette. See Napkin.

SETSCREW. This name is given to a small, usually headless screw used to affix one part to another. Setscrews are employed for fixing a small pulley or gearwheel to a shaft, a knob to a spindle and for like purposes. As the name suggests, the screw is used to set or fix the position of a movable part on another part.

SET SQUARE. This name is applied to an instrument used for testing or marking out rectangles. Carpenters and engineers use squares when working in wood and metal, but the term set square is more correctly limited to the squares used by draughtsmen. In a simple form it may consist of a thin, flat piece of pear wood triangular in shape. Two of the sides form a right angle, and the third is at an angle of 45° or 60° to one of the other sides.

In almost all cases it is necessary that one of the edges of the instrument should rest upon a T-square or batten, which is set in position parallel with the base line or principal horizontal line. By sliding the set square along the batten or T to the desired spot and drawing a line against the edge of the square, the angle formed between this line and the horizontal or base line will be 90°.

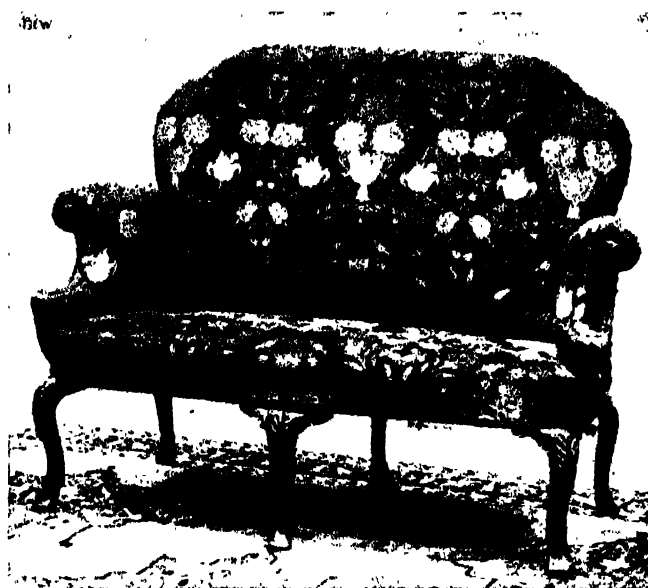
As a test for accuracy of the square portion of the instrument, turn the square over without moving the batten. If the square is correct, a second line drawn from the same point as the first will exactly coincide; but if the square is incorrect, the lines will be

lapped, and the amount of taper at the extremity of the square will be the amount of error in the instrument.

Squares should always be kept clean and in a dry place, preferably hung up on the wall. Celluloid or ivory set squares are best cleaned by washing them in soap and water. Wooden squares may be cleaned with a linen rag moistened with petrol, and then polished. See Drawing, Measurement, Rule, T-Square.

SETTEE. The settee is a long seat, usually upholstered, and having arms at either end. It differs from the sofa, being rather a development of the settee. It appeared in England about the end of the 17th century, and some splendid pieces, notable for their upholstery, were made at that time. The example illustrated is in walnut, with six cabriole legs, and high backed seat covered in beautiful brocade silk. Later the upholstery was left out from the back and sides, and the settee became in effect two or three chairs with a single back.

Chippendale designed settees with open backs, carved with ribbon work and C scrolls. Chinese frots occasionally form the backs, and the square legs are connected by rails.



Settee. Queen Anne walnut settee with silk brocade covering. Courtesy of M. Harris & Sons.

Hepplewhite became famous owing to his wheel-back settees, made of satinwood and painted. In general his settees have the crest rail in the form of a wave that flows gently into the arms at either end. The fully upholstered ones have in some cases no wood showing on back and seat, but in others a neatly moulded frame is visible all round. The legs are often round and straight, but cabriole legs are sometimes found.

The chair-back settee was favoured by designers of Regency furniture. See Chair, Hepplewhite, Queen Anne Style; Regency Style.

THE SETTEE BED AND ITS CONSTRUCTION

A Convenient Piece of Furniture for the Flat or Small House

This construction describes the making of an article that will serve as a seat by day and as a bed by night. To make it, the amateur needs a knowledge of the various processes that are described under such entries as: Dovetail; Joint; Mortise. See also Chair; Chair Bed; Divan; Upholstery.

A settee bed, as it is called, is a piece of furniture that will serve as a settee during the day and as a bed during the night. Such beds have to a great extent been replaced by divans, but are suitable for bungalows and bed-sitting rooms. There is only one main type of settee bed, but they are made in various sizes and patterns, and in various materials and qualities of material.

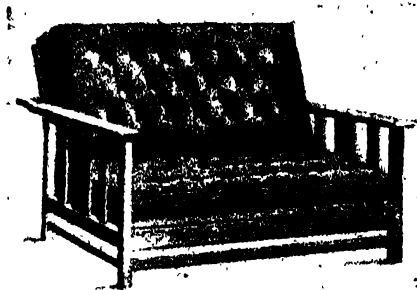
The settee bed shown in Fig. 4 will be found comfortable and inviting, and the extra cushion shown at the back can be transferred to the seat for those who prefer it. As a bed the appearance of the settee will be as in Fig. 2, the opening out being of the simplest description and speedily effected. The main dimensions, excluding cushions, are: height of seat over framings, 9 in.; height of arms, 1 ft. 11½ in.; height of back framing from ground, when vertical, 3 ft.; length of seat over upright, 4 ft. 2 in.; length over arms, 4 ft. 4 in.; width of sides over uprights, 2 ft. 4 in.; length of arms, 2 ft. 11½ in.; length of back, seat and foot frames, 3 ft. 10 in.; width of back and seat frames, 2 ft. 3 in.; width of foot frame, 1 ft. 11 in. net; and with stop extensions as required.

Probably the best wood to select for general purposes is oak, stained to a rich nut-brown colour and bright polished. The legs or uprights (A, Fig. 4) require 4 pieces of 2 in. by 2 in., the length given in the cutting list allowing a shade for paring in finishing to include a stub tenon at the top end to enter the arm. Mortises should be cut for the seat and lower rails, and the legs may be mounted on castors,

making an allowance of 1½ in. in height when setting out the working drawing.

The arms (B) finish 3½ in. by ½ in., and have the edges slightly rounded away for comfort. When fitted in position they project

	Long ft. in.	Wide in.	Thick in.
4 legs (A)	2 0	2	2
2 arms (B)	3 0	3½	½
2 rails (C)	2 4	2½	1½
2 rails (D)	2 4	1½	1½
2 slats (E)	1 2½	1½	½ or ¾
4 uprights (F)	1 2½	2½	1½
1 front rail (G) ..	4 2	2½	1½
1 back rail	4 2	2½	1½
1 front rail (H) ..	4 2	1½	1½
1 back rail	4 2	1½	1½
BACK FRAME			
3 slats (J)	2 3	1½	1½
2 rails (K)	3 0	1½	1½
8 slats or battens (L) ..	2 1	14 or 3	1½
2 strut legs (M) ..	1 0½	1½	1½
1 strut rail	3 9	1½	1½
1 clutch (N)	2 2	1½	1½
2 bolts and nuts ..	2 3	1½	1½
1 adjustment rod ..	4 3	1½	1½
SEAT FRAME			
3 slats	2 3	1½	1½
2 rails	3 10	1½	1½
8 slats	2 1	1½	1½
FOOT FRAME			
3 slats	2 0	2	1½
2 rails	3 0	2	1½
8 slats	1 10	2	1½
2 stop fillets	2 3	2	1½
2 strut legs	1 2½	1½	1½
1 strut rail	3 9	1½	1½
1 clutch	2 0	1½	1½
2 ledges for seat frame	2 0	1½	1½



1 in. on the outer side and $\frac{1}{2}$ in. on the inner, and 1 in. in front, which would allow $6\frac{1}{2}$ in. net for adjustment projection of the arm at the back when finished. Just behind the back upright the arm is reduced to $2\frac{1}{2}$ in., as in Fig. 6.

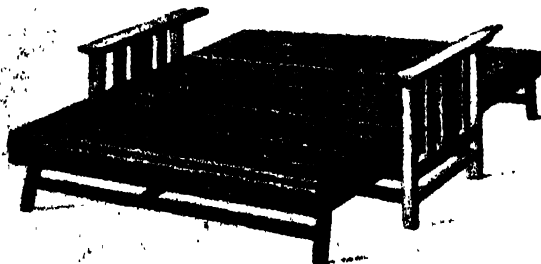
The seat rail (C) takes two pieces to finish $2\frac{1}{2}$ in. by $\frac{1}{2}$ in., tenoned or dowelled to the legs, and similar rails (G, Fig. 3) are fitted to the legs at the same level front and back. A stretcher rail running between the front and back rails may be dovetailed in if desired. The underframing rails (D) and corresponding rails (H, Fig. 3) fitted to the sides and front respectively may finish $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. net.

The panels (E, Fig. 4) between the arms and seat rails have a visible height of 13 $\frac{1}{2}$ in., and are fitted into position with $\frac{1}{2}$ in. stub tenons top and bottom, the net finished width being $4\frac{1}{2}$ in., using $\frac{1}{2}$ in. or $\frac{3}{4}$ in. thickness as preferred. The parallel effect can be of applied mould gluing and pinned on. If this main framing is carefully put together a substantial and lasting result will be obtained. The separate framings for the back seat and foot ends forming the cushion rests may next be dealt with, and a nicely smoothed finish with the edges slightly rounded away will give the best effect.

Reference to Fig. 5 shows that the whole back frame is hinged to the back edge of the seat frame, and supported at a convenient angle by an adjustment rod behind in the slotted arm, as in Fig. 6. Two outer stiles (J) and one centre stile will be required to finish $1\frac{1}{2}$ in. by $\frac{1}{2}$ in., and also 2 rails (K) to finish 3 ft. 10 in. by $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. This allows for jointing and clearance between the arms so that the framing may fold down between for portability. The stiles and rails should be mortised and tenoned together and pinned. The slats or laths (L) may be anything between

$1\frac{1}{2}$ in. and 3 in. wide, and finish $\frac{3}{4}$ in. thick stubbed into the top and bottom rails and equally spaced.

This should result in a firm but light rectilinear framing, when lowered to seat level it will be supported by strut feet which fold between the inner edges of the stiles in the manner indicated at Fig. 7. These strut supports (M, Figs. 5 and 7) take 2 pieces of hardwood $12\frac{1}{2}$ in. by $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. and are bolted right through J and M with $\frac{1}{2}$ in. round-headed bolts. The heads are sunk and the bolts are nutted on the inside so that they



Settee Bed. Figs. 1 and 2. Useful piece of sitting-room furniture which can be unfolded and used as a bed in an emergency.

pivot freely without play. A section at O (Fig. 5) shows how the bolt is entered.

The stretcher rail between may be of the same substance as the legs, tenoned and pinned in. When the strut support is lowered and bearing the frame it is held in position by means of a clutch (N, Figs. 5 and 7) which is of $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. or $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. thickness in the length and with a $1\frac{1}{2}$ in. projection at the extremity to pass over the stretcher rail of the strut and grip it. This clutch is hinged to the lower rail of the framing and is of a length to butt closely between the rails. The position, approximately, for bolting the strut to the framing will leave a space between the framing and the top of the strut leg of $2\frac{1}{2}$ in., or $4\frac{1}{2}$ in. from the outer edge of the framing; this indicates a position which should be suitable for allowing the clutch to overlap and grip the strut rail.

The seat frame is of the same dimensions as the back. It may be made with 3 in. by $\frac{1}{2}$ in. laths, which will be sufficiently thick to give a bearing, whilst wide enough to be comfortable. Seven laths are indicated in the illustration, and the centre and thicker stile is omitted, but the finished effect of the whole will be better if the frame is fitted with an equal number of laths to the back frame, with an extra one to replace the centre stile.

The foot-end frame itself is 1 ft. 11 in. wide only, but otherwise it is put together with stiles, rails and laths in a similar manner to the back. This foot-end frame lies loosely under the seat frame, and when home is flush with the front of the seat frame.

When extended it drops into position level with the seat frame. The latter rests upon two stop-fillets 2 ft. 3 in. by $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in., screwed to the underside of the stiles (Fig. 5) and with a similar projection to that indicated for the

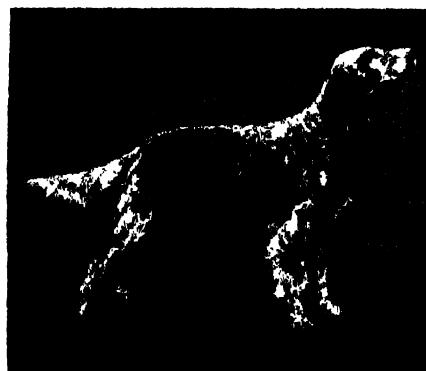
clutch, which will stop against the seat rail (G, Fig. 3) and prevent the foot frame from dropping out of position. The frame is supported by a strut and locked with a clutch similarly to the back frame. The total length of the frames when let down horizontally will thus be 6 ft. 5 in. In Fig. 7 the strut support is shown in action with the clutch indicated.

In Fig. 1 the foot-end frame is omitted to show more clearly the position of its entry. When being drawn out or pushed home it travels on fillets screwed to each of the side rails (C) in a similar manner to a drawer runner. A cutting list is given on the previous page, with the lengths slightly on the full side in most instances, to allow for finishing widths and thicknesses are net.

The Cushions Much of the comfort of a settee bed depends on the cushions, especially when they are used as mattresses. Unless they are well upholstered they will wear thin and provide little, if any, protection from the hard laths. The ordinary flock filling employed for mattresses can be used if it is properly packed in the inner casing, but as it is liable to wear hump and so become uncomfortable, the better plan is to use well curled horsehair.

The most satisfactory method of making the cushions is to use springs, and in this case they should be about 6 in. thick and fitted with 4 in. springs set at close intervals. For the amateur the best method of making them is to cut out oblong pieces of stout canvas, and sew the springs to two pieces, each spring touching the other. The sides should be fitted in with narrow material, and then each in turn covered with flock or hair to a thickness of 2 in. or so, and then with tapestry or repp. The two sides should be buttoned together so as to give rigidity and also to keep the two surfaces parallel.

SETTER: The Dog. The English setter is one of the handsomest of dogs, but, unlike the retriever, he is not greatly kept for show



Setter. Young English setter, a beautiful silky-coated sporting dog. Ralph Robinson, Redhill.

purposes. Several beautiful colours are recognized, such as black and white, lemon and white, liver and white, etc. The long silky coat is slightly wavy.

The shoulders should be well sloped, the loins wide, slightly arched and muscular, the brisket deep, and the ribs widely sprung. The legs should be strong and muscular; the feet close and compact. The head should be long and lean, the skull oval from ear to ear, allowing plenty of room for the brain. The muzzle should be moderately deep and fairly square; the nostrils wide. The neck should be rather long, muscular and lean. The tail should be carried almost on a line with the back.

The colour of the Irish setter is a rich golden chestnut, entirely devoid of black. The Gordon, or black-and-tan, is the rarest of the three. He is somewhat more strongly built than his English cousin, and his head is much heavier. See Dog; Kennel.

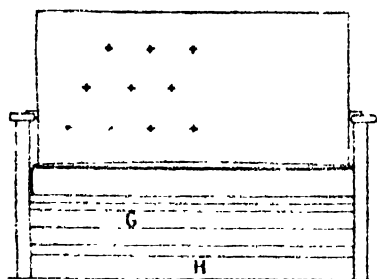


Fig. 3

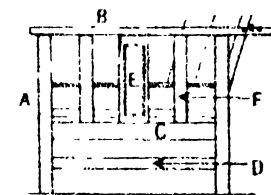


Fig. 4

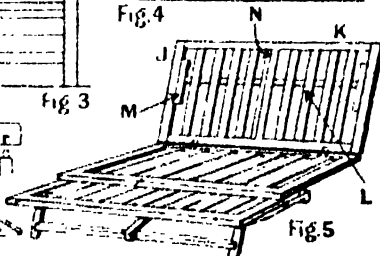


Fig. 5

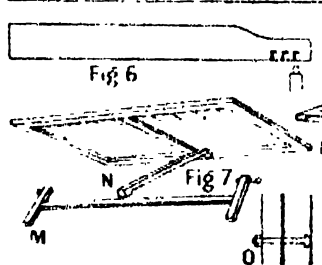


Fig. 6

Fig. 7: Front elevation of settee bed. Fig. 4: Part side view. Fig. 5: Frame-work. Fig. 6: Arm. Fig. 7: Back frame showing struts and supports.

SETTLE: ANTIQUE AND REPRODUCTION PIECES

How to Construct a Useful and Decorative Hall Seat

The reader may also consult the articles on Ingle Nook; Jacobean Style; Tudor Style; while references for the constructive side of this article of furniture include: Cabinet Making; Chest; Corner Seat; Halved Joint; Wood Carving

This word is used for a kind of wooden bench or seat. Most settles have arms and a high back and will hold three or four persons. Made of oak and heavy in style, settles appeared in England perhaps as early as the twelfth century. The high back was a protection against draughts, and some had in addition a canopy. Gradually they became more elaborate, and some examples of the Tudor and Stuart periods are beautifully carved. In some the fronts are divided into panels around which is finely

be nearer $\frac{1}{2}$ in. Two pieces are glued together for each upright, and the top curve is drawn to a radius of $7\frac{1}{2}$ in., 2 in. from the end. The curve should be reversed on one side to give a flat portion of about 2 in. The curved line is sawn with a bow-saw, and finished with a spokeshave, and the small piece cut off, as shown at B, should be placed on one side for use on the under side of the top board.

The back may be in one piece, glued up with 3 or 4 lengths and finished to 2 ft. 11 $\frac{1}{2}$ in. by 2 ft. 5 in., or formed with one 2 ft. 11 $\frac{1}{2}$ in. by 1 ft. 1 in., with a lower length, 1 ft. 5 in., of plywood. The back is fitted in a rebate cut in the upright sides, as shown. Two frames, D and E, are prepared from 2 in. by 1 in. wood (deal will do for this) to 2 ft. 10 in. by 1 ft. 1 in. The ends may be screwed or halved together, and then screwed to the sides and back. The frame, D, is flush with the bottom, and the top of E is 1 ft. 5 in. up. The top of D frame should be covered with a piece of plywood measuring the same outside size as the frame.

A length of 2 in. by 1 in. wood is fitted at the back on top of E, as indicated at F, but two end pieces, G, the same width and thickness, should be joined to it with the halving joint and project 1 in. in front, the ends being rounded as shown. A 2 ft. 10 in. by 1 ft. 5 in. frame, shown at H, is made from 2 in. by 1 in. wood, halved at the corners, and a rebate cut at the back to take a panel K, measuring 2 ft. 6 $\frac{1}{2}$ in. by 1 ft. 1 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. This framed panel should be fitted under the projections at G and screwed up from the front lengths of D and E.

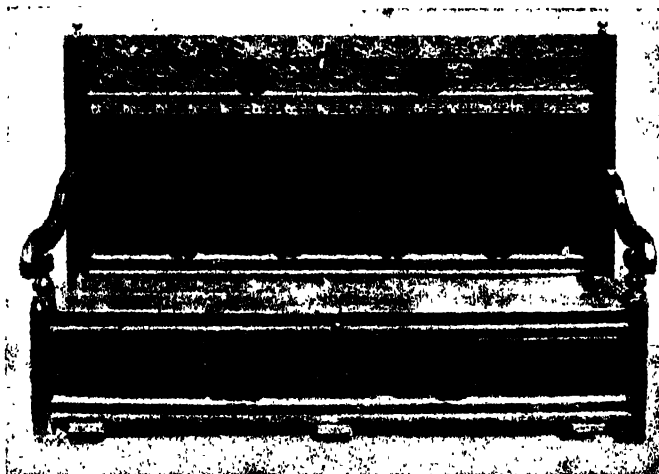
The hinged seat flap giving access to the locker at the bottom of the bench is 2 ft. 6 in. by 1 ft. 1 in. by 1 in.; the front edge is rounded and two battens of 2 in. by 1 in. wood screwed under at the ends, so as to fit inside the rail E and prevent the wood from warping. The top board, which forms a table when resting on the arms is 3 ft. 6 in. by 1 ft. 6 in. by 1 in., and is hinged 1 $\frac{1}{2}$ in. away to the back C. In order to allow the board to tilt back slightly when upright, a chamfer should be planed 1 $\frac{1}{2}$ in. wide and $\frac{1}{2}$ down at the hinge side. The pieces B, neatly cleaned with a spokeshave, are screwed to the top board, as shown.

Carving the Panels The carved decoration may be drawn direct, or on paper and transferred. The border lines, as well as the curves, are cut with a veiner and enlarged with a quick gouge as indicated at M. Slight recesses are worked with a flat gouge as shown at N, and finished as indicated at O. The tool cuts at P are done in a similar manner. The effect gained by the simple mowing of all lines with a veiner is quite effective; but, if thought too difficult, the gouge work may be omitted.

SÈVRES. The richly decorated porcelain characteristic of the famous French factory at Sèvres is rightly admired for its unique qualities of form and colour. Only the longest of purses could hope to acquire examples worth having, and the lover of antique china must usually be content to study old Sèvres in public galleries.

Started in 1756, Sèvres has always enjoyed royal or state patronage. For the first 13 years it produced soft-paste porcelain of the St. Cloud type. In 1769 a new era opened with the introduction of hard-paste, similar to that of China and Dresden. Since then practically all French porcelain has been made with china-clay and felspar and hard-paste Sèvres is therefore distinguishable from the English reproductions made in bone porcelain at Coalport and elsewhere. It now became possible to turn out enormous vases, as well

as plaques for painted scenes. During the Louis Seize period many of these plaques were set in ornate mounts on rich marquetry, and a delightful cornflower blue was introduced. The important class of biscuit figures, by great sculptors, is quite distinct from the homelier groups emanating



Beautifully carved old oak settle with box seat; 17th century
Courtesy of T. Edwards, Harrogate

executed carving. A number of settles were made in the 16th and 17th centuries, but early in the 18th the piece went out of fashion. In the 19th, reproductions of the old settles made their appearance.

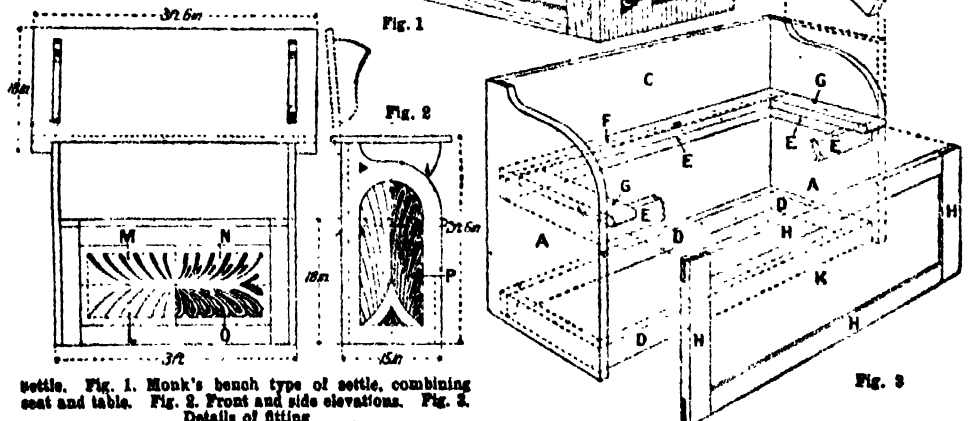
Strap work ornamentation is found on many British settles. They had inlaid chequer board decoration on the stiles and rails, and occasionally the arms were inlaid. In some, as shown in our illustration of a beautifully carved 17th century settle, the bottom of the piece was constructed as a chest.

Settles are made to-day in reproductions of the old styles, and are suitable in halls or living rooms furnished in oak period styles. Loose velvet cushions, fringed or tasselled, are permissible, but a settle is never upholstered.

Making a Monk's Bench. A type of settle with a movable back and box seat was made in Tudor and Jacobean times. The back was adjustable to form a table and the piece is often known as a monk's bench. Copied to-day for hall furnishing, this is a useful and picturesque style of seat, which combines not only a table, but also a rug chest.

The monk's bench provides suitable surfaces for incised carving. The suggestions given in Figs. 1 and 2 are taken from old English carvings, and they may be executed with a few simple tools without any previous experience of wood-carving. By the method of construction shown in Fig. 3 there are no mortise and tenon joints, the lapped halving joint only being used. Oak is the correct wood, but the carving will be easier if seasoned yellow pine is used, and finished by wax polishing only or by staining.

The upright sides, A, are 2 ft. 5 in. by 1 ft. 3 in. by 1 in. But if machine-planed wood is used, the thickness will



Settle. Fig. 1. Monk's bench type of settle, combining seat and table. Fig. 2. Front and side elevations. Fig. 3. Details of fitting



Sèvres. Left, trembleuse cup, cover and saucer, painted with medallions of children and a wreath of flowers on cover. Centre, flat-shaped gros-bleu vase and cover with white and gold scroll handles. Right, large gros-bleu cup and saucer painted with pastoral landscape and figures and with gilt scrolls and wreaths of flowers

from Dresden and Chelsea. Since the new factory was erected in 1876 there has been a revival of soft-paste porcelain, but it has not the delicacy and charm of the old Sèvres.

The mark of the double L, established in 1753 at Chantilly, with A to represent the year, was continued at Sèvres from 1756 to 1777. That year was indicated by Z, W having been omitted. The second cycle began with AA, and reached 1795 with RR, when the dating was varied for a time. Since 1818 the year has been expressed by its last two figures. From 1810 to 1848 imperfect pieces bore no mark, whereas since that date they have had a wheel-cut through the main mark. From 1854 to 1870 a crowned N stood for the emperor, and a T meant that the piece was soft paste. After 1888 the mark became a potter at the wheel, with the word Sèvres and the two figure date.

The fact that during the 19th century white biscuit pieces were freely sold has been a fruitful source of mystification. Large quantities were bought for decoration either in Paris or in England, so that the only part of them which was of genuine Sèvres origin was the body. It is estimated that of all the so-called soft-paste Sèvres in collections nineteenth century were decorated elsewhere. See China, St. Cloud Ware.

SEWAGE. This describes the refuse from a house. In towns it is carried away through the drain pipe, in connexion with which an elaborate sewage system provides for its removal and disposal. In country districts residents have often to make their own arrangements for its disposal, and one way of doing this is by means of a cesspool.

Some of the contents of sewage have a high manurial value. The processes carried out at sewage works in connexion with the water carriage systems of towns remove the greater part of this value, as neither the solid part of the treated sewage, the sludge, nor the watery effluent is of much use. Where a cesspool is used for a country house, the action of bacteria reduces the solid constituents of the sewage to a soluble condition and the liquid can be drawn out for distribution in a garden.

A cesspool should be lined with cement, otherwise the contents soak out into the surrounding soil at a depth where nitrification processes do not go on, and the sewage may make its way in the ground water and so into shallow or surface wells. In this way typhoid fever, diarrhoea, and other diseases may be propagated. Even if it has a cement lining, a cesspool should be at a lower level than a well used for drinking water, and at least 100 ft. from any well, spring, or stream.

There is much to be said for the disposal of excreta by using an earth closet and burying the contents of the pails in the upper layers of the garden soil, where nitrification will go on and thereby promote plant growth. Where such a system has been tried plentiful crops of vegetables have been obtained, and have been

consumed without causing diarrhoea, typhoid, or any other filth disease. The earth which is used in the closets should preferably be garden soil, and it is important that it should be collected on a dry day and stored in a dry place.

pests. Stop water on such a system would have to be disposed of separately, but could be utilized for watering, either by irrigation or by spraying. See Cesspool; Drains; Earth Closet; Sanitation; Septic Tank; Water Closet.

SEWING MACHINES AND THEIR CARE

How the Busy Housewife can Save Time and Money

This article describes the operation of a standard type of sewing machine, and gives hints on its correct use, together with notes on keeping a sewing machine in good working order.

The earliest type of sewing machine still used for children's machines, is that known as the chain-stitch, which uses only one thread. The machine in general use is the lock stitch. In this there are two threads, one attached to the needle and the other to a spool enclosed in a shuttle. The needle carries the thread through the material, and, in rising, causes the thread to form a loop. The shuttle passes through the loop, which, in its passage to the top of the material, carries with it the thread from the shuttle. The tension caused by the thread attached to the needle forming the next stitch pulls up the lower thread tight (Fig. 1. A).

There are two methods of moving the shuttle in general use, one being known as the reciprocating and the other as the oscillating shuttle. The former will be found on some of the older machines, and it is therefore briefly described here. In the reciprocating shuttle machine there are two shafts to convert the rotary motion from the wheel. One runs horizontally into the interior of the arm at the top of the machine, carrying at one end the heavy balance wheel, and at the other end the disk and roller for imparting the upward and downward motion to the needle-bar, together with a bevel gear wheel. The other spindle is vertical, with a similar bevel gear wheel at the top and the cam at the bottom for operating the feed lever and a balanced crank, this giving the reciprocating movement to the shuttle carrier, by means of a straight connecting rod.

The shuttle movement is at right angles to the direction of the sewing, and the shuttle slides in a shallow recess. The whole of the

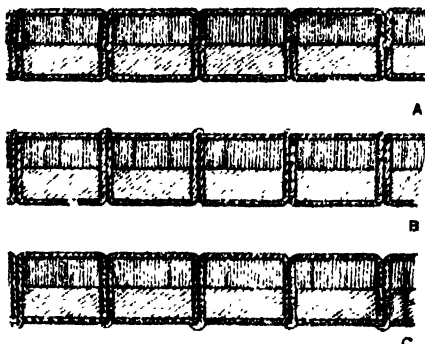
movement is directed towards obtaining an exactly corresponding movement of the needle and the shuttle, and the operation of adjusting these two disconnected parts is called timing. The timing is effected by adjusting the two bevel gear wheels, so that when the needle bar is at the bottom of its stroke the shuttle must be in such a position that it can pass through the loop formed by the thread directly the needle commences its upward stroke.

The action of the lock-stitch is assured by this adjustment, but there are other points to be considered in order to obtain a good stitch. It is necessary to have the thread in the shuttle correctly threaded and at a suitable tension, and the thread in the needle adjusted in connexion with the take-up lever, so that when the needle-bar descends it carries the lever with its attached thread and then allows it to spring upward with the ascending stroke to gather the surplus thread used to form the loop and not required for the stitch.

Leading Types. A vibrating shuttle machine is illustrated in Figs. 2, 3 and 4. In this the top spindle is formed with a crank which produces a swerving movement in the vertical lever A. This lever is connected at B to an arm C attached to the crank D of the shuttle carrier E. The feed movement is obtained through the cam at F (Fig. 2), which is attached to a crank at G (Fig. 4), operating the bar H, and imparting a backward and forward movement.

The needle-bar movement is shown at Fig. 3. The presser foot, indicated at P, presses the work down on the feed and also prevents the work being pulled up with the ascent of the needle. The pressure produced by the spring can be regulated by a screw at the top of the bar. It is lifted up by a lever at O working on the principle of an eccentric.

The internal mechanism is the same for both hand and stand machines, the only difference being in the method of turning the balance wheel. In the hand machine a gear case is attached to the framework of the machine, and contains a large-toothed wheel provided with a handle which engages with a small-toothed wheel. The latter is connected with a movable arm, which can be attached to the balance wheel and easily removed to place the handle out of action. The stand machine has a driving wheel of large diameter, turned by a connecting rod attached to a treadle. A



Sewing Machine. Fig. 1. A, stitch correctly made. B and C, stitches which result from faulty tension

belt from the driving wheel transmits the power to the pulley which forms part of the top balance wheel.

There is a type of machine in extensive use in which an oscillating hook-shaped shuttle carries the lower thread in a circular bobbin. This shuttle may work in a horizontal plane, or in a vertical one. There are several other kinds of sewing machine in use, as, for example, those having a circular container for the lower thread in the form of a rotary hook. Instead of moving backward and forward, the hook continues to revolve, and it is so arranged that when the needle is at the bottom of its stroke the point of the hook is a little behind it and carries the thread with it to form the lock of the stitch.

One of the best methods of operating a sewing machine is by means of an electric motor. This is mounted on the table, beside the handwheel, against which bears a bush mounted on the motor spindle. In some instances the motor is started and the speed regulated by means of a foot-controller; in others, a switch lever fitted on the table acts as a starter, regulator, brake, and stop.

Care of the Machine. The machine which is regularly used and frequently oiled will not, as a rule, go wrong; it is irregular use and improper oiling that usually cause trouble. There are certain oiling points in every machine in which the spout of the oil can should be placed, but from time to time the underneath mechanism and that portion covered by the frame should be attended to. The main causes of stiffness in running are clogged or gummed up oil and dust, small particles of fibre and grit. A machine that is in regular use is subject to trouble caused by dust and fibre, and it is necessary to examine the unexposed parts and clean them up occasionally. Only the finest mineral oil should be purchased and a very small quantity used at a time, all the oil holes being noted so that the oiling is thorough.

It is in the shuttle race that dust is likely to congregate, and this portion of the mechanism must be kept quite clean; it can be wiped over with a soft rag soaked in paraffin, the connecting bars and other parts being wiped over at the same time. If the machine has been neglected and the oil has gummed up, it will be necessary to use a stiff brush with plenty of paraffin, which should be wiped off before the new oil is applied.

The regulation of the tension should be carefully attended to, for the success of the stitching mainly depends on it. Referring again to Fig. 1, the correct stitch is shown at A; but if the tension is not enough, the thread from the needle will not do more than hold the

thread from the shuttle loosely. If the tension is too tight, the shuttle may find a difficulty in passing through the loop, which is also liable to break, and, in addition, the shuttle thread, when it is pulled up, will be drawn through the material. The tension plates are fitted with a spring and an adjusting screw, so that different tensions can be given to the thread when sewing different materials. When the machine makes a good stitch with both the upper and lower tensions fairly slack, there is nothing wrong with the other adjustments.

Using the Machine. Faults in sewing are more generally the result of careless use than of defective mechanism. A bent or imperfect needle, which is a frequent cause of missed stitches, may be due to the needle not being set straight in the needle-bar, or the needle-bar being bent. Other reasons may be that the needle is incorrectly set or unsuitable for the size of the cotton. The take-up spring may be set too long, or the hole in the needle-plate too large. All these faults can be adjusted, with the exception of the latter, when a new plate should be fitted.

Special care should be given to the choice of the needle; makers usually give a table showing the size required for various thicknesses of cotton. The correct position is generally marked by a fine cut on the needle-bar, and when the eye of the needle is centred on the needle-plate the mark on the bar should coincide with one on the frame. The easiest way of centring the needle is to place an ordinary needle flat on the needle-plate and run the point of it into the eye of the machine needle, and let it remain until the screw is tightened up on the bar. The moment of the needle should be frequently tested, as the careless handling of the material before the needle is entirely raised will often cause a bend, and if this is allowed to remain it may not only cause missed stitches, but also damage the needle hole or the shuttle.

As a rule, the hand machine is easily worked, but the treadle machine is found difficult at first. In order to become well accustomed to the movement of the treadle, the balance or hand wheel should be loosened by raising the small catch so that it will

turn without moving the other parts of the machine. The presser-foot should be raised, both feet placed on the treadle, and the balance or handwheel revolved towards the machinist, never in the opposite direction. The feet are so placed that the toes and heels can be used with equal power, and have so much control over the treadle that the fly-wheel can be used slowly or quickly.

Practice should next be gained in guiding the material. For this the needle is raised, some material placed under it, and the presser-bar let down. The shuttle should not be used, and there should be no thread in the needle. The handwheel should be turned forward and the material guided as the feed carries it along. The presser-bar should be lifted to turn the material which on no account must be pulled, as this action will bend and perhaps break the needle, and on no account should the machine be worked unless there is some material between the foot of the presser-bar and the feed,

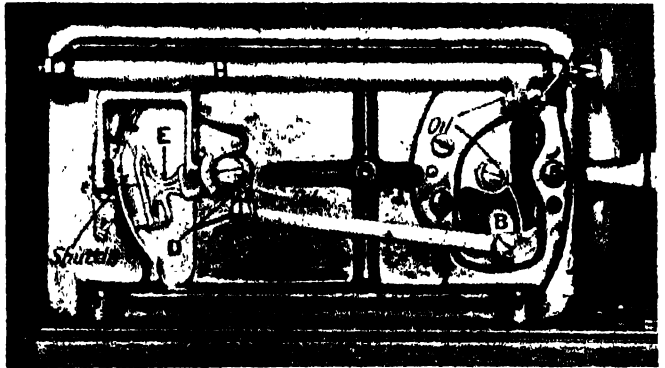


Fig. 4. Underneath view of vibrating shuttle machine, showing the positions of the various parts and oiling points

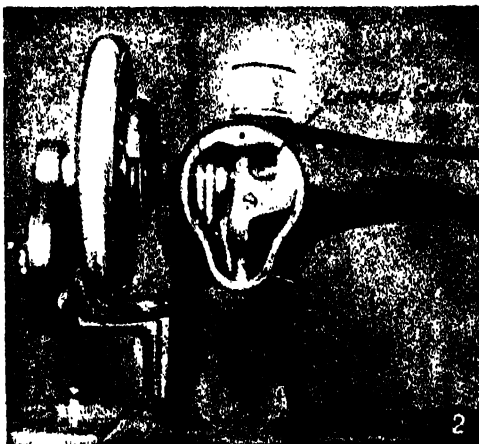
The action of the stitch regulator should be tested, and in those machines fitted with a reversible feed this should be noted and its action practised.

The method of winding the cotton on the bobbin is more or less automatic, but if the winding is not perfectly even the adjustments should be noted and, if out of order, put right. The shuttle should be fitted with a bobbin, and correctly threaded so that the cotton runs out freely. The needle is threaded and the tension tested, and then the actual sewing commences.

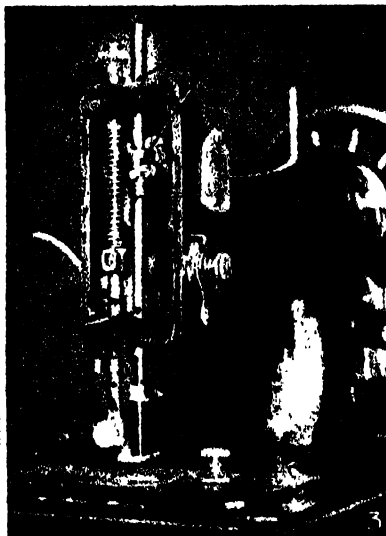
In all modern machines there are a number of attachments for use in various kinds of work. These include, amongst others, a straight guide which serves to direct the material in a straight line, and which can be adjusted in various distances from the stitch-hole. The quilter guide is used for quilting padded materials in straight lines and squares. It is attached to the presser-bar and is easily adjusted. An automatic method of hemming can be arranged by the use of the hammer, an attachment fitted to the presser-bar in place of the ordinary foot. The corder is a similar attachment, having a groove underneath to allow the cord to pass directly under the needle. The gatherer is a useful attachment adjusted by the length of stitch. It allows the lower of two pieces of material to be pleated or frilled, while the upper is straight and firmly stitched.

SHAD: The Fish. The several salt water fish of the herring tribe known as shad may be cooked in various ways, but perhaps the best methods are to broil it, or else to stew it in white wine, as in France.

To broil shad, scale, clean, and wash the fish, which should weigh from 2 lb. to 2½ lb., then cut off the head and score each side. Put it into a dish and sprinkle with salt and pepper, then pour over it enough oil to



Sewing Machine. Fig. 2. Interior view of vibrating shuttle machine, showing cranked spindle which produces a swerving movement in the vertical arm. Fig. 3. End view of the same machine, showing needle and presser bar, and also oiling points. See text for lettering



steep it and let it soak all night. The next day broil the fish very gently for about $\frac{1}{2}$ hour, turning it over during the operation. It is important to score it before putting it to soak, so that the seasoning may work into the flesh. Cook it each side about 20 to 35 min. Dish it very hot, and serve it with maitre d'hotel sauce.

To stew shad, scale and cleanse the fish and dry thoroughly, then bind it together with tape to prevent it opening where it has been gutted. Put it into an oval stewpan with 3 shallots, a clove of garlic, 1 blade of mace, 15 black peppercorns, a bouquet garni and salt to taste. Cover the fish with $\frac{1}{2}$ pint white stock and, if desired, $\frac{1}{2}$ pint white wine. Stew gently for 35 min., basting the fish occasionally, then dish it up and remove the tape. Strain off the liquor and add $\frac{1}{2}$ pint of it to the same quantity of bechamel sauce. Mix well over the heat and pour over the fish.

It is better to fillet the shad if it is to be fried. Dip each fillet into well-seasoned flour and fry gently in boiling fat. Garnish with fried parsley. The roe of the fish can be separated from it, doused, and fried at the same time as the fillets, and served with the fish. See Sauce.

Shaddock. This is an alternative name for grapefruit (q.v.).

SHADE: For the Eye. These shades may be classified under two headings. One type, generally for one eye only, is for holding in place boracic wool or other dressing which may be necessary. These shades are usually made of plastic, being flesh colour on the outside, green on the inside, and held in place by an elastic band around the head.

A reading shade for both eyes is made from stiffened cloth or card with a brass wire, which fits around the outer edge of shade and above the ears. It is used for keeping oblique light off the eyes, and in cases of inflammation to protect them from bright light. See Eye.

SHAGREEN. The fine grained parchment made from the skin of the shark is termed shagreen. It was formerly used for the cases made to hold tea caddies and similar articles. The word is also used for untanned leather with an artificially grained surface, usually dyed pale green, with which various fancy leather goods are covered.

SHALLOT. The shallot is a very useful and easily grown vegetable of the onion family. The bulbs may be set during winter or early spring at about 6 in. apart in rows 10 to 12 in. from each other. Deeply dug and manured soil is necessary to ensure good results. Late in July, when the leaves have turned yellow, the bulbs should be lifted, cleaned and stored for use. Old professional gardeners advise planting the bulbs on the

shortest day and lifting them on the longest day. If large bulbs are wanted the giant or Russian shallot should be grown. Shallots are excellent for pickling.

Use in Cookery. Shallots are used in cookery for flavouring purposes, and also for pickling. They resemble garlic, but are milder, and are often used as a substitute for the latter when a strong flavour of onion is objected to. To store shallots, hang them up in strings, but do not keep them in the pantry. See Garlic Onion, Pickle.

SHAMPOO: For the Hair. Shampoo can be bought in liquid, powder or even cream form. Powder shampoo is the most commonly used, and different kinds can be bought for different kinds of hair. Rinses can also be bought cheaply, but the following recipes may be used, if preferred:

For white hair, a rinse of one part ordinary washing blue to four parts water. For golden hair, put Camomile flowers in a muslin bag and pour on boiling water. Rinse the hair with this infusion when the lather has been removed. Medicated and brightening shampoo preparations should be allowed to remain on the hair in lather long enough for the chemical ingredients to operate, 5 to 10 minutes being the usual time.

Coconut oil is the basis of various oil shampoos which produce a good lather.

Dry shampoos, though injurious to the hair if used too frequently, have advantages that give them a ready sale. They can be safely used by people suffering from colds, and their action is so rapid that they make excellent emergency shampoos. The powder should be applied to the hair with a pad of cotton-wool, and removed later with a stiff brush. If the subsequent brushing is sufficiently thorough to remove all traces of powder, ill effects rarely follow.

Children's hair needs washing oftener than that of adults. Soap containing a little formalin makes a good cleansing shampoo, but the following recipe may be used: 1 oz. shredded soap, $\frac{1}{2}$ oz. carbonate of soda, 1 teaspoonful borax. Dissolve the soap in a pint of boiling water, then add the other ingredients. Use as much as is required, preferably warm. See Egg Shampoo; Hair; Henna.

SHAMROCK. The name is vaguely applied to all sorts of trifolios and clovers. The

true shamrock is either the white-flowered clover, *Trifolium repens*, or the yellow-flowered suckling clover, *Trifolium minus*.

SHANDYGAFF. This consists of a mixture of bitter ale and ginger beer, half and half; "rich man's shandygaff" is a mixture of champagne and ale, served usually in a pewter tankard and regarded as a great restorative.

SHANTUNG: The Silk. The crisp, hard-wearing, pale fawn coloured silk stuffs known as shantung are made by hand from the cocoons of the uncultivated silkworm. The threads are somewhat irregular, thick threads here and there not being regarded as blemishes. This material dyes well and is much employed in printed designs for dressing wraps.

Plain shantungs in natural or dyed shades wash and wear well. They are therefore suitable for children's clothes. Shantung should be ironed while it is dry or it will lose its gloss.

SHAVING SOAP and CREAM. Advantages held by shaving soap and shaving cream over ordinary household soap, for use with a razor, do not need emphasising. With them, the shaver can raise a quick and easy lather which, moreover, has not the harsh effect of some ordinary soaps when used for shaving.

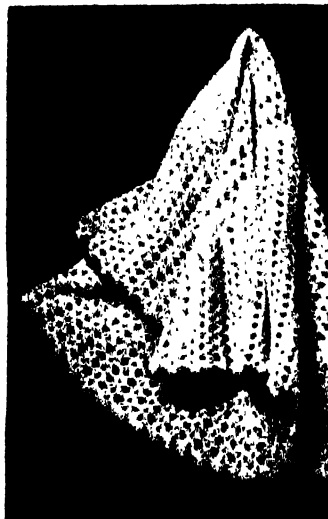
Some shavers use hot water, some cold. It is mostly a matter of choice in connexion with shaving soap. Ordinary shaving cream is rubbed on to the face with the fingers, and then (as with soap) worked up into a frothy lather with brush and water. A brushless cream does not need to be made into a lather; it is simply rubbed on to the face, as though it were an ointment, and then the razor follows.

For economy's sake, if the cream is in a tube the screw cap should be replaced each time after use. And shaving soap, whether in stick form, or in cake form in a bowl, should not be left sodden with water nor exposed to the air. In dry shaving (with electric razor or other dry shaver), no soap or cream is necessary.

Special creams are available for those with tender skins. See Razor.

SHAWL. Shawls may be divided into four classes: the knitted or crocheted, the woven woollen, the woven silk, and the lace variety. Those in the first class are mainly utilitarian. Good patterns for knitted or crocheted shawls with full instructions can be obtained from wool shops and fancywork departments in stores.

Three oz. of white Shetland wool, $\frac{1}{2}$ oz. of pink or blue wool of a similar thickness, and a medium-sized bone crochet-hook are needed to make the baby's head shawl shown in our illustration. Commence with the white wool in the centre of the shawl by making 8 chain and joining to form a ring. For the first round work 3 chain to form the first treble, 23 treble into the ring, and join with



Shawl. Baby's head shawl knitted in Shetland wool

a slipstitch to the 3 chain at the beginning of the round. The second round consists of 3 chain to stand for a treble, 1 more treble into the same place, 2 chain, 2 more treble into the same place, * miss 2 treble of the previous row, 2 treble into the next, 2 chain, 2 more treble into the same place, miss 2 treble of the previous row, 2 treble into the next, 2 chain, 2 more treble into the same place; repeat from * all round and join with a slipstitch.

The third round is worked thus. Slipstitch into the space between the treble of the previous row, * 3 chain to stand for treble, 1 more treble into the same place, 2 chain, 2 more treble, 2 chain 2 more treble, and into the next space between the treble of the previous row work 2 treble, 2 chain, 2 treble all into the same place. Into the next space between the treble work 2 treble, 2 chain, 2 treble, all into the same space, and repeat from * all round, joining with a slipstitch. Continue in this manner, always making one extra pattern between each corner pattern, until the shawl is the right size.

Begin the edging by working 7 treble into each space between the treble of the previous row. Then between each pattern work one



Shallot, an onion family vegetable of the onion family which is largely used for pickling

double chain; then another 7 treble into the next space between the treble of the previous row. With the coloured wool work all round the edge of the treble in double chain and the shawl is done.

Woven Shawls. Many of the woven woollen shawls are also merely useful, being made in quiet colours with border of deeper tone and plain fringe, or in checks and tartans; but there are, in addition, hand-woven shawls which are carried out in brightly contrasted stripes or with floral borders, while gaily embroidered woollen varieties are often picked up as souvenirs when abroad, and can be utilized in a number of ways.

The finest woven all-over patterned or embroidered shawls come from Kashmir, and are made of the soft under wool of the special shawl goat. These shawls are highly valuable possessions when made at the best period. Similar shawls of inferior quality were made in India and have been imitated in France, and the Paisley shawl was modelled on them.

Shawls of several different patterns, chiefly oriental, are made in Paisley. The best known design is the pine or cone, woven generally on a red ground, with yellow, blue, green and other threads. A black centre is a characteristic of some of these shawls.

The richness, harmony and brilliance of the colours are as remarkable as the permanence which leaves shawls 100 years old as beautiful as ever. Their wool is attractive to moths, and they should be protected by wrapping in newspaper in storage. They can be washed and cleaned, but it is advisable to keep them out of the way of dirt.

To the woven silk class belong the most beautiful of all shawls: Chinese varieties, hand embroidered on heavy crêpe, some in self colour, others with flowers and birds in many brilliant hues on a black or coloured ground, fringed with knotted silk. Less expensive are plain silk and crêpe-de-Chine shawls, relying on beauty of colour and fringe for their decorative value. Such shawls can be made with four squares of crêpe-de-Chine, each a yard square, joined together with faggot-stitching, a hand-made tasselled fringe in self-coloured silk trimming the edge. Other evening shawls are of tinselled brocades with woven coloured borders.

Lace shawls are usually Spanish lace, black or white silk blonde, or Limerick needle-run or appliqué, and though more often square, are occasionally triangular in shape. There are also the Egyptian shawls of tinselled net and the silk embroidered net Rumanian shawls.

SHEARER: The Style. The work of Thomas Shearer as a designer is largely associated with that of Hepplewhite. In general it was in the direction of simplicity, and a reaction from the more ornate designs of Chippendale. The two assisted in bringing about a revival in the use of turning, and are considered to have done more than any other designers to develop bedroom furniture.

Some of Shearer's pieces, notably his tables, of which new types were introduced under his influence, possess considerable distinction. Mention may also be made of his tea caddies. Square, oblong, or round in plan, these were delicately inlaid or painted with fans, ovals, or circles upon their tops.

SHEARS: For the Garden. An ordinary pattern of garden shears is illustrated in Fig. 1, which is typical of a variety of similar implements ranging in size of blade from 4½ to 10 in. long. A convenient size for ordinary use has blades 7 to 8 in. long. The handles, which are usually longer than the blades, are made of hardwood and very securely fixed to the tangs or ends of the blades.

As a good cutting action depends upon the correct manner in which the two cutting edges close over one another, it is imperative that

the joint shall be a close one, and keep the faces of the blades in contact with each other during the cut. In the better patterns contact is effected by tightening up the pivot pin.



which takes the form of a bolt with a fly nut and spring washer. This may be correctly adjusted by tightening the nut as occasion requires. The joints should be lubricated with ordinary light machine oil.

To clean the blades, the nut is unscrewed, the spring washer removed, and the two parts of the shears separated, any dirt which prevents the blades working freely being cleaned away with a greasy rag or with one saturated in paraffin. This cleaning process should be followed by a liberal application of lubricating oil, and, if necessary, the cutting edges should be sharpened on an oilstone and the shears reassembled. The cutting edge forms an angle with the flat or under side. This angle must be maintained, and on no account should the flat side be touched with the stone.

Different types of shears are made with straight handles or with a cranked handle. The object of the latter is to enable the shears to be operated over a flat grass lawn without the necessity of knocking the knuckles on the ground, the crank enabling the blades to be kept parallel with the ground and to cut over

the whole length of the blade. Either type of shears may be used for grass cutting or for trimming privet, yew, and similar hedges.

Shears are invaluable for working round odd corners and places where it is not possible to use the lawn mower. They are employed



Shears. Fig. 1. How a pair of garden shears should be used for small patches of grass. Fig. 2. Using small shears to clip the edge of a curved border

also for trimming the edges of lawns, and to keep the grass edge straight; it is as well to stretch a garden line along the edge of the bed or path, and to cut the grass accordingly.

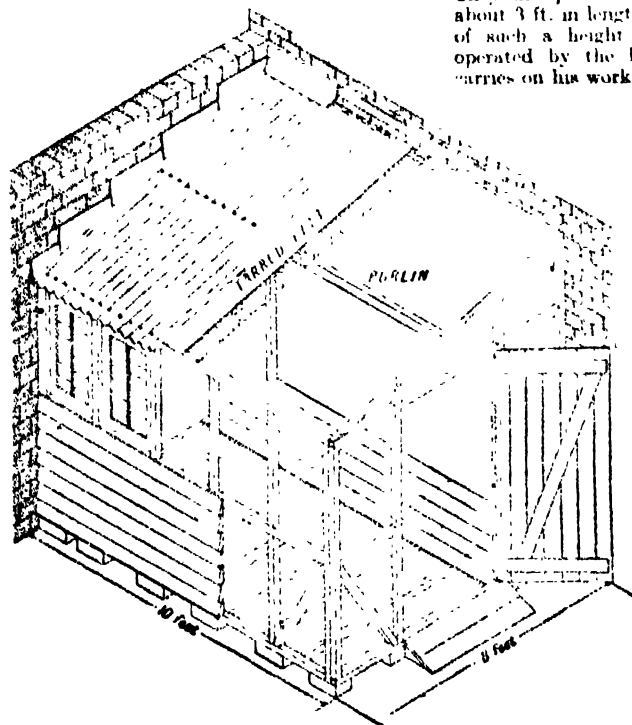
For cutting round curved borders and in awkward corners, the grass shears illustrated in Fig. 2 are useful. These are formed of a single piece of metal, the two ends forming the blades, with a U, or bend, more or less circular in shape, acting as a spring. This implement is operated with one hand by squeezing the blades together and then releasing them.

When any considerable length of grass edging or border is to be trimmed, it is desirable to use a regulation pair of edging shears. So far as the blades are concerned, these are shaped like and operate upon the same principle as ordinary garden shears, but the shanks of the blades are turned up nearly at right angles and in the same plane as the blades. They are provided with hardwood handles, about 3 ft. in length or more, they should be of such a height that they can easily be operated by the hands while the gardener carries on his work in an upright position.

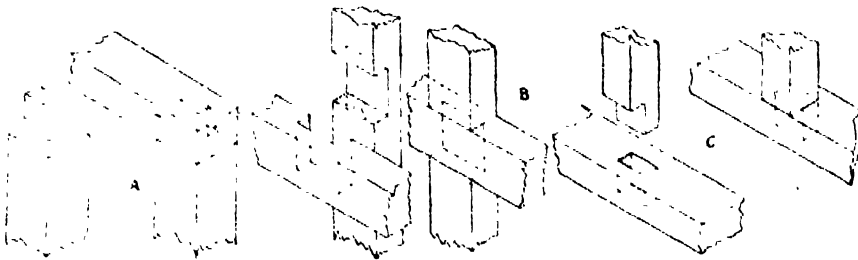
There is a certain knack in handling these shears which can only be acquired by experience, but, in general, the left hand should grasp the handle that is attached to the bottom one of the pair of blades. Consequently, this handle should be kept more or less stationary, so that the bottom blade glides along the ground, while the right hand manipulates the other handle.

Shears of all kinds should be smeared with petroleum jelly when putting them away, as this will prevent rusting and keep the edge in good condition.

SHED. A light structure, generally made of wood, the shed is seen in many shapes and sizes. Its main use is for the storage of materials and tools, but it is also used for potting plants or for a smaller amateur workshop. Diagrams and



Shed. Fig. 1. Diagram showing a substantial lean-to workshop, built in the angle formed by two walls. Full particulars of construction, together with the quantities and material required, are given in the next page



Shed. Fig. 2. Principal joints used in building the lean-to shown in the previous page. A, mortise and tenon. B, halved joint and how it fits together. C, mortise and tenon for top and bottom of uprights.

instructions for building a bicycle shed are given on page 94 of this Encyclopedia. Particulars of a larger and more substantial structure to house a motor cycle combination are given in the article on Garage (q.v.). A light garden shed is described and illustrated on page 511. An excellent shed can be constructed along the lines indicated for a garage, varying doors and lighting as needed.

Lean-to Building. A shed or outhouse intended as a permanent erection may quite conveniently take the form of a lean-to built into the angle formed by two walls, as shown in Fig. 1. The shed is 10 ft. long by 8 ft. wide, and the height to the eaves is 7 ft. The following material is required:

- 150 ft. run 2 in. sq. deck.
- 50 ft. run, 3 in. by 2 in. deck framework.
- 11 door and framed door 6 ft. 6 in. by 1 ft. 6 in. wide.
- 1 pair 18-in. cross garnets, lock and key.
- 80 sq. ft. 1 in. tongued and grooved sheathing.
- 9 sets hinge bolts 3 in. by 2 in. for floor joists.
- 5 windows (casements) glazed with butts, sash and casement sashes.
- 1 10 ft. length bottom, 2 in. by 4 in. for the flashing.
- 5 sheets of corrugated galvanized iron, 9 ft. by 2 ft. 2 in.
- 1 roll of roofing felt.
- 15 yd. of 2 in. galvanized wire netting, 2 ft. wide, or alternatively 1 square (100 sq. ft.) of 1/2 in. T. G. and B. matchboard.
- 80 sq. ft. 1 in. rebate 1/2 in. thick for the walls.
- 70 lb. 1 in. by 1 in. arcotex for door and windows.
- 7 lb. paint.
- 1 gall. preservative.
- Nails and screws.

No allowance has been made for a foundation, as it is presumed the yard has already been cemented over or paved. If not, this will have to be done, either with cement, concrete or asphalt. In either case the framework and joists should rest upon bricks, placed about 1 ft. apart, so as to allow free circulation of air and prevent damp rising. The ground being prepared, proceed by making up the front of the building in one section. Then make the end section. Fig. 1 shows the general idea of the work, while details of the different joints are given in a separate diagram (Fig. 2).

Having made the two frames, erect them on their site and bolt the corners together with

5 in. by 1/2 in. coach bolts and nuts. Secure the framework to the wall of the house with staples and screws. The weatherboarding can then be added, nailing it to each upright with 2 in. wire nails. The windows can either be made or purchased ready for use. Horticultural or "greenhouse" glass will be quite good enough for the glazing. The roof is most conveniently covered with corrugated iron, but it should be lined inside with tarred felt supported on galvanized wire netting or, alternatively, may be boarded with match-lining.

When walls and roof are complete, lay the floor joists, and securely nail the flooring with 2 in. floor boards. The joists and the underside of the flooring should be coated with creosote as a preservative. A strong and rigid floor is very necessary, especially beneath the legs of the work bench and any other heavy tools. A gutter and drain-pipe may be added if desired. Make a good watertight connexion between the corrugated iron and the walls, by means of proper flashings fitted as indicated in Fig. 1. A lean-to built in this way might become a landlord's fixture, but if a framework is made for the end and back of the structure where they abut on the existing brick wall, and the roof is supported at its junction with the walls by battens screwed to blocks let into the brickwork, the fixture will be a tenant's fixture, and therefore will be removable.

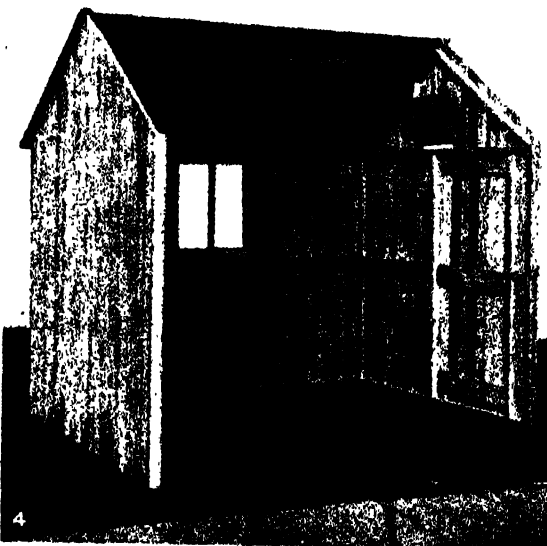
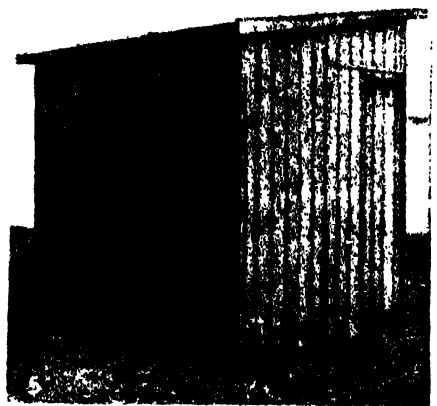
Sectional Building. We illustrate representative types of shed which are sold made up in sections ready for erecting. The ends and sides are bolted together and the roof frames are fixed on top. There is a great deal of competition in this class of product, and some very cheap stuff is to be met with. It is least expensive in the long run to buy a good substantial building, since the first cost is

then the only one, for some years at least. If the covering material is weatherboard, then the purchaser should specify that it be either the rebated or the tongued, grooved and moulded variety (3/4 in. to 1 in.), which presents a flat surface to the interior. If vertical boarding is employed the material should be T. G. and B. matchboard, not less than 3/4 in. and preferably thicker. Unless a bricked or concreted site has been prepared, a flooring will be needed, laid on 3 in. by 2 in. joists, which in turn rest on sleeper plates supported preferably by low brick piers. The floor boards should be 3/4 in. to 1 in. thick, and should be tongued and grooved.

Legal Points. If a tenant erects a shed on his premises for temporary use during his occupation he will ordinarily be able to remove it at the end of his tenancy. If, however, the shed is in the nature of a permanent structure and cannot be removed without material injury to the property, the tenant must leave it as the landlord's property. Thus a conservatory entirely detached from the house could probably be removed, but one fixed to and communicating with the rooms would belong to the landlord and be irremovable.

The erection of some sheds is controlled by regulations as to the position of the structure and the materials of which it may be built, and inquiry as to these should be made of the local authority.

Where premises are insured against fire, a shed added later will not be covered by the policy unless an arrangement to that effect



Shed. Fig. 3. Exterior view of a sectional span roof workshop or tool shed. Fig. 4. The same partly erected, showing method of assembling the sections. Fig. 5. Useful lean-to shed made up on the same principle.

(Courtesy of Alfred Turrell & Sons)

is made and an additional premium paid if required. The presence of a wooden shed near to a house may increase the premium on the house itself. If the shed is of any particular value, or if it adds to the value of the house (as would probably be the case if a garage were erected), the rates on the house will probably be increased.

SHEEP. The main article of food that is obtained from the sheep is known as mutton, but other parts of the animal make nourishing and economical dishes.

Sheep's Head. To make a good broth procure a sheep's head ready dressed from the butcher. It must be soaked in warm water for an hour to finish the cleansing. The head should be split open and the tongue and brains removed. Place the two halves of the head in a large saucepan with 3 qt. cold water, bring

to the boil and carefully remove all scum. Add $\frac{1}{2}$ oz. salt, 2 onions, 2 carrots, 2 turnips, $\frac{1}{2}$ a head of celery, and a bouquet garni. Simmer gently for 3 hours, then take up the head, cut off the flesh and shape in neat pieces. Strain the broth, return it to the saucepan with the pieces of meat, add a few freshly boiled vegetables cut in shreds, and 3 oz. well-washed rice. Simmer it for half an hour and pour into a tureen in which two tablespoonfuls of chopped parsley have been scattered.

The tongue and brains may be used for some other dish as a garnish, or they may be cooked and served covered with tomato or piquant sauce. Two ounces of pearl barley make a very good thickening for this broth in place of rice. Blanch the barley for 10 min., then tie it loosely in a muslin bag and add it to the soup with the vegetables. When the soup is strained, untie the bag, and stir the barley into it. Sometimes the vegetables first added to flavour the soup are cut small and served with it; if this is done the soup need not be strained, and the barley, after being blanched, may be added loose when the soup is half cooked. The meat from a boiled sheep's head may be pressed into a mould and filled up with jellied stock. Cover and press with a weight and turn out when cold.

Sheep's Heart. A sheep's heart is first washed in two or three successive lots of warm water, freed from pipes, etc., and then soaked for $\frac{1}{2}$ hour in cold, salted water. Dry it in a clean cloth, stuff it with sage and onion stuffing, and sew up the hole. Roast it in an iron pan in which a lump of dripping about twice the size of a hen's egg has been melted. Let the pan stand on low heat, and baste the heart frequently with the fat. The cooking should take about $\frac{1}{2}$ hour. Serve the heart with red currant jelly and some sauce made by thickening some of the fat with a little flour, mixing them smoothly, and adding some stock.

Sheep's Tongue. This dish may be prepared in several ways. Frying is perhaps the simplest, and can be done in the following way. Soak 2 tongues in cold salted water for 3 hours, then wash them in clean water and put them into a pan containing enough stock to cover them. Cook them very slowly until they are tender; then skin and trim them and slice each lengthways into halves. Season the pieces to taste, coat them with flour, then brush them over with egg and roll them in fine breadcrumbs.

Fry them in a pan of smoking hot fat, and when they are golden brown on both sides lift them out and serve on a bed of mashed potatoes. A little gravy can be poured round.

Sheep's Trotter. To fry, prepare 4 trotters by washing and scraping them, boil them up in a pan containing just enough cold water to cover them, and then strain off the water and reuse the pan. Wash the trotters for the second time, and put them back in the pan with enough white stock to cover them.

Cook them gently until they are tender, then take them out and bone them, finally pressing them between two plates with a weight on top. When they are quite cold, cut them into pieces of a convenient size, season to taste, brush them over with egg, and coat with breadcrumbs. Fry them in a pan of smoking hot fat, and serve garnished with parsley and cut lemon. Any suitable sauce can be served separately.

For baking, prepare the trotters as directed in the previous recipe, cooking them in stock until they are tender, and then cutting the meat into neat pieces. Put some of the latter into the bottom of a greased dish, cover them with some sliced tomato and seasoning to taste, and on the top put a layer of fine breadcrumbs. Continue in this way until the dish is full, and

on top of the last layer, which should be of breadcrumbs, place a few small pieces of margarine. Pour in about $\frac{1}{2}$ gill stock, and bake the whole in a warm oven until it is a golden brown. See Brains, Brawn; Mutton.

SHEEPDOG. The old English sheepdog is a most attractive animal. His shaggy coat, in which there is no curl, coupled with a closely docked tail, gives him a quaint appearance, and at the same time affords ample protection against the worst of weathers.



Sheepdog. Thoroughbred specimen of the attractive breed known as the old English sheepdog

If he is groomed every day there is no reason why the coat should become matted or untidy. The colour may be any shade of grey, grizzle, blue or blue merled, with or without white markings. What is termed a pigeon-blue is much esteemed. The forelegs should be heavily boned and dead straight, and, as they are clothed with hair to the feet, they look enormous. See Dog, Kennel, Lurcher.

Sheep Laurel. See Katana.

SHEEPSKIN. Sheepskin is used a great deal for bookbinding, but its wearing qualities are not of the best, and its use is confined to the cheaper class of work. It is not so suitable for ladies' handbags or hats, or such goods as are not glued or pasted on to a hard substance.

SHEFFIELD PLATE FOR THE COLLECTOR

With Particulars About its Marks and Decorations

Various articles in this Encyclopedia deal with the collection of articles for beautifying the home, the aim being to indicate what is possible to the average household. Such include Brass; Pewter; Silver; see also Candelabrum, Gadroon, Jug, Vase, etc.

Much of the plated Sheffield ware of to-day is really B.M., i.e. Britannia metal, an alloy which was instrumental in killing the pewter trade, as the various articles in which it could be covered over with a deposit of silver. Much, too, is E.P.N.S., i.e. electro-plated on nickel silver, a useful combination of decorative silver with a hard-wearing metal, the silver being deposited by the aid of electricity.

The credit for discovering a method of thinly coating a base metal with silver is due to Thomas Boulsover, or Boulsover, presumably but not certainly a native of Sheffield; but the practical developing and perfecting of the new process is due to another Sheffield man, Joseph Hancock, a cutler, who died in 1791. Sheffield plate of value to collectors was made during the latter half of the 18th and the early half of the 19th century.

The manufacture of this plate consisted in the overlaying of an ingot of copper alloy with a thin sheet of silver, both absolutely, i.e. chemically, clean and level. By means of a borax flux, applied to the edges of the silver, adhesion at the edge was secured when the fusion of the silver began in the furnace. The ingot, when removed from the furnace and cleaned, was rolled out to the thickness required, or to that suggested by experience.

In covering books or other articles with sheepskin, glue is generally used in preference to paste. This applies more to split skins than to those of full thickness. To prepare the leather for gold tooling or lettering, it should be washed with paste water, which is thin paste about the consistency of milk, and afterwards with two coats of glue (white of egg), or, better still, with glue water and one coat of glue. Untanned sheepskin, sometimes used for bookbinding, is known as basil. See Bookbinding; Leather.

SHEET. There are two standard sizes of sheets, namely, for double beds and single beds. In cheaper makes single sheets are sometimes too small for comfortable use on a bed 3-ft. wide and of full length. All sheets are usually bought in pairs, and the length should be judged by the length of the bed, allowing for a good turn over at each end.

Materials vary according to the taste and means of the purchaser. A heavy linen sheet wears better than any other, and is preferred by most people, especially in the summer. As linen is colder than cotton because of its smooth surface, some people prefer not to use it in the winter. The cotton materials range from coarse twill to a smooth and strong union. A good union, while not as expensive as real linen, is satisfactory in wear, and is pleasant to the skin. Sheets may be quite plain, embroidered at the tops, ornamented with hemstitching, or with wide crochet edging.

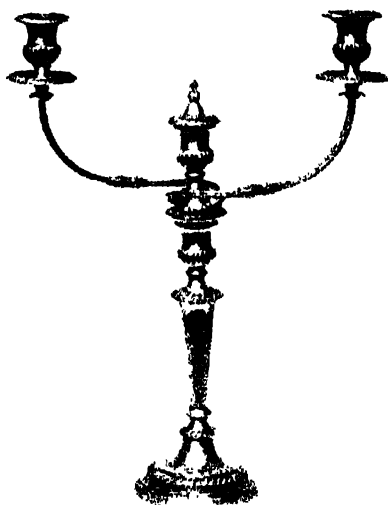
An embroidered initial in the right-hand top corner is almost essential to the housewife who prides herself on her house-linen. If the name is marked in ink, it should be at the extreme end of the top hem, and so arranged that when the sheet is turned down the name is hidden underneath. The initial, on the contrary, should be arranged so that it is plainly visible. Some people like an elaborately embroidered monogram in the very centre of the top, thus serving instead of other embroidery.

Sheets should be aired when they come back from the laundry. If the house has a good hot cupboard, it will be enough to put them away in their places, and when they are used again they will be sufficiently aired. See Initial, Linen, Marking, Mending, Pillow Case.

Later the process was extended to silver-plating on both sides of the copper alloy. This necessitated much care in preparation of the ingot, as the sandwich of copper and two silver sheets required two outer protecting sheets of silver, mechanically treated to prevent adhesion to the under sheets.

The branched candlestick illustrated in Fig. 1, which dates from about 1780, shows the popular gadroon ornament. This type of added edging was either in fine silver, or else copper alloy much more thickly cased with silver than the rest of the article; and in many cases the copper shows through the thinner plating while the ornamental borders remain unimpaired with repeated cleanings.

The ornament on Sheffield plate will be found to be chasing of the kind known as flat surface chasing, or else what is now called repoussé work, and in some pieces both methods are combined. In flat surface chasing the design is carried out with a blunt punch, which is held vertically in one hand and hit by blows from a special hammer. Nothing is removed from the surface of the metal, as would be the case in engraving it with a burin or a scraper. In repoussé the raised portion is worked from the back. In the case of circular and oval articles, the border is



Sheffield Plate. Fig. 1. Branched candlestick, c. 1780, an example showing dated decoration and gadroon edging. A holder for a third light is held by a stopper.

made separately and secured by means of solder. An example of such a border is illustrated on the wine cooler shown in Fig. 2. Many articles are ornamented with a geometrical or strapwork pattern with the field or background punched out in a press. It was found that better results were obtained in this way than by piercing, i.e. cutting with a saw and finishing with a file, as was done by silver smiths. The sugar basket illustrated in Fig. 3 is a beautiful example of such work.

The marks on Sheffield plate are many in number considering the short period past over a century, during which the ware was being made. They generally consist of the maker's name and sometimes a device before and after it. The Sheffield plate makers do not seem to have followed the example of the potters and deliberately to have used marks which were conspicuous imitations of the silver hallmarks. Some ware has the name of the firm only, some a device or device only.

As the best styles in decoration of Sheffield plate coincide with the Robert Adam period the most desirable pieces to collect show classical influence and ornament. In addition such pieces are to be preferred because they

are practical and more easily kept clean than the heavily chased and embossed style of ornament which came into fashion later in the 19th century. Utility is the best guide as to which pieces to collect. The classical vase

shape with very little decoration beyond beading, is beautiful for a hot-water jug (Fig. 4), for coffee pot and milk jug. With such pieces and two pairs of candlesticks, a planter caddy, a cake basket, which is equally useful for fruit, and an oval tea-tray with a pierced work rim, would make a representative and useful collection. Sheffield plate is occasionally picked up at auction sales for comparatively small prices, but is worth obtaining in good shapes with restrained ornament.

Inkstands are useful of the simple type with decorated edge and look particularly well flanked by candlesticks of Adam design, or in the company of a wax-jack taper holder such as that illustrated in Fig. 5, with ornamented border.

If a wax-jack splay Sheffield plate is to be used in the home, it must be carefully cleaned and handled, and it should require repairs it must go to an expert. For the cleaning of Sheffield plate where the copper does not show through in places, good plate powder is quite safe. Where the copper is exposed none of the polishes that contain oxalic acid is to be used, as the acid eats slowly into the base metal. Pieces in this state are unsuitable to hold food, unless they are relined.

SHELF: How to Fix. In fixing up shelves it is generally preferable to use shelving board, which is a simply good quality white or yellow deal in a prepared form. The surface is to be planed to a good finish, the edges and sides are clean and square, and the material is uniform in thickness and width.

Shelving board is obtainable in various sizes, those chiefly used by the amateur are known as 6, 7, 9, and 11 in. boards, and range from $\frac{1}{2}$ in. thick up to about 1 in. These sizes are nominal, and the actual diameter will men are somewhat less than those mentioned. When planning shelves, it is well to bear this in mind, and also to make the width of the proposed shelves appropriate to the stock widths of the shelving board, as this obviates the necessity of ripping several lengths of timber and planing the edges up to obtain the requisite width. Generally it is possible to provide most ordinary shelves by using a single-width

board, and the most handy width for an ordinary shelf is 9 in.

When it is desired to use a width of, say, 12 to 14 in. or thereabouts, 2 ordinary, straight-edged boards can be used and the edges held together with cross battens screwed to the underside of the shelves, or the edges may be properly planed up and glued together. Alternatively are to use tongued and grooved floorboard. When 2 or more pieces of board are placed edge to edge, the tongue of one board fits into the groove of the next and so on. Consequently as one surface of the floorboard is prepared nicely finished up, it can conveniently be used for the wider varieties of shelves.

All that is necessary is to remove the tongue from one side by chiselling it off and, if necessary, cleaning up the edge with a small plane. If the boards are arranged so that the tongue is on the face or visible side of the shelf, there will be no need to remove the grooved portion of the board which adjoins the wall. For spans up to 3 ft. or 4 ft., tongued and grooved

floorboard will answer perfectly, if supported by battens or bearers of some kind at each end, and in cases where they are fitted against the wall or in a recess they may be supported on the inner side by a long batten or billet secured to the wall. Shelves are preferably secured to the bearers with screws, as they can then be removed when desired without damage either to the boards or to the wall. It is necessary that they should be fixed, otherwise the joints will separate. Alternatively, the boards may be united with battens of wood screwed to the undersides of the shelves, as above described.

With regard to the thickness of material, it can be taken as a basis that the ordinary 9 in. shelving, 1 in. thick, will be satisfactory for spans up to 3 ft. or 4 ft. From 3 ft. to 2 ft., a $\frac{1}{2}$ in. shelf should be used, and for less than 2 ft., $\frac{3}{4}$ in. shelving is generally satisfactory.

The method of supporting the shelves is determined by their location. If it is practicable to fit battens or bearers to the walls, this plan is to be recommended. The battens may conveniently be secured with fibre plugs and screws. When the shelves are not near a return wall on which the ends may be carried by



Sheffield Plate. Fig. 4. Hot-water jug of classical Adam design, c. 1784.



Fig. 3. Sugar basket dated 1784, ornamented with geometrical open-work design, chasing and beaded edges.



Sheffield Plate. Fig. 2. Wine cooler, c. 1780, with decorated handles and border.

All photographs by courtesy of Chapple & Mantell.



Fig. 5. Wax-jack, c. 1800, with ornamental border and handles.

bearers, the best method is to fix vertical battens to the supporting wall at suitable intervals, and to carry the shelving on brackets screwed to these uprights. The shelves should be notched round the verticals to fit close to the wall.

When movable or adjustable shelving is wanted, the home worker can utilize slotted iron strips of the kind described in the article on Bookcase (q.v.). See Dresser.

SHELL: Collecting Specimens. With out going out of the British Isles, about 350 different kinds of shells may be found, the colour and pattern of each varying within wide limits. Every country walk or seaside ramble may therefore yield a new specimen for the collection.

The land shell, which will be met with most frequently is the snail, since there are about 40 different types. They may be found all the year round, although the months from April to December yield the largest harvest. The evening, and especially the evening of a damp day is the best hour during which to search for snails, since this is their usual feeding time. At other times search may be made under rubbish heaps, among tree roots, under fallen logs, stones, and leaves.

The snails most frequently found are the following: the common snail, with dark brown bands on an olive shell; the shrub and garden snails, which are similar, but both classes vary in colour; the gilded snail, with a yellowish-green shell not unlike the prettier and more rare green snail. In addition to these there are the pale green heath snail and the greyish bristly snail, the gored snail, found where chalk and lime abound, and the black-tipped snail, frequently mistaken for it.

As regards salt-water shells, any stretch of beach will prove a veritable treasure trove. Many of the shells will be broken, and therefore of no value, but any bunch of seaweed or small rock pool may be searched with profit. A pocket lens should be included in the shell hunter's outfit, since many shells, especially those found in sea-water, are extremely small, and only a lens can decide the difference between two shells which may look alike to the naked eye. If the shell is boiled in order to clean it, the minute will be killed in the process. It may then be removed by means of a wire or pin. The boiling removes dirt, salt, etc., from the shell. Each shell should then be dried and painted over with white of egg, or a thin solution of gum arabic, before being added to the museum.

The small white cardboard boxes used by jewellers make excellent cabinets in which to store the shells, although larger boxes will be required for larger shells, such as oysters, mussels, scallops and the like. First put in a layer of cotton wool and then arrange the shell on this, using white cotton wool in the case of dark coloured shells, and vice versa. This done, label each box with the name of the specimen and the date and place of finding. If any of the specimens cannot be identified, a visit to the nearest reference library, where the coloured plates of books on shells can be consulted, will soon solve the difficulty.

SHELLAC. Shellac is a fine resin, found in Indian trees, and is due to the action of the lac insect. The larva punctures the bark of the tree twigs, feeds on the gummy or resinous sap, and exudes a secretion which embeds the insect. The female secretes a red fluid known as lac dye.

The lac includes the twigs 2 or 3 in. long, on which it is formed in nodules, and is known as stick lac. For export to England it may take the following forms: seed lac, shellac, button lac, or garnet lac. Seed lac consists of the small lumps of natural lac broken off the twigs and washed.

Shellac is melted out of seed lac in rough bags held near a charcoal fire, the bags being

wrung to squeeze out the molten resin. It is spread on cylinders, allowed to cool, and scraped off in flakes. The best quality of shellac is of a bright pale orange colour, quite transparent, and free from dirt and grit. Button lac only differs in that it is melted into larger pieces. Garnet lac is moulded into thick, flat pieces.

Shellac is soluble in methylated spirit and spirits of wine, and in this form is used as a French polish. It is also employed to make lacquers, or spirit varnishes, in various degrees of clearness. Although lacquers may be made up from the raw material, it is better to obtain prepared solutions from a reputable firm, specifying the colour or absence of tint required. See French Polishing, Lacquer Polish, Resin, Varnish.

SHELLFISH. People with delicate digestions can more often eat oysters than any other kind of shellfish. If tinned shellfish are used, the contents of the tin when opened should at once be turned out into an earthen ware bowl and carefully examined.

Many people suffer from a peculiar idiosyncrasy which causes the development of a digestive upset of greater or less severity after eating shellfish of any kind. With others these symptoms only develop if the shellfish have not been perfectly fresh. The symptoms in these cases resemble those of ptomaine poisoning, and the same treatment is to be carried out. See Crab, Fish, Lobster, Mussel, Oyster, Prawn, Ptomaine Poisoning, Shrimp, Winkle.

SHELL STITCH: In Crochet. The shell stitch forms a solid or all over pattern in crochet work. The original stitch is a cockle shell shape, as seen in the sample illustrated, but there are many modern variations of it with spaces between the shells, and alternate rows of open stitches and solid shells. It is used where a close pattern is required.

The number of chain stitches on the foundation row should be divisible by 3 with 2 stitches over. To work the first row, put 1 treble in the fifth chain from the hook, then 3 more trebles in the same place. * miss 2 stitches, 1 double crochet in the next stitch, miss 2 stitches, 5 trebles in the next stitch, and repeat from * to the end of the row, finishing with 1 shell of 5 trebles.

For the second row slip stitch over the first 2 trebles of first shell, and work 1 double crochet into the centre treble of the same shell, putting the hook into the back loop of the stitch throughout the pattern. * 5 trebles in the next double crochet, 1 double crochet in the centre treble of the next shell and repeat from * to the end of the row, finishing with 1 double crochet in the centre of the last shell, turn with 4 chains.

For the third row put 4 trebles in the first double crochet over which the turning chains stand, then 1 double crochet in the centre of the next shell and repeat shells and double crochet alternately all along. Take note that a shell is always worked over a double crochet, and a double crochet in the middle of a shell of the previous row. Repeat the last 2 rows for the amount of pattern required if a straight piece of the same width all the way up is wanted.

Where a sloped edge to narrow the piece is desired, the decreasing

is made on the shell by working 3 trebles only in the end shell, and also where the shell begins in the row at the opposite side. Then, in the return row, this decreased shell is worked into a point. By this method of working a gradual slope is given to the piece. See Crochet.

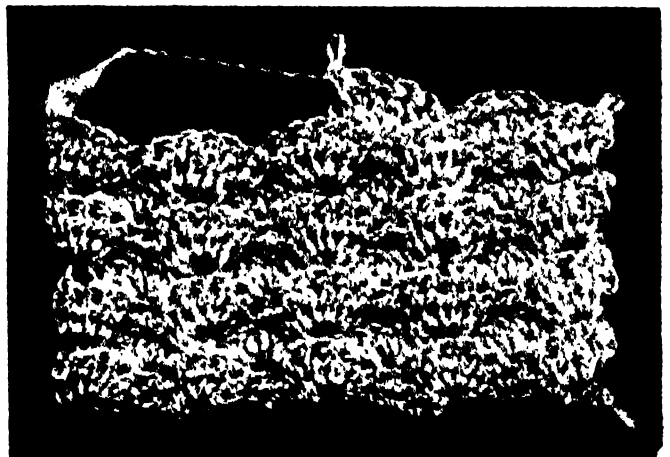
SHEPHERDS' PIE. Mash 2 lb. cooked potatoes, add to them 1 oz. cooked margarine, according to taste, and a little milk if the mixture is too dry. Put a layer of these potatoes at the bottom of a greased pudding, and a little round the sides, and fill the dish, to within an inch of the top with 1 lb. of cooked meat and one or two rashers of bacon also dried.

Pour over some gravy made by melting 1 oz. margarine in a pan, stirring in 1/2 oz. flour, and cooking the latter, together with 3/4 pint of stock, until it is thick. Add 1 pint of water, and stir the gravy until it boils, then season it to taste. After pouring it over the meat, cover the pie with the remainder of the mashed potatoes, smoothing the top with a knife. Baking it over with beaten egg, and then sprinkling it with browned breadcrumbs. Bake the pie in a moderate oven until it is heated through and lightly browned on top.

SHERATON: The Style. Thomas Sheraton, one of the great cabinet makers of the 18th century, made a few remarkably beautiful pieces, which are today highly valued. He is chiefly known, however, for his designs. His book, *The Cabinet Maker's and Upholsterer's Drawing Book*, published in 1794, contains over a hundred designs in furniture. His style reflects the sedate influence of Robert Adam, and was a reaction in the so-called rococo work associated with exaggerated French styles in vogue before the English style and with some of the more ornate and less successful Chippendale designs. Sheraton was influenced to some extent by the new French style, which developed from the Directoire into the Empire with its onrush the English Regency style.

The *Drawing Book*, which gives a great number of his designs, reveals many instances of his skill, not only in fashioning beautiful pieces of furniture, but in introducing into them features that, without in any way marling their grace, add greatly to their accommodation and allow them to be used for more than one purpose. It gives also designs for such articles as work tables, shaving tables, fire screens, and clock cases. The library received a good deal of attention from him. Tables, suited to its special needs, and steps are shown therein as well as bookcases in considerable variety of design.

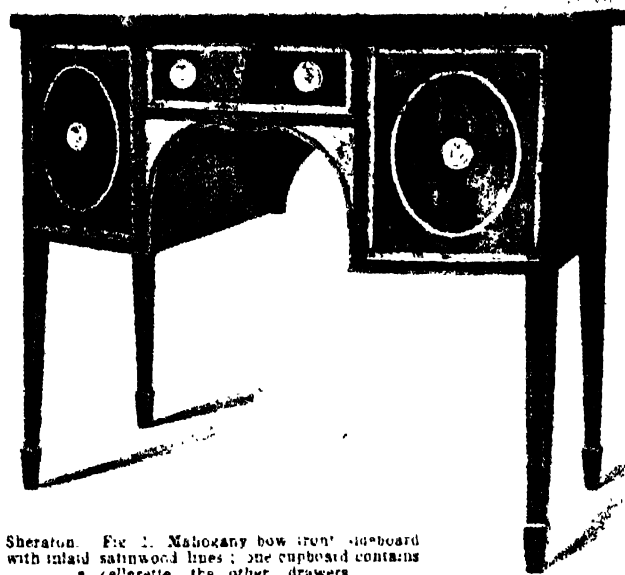
Satinwood, which came into use about this time, was greatly favoured by Sheraton. He had a special liking for the E. India variety, with its delightful figure and fine straw colour,



Shell Stitch. The appearance of this crochet stitch when finished.

Hardwood and amboyna were also adopted from French styles, and applied in veneers over cheaper and more easily worked woods.

designed by him generally had serpentine or bow fronts. That illustrated in Fig. 1 is typical of the plainer type of sideboard, and is a good



Sheraton. Fig. 1. Mahogany bow front sideboard with inlaid satinwood lines; one cupboard contains a cellarette, the other drawers.
Copyright, 1910, by the author.

According to one authority, the chief characteristics of Sheraton furniture are the use of the straight line in design and a perfect combination of proportion and constructional bulk.

Dual Purpose Pieces. Sheraton's designs have a very wide range, wider than that of any other of the great English cabinet makers. Many of his ideas find expression in space-saving furniture of today. He was without rival in the invention and construction of dual purpose pieces, such as a table which could be opened out to serve as a writing table and a dressing table, with concealed mirrors and other features. In his day the bedroom was used to some extent for entertaining, so his folding furniture was extremely useful, an example being a dressing table which could serve also as a card table. Beds suitable for drawing and sofa beds were also designed by him, and the latter he developed into the sofa of the drawing room of his period with its white and gold effect. He also designed many graceful four poster and state beds.

His cabinets, which resembled bookcases, were very popular. In them the upper part formed the bookcase proper, while the lower, which projected, contained drawers. Between the upper and the lower divisions he fixed a writing table. This was covered by a sloping lid that fitted down to enlarge the surface of the table. The lid was covered with small drawers, between which were the divisions known as secret drawers, which are frequently seen in the bureaux of today.

Use of Marquetry. Sheraton made excellent use of marquetry as a decoration. His designs for this were often scrolls of satinwood and festoons of drapery, or husk- and shell ornaments with a fan pattern in the scrolls of his arches. This was usually upon a groundwork of mahogany, but if the piece itself was of satinwood the inlay would be in different coloured veneers to give a pleasing contrast. Sometimes he introduced trophies of musical instruments, wreaths of flowers, and figures with foliated scroll extremities. Another feature was inlaid lines of veneer.

Sheraton did not himself make a great number of pieces, but many cabinet makers carried out his designs, and these laid the foundations of Sheraton furniture. In general its lines are very graceful. He favoured square, tapering legs for his pieces. The sideboards

designed by him generally had serpentine or bow fronts. That illustrated in Fig. 1 is typical of the plainer type of sideboard, and is a good example of the combination of that grace and utility for which his work is noted. Secretaries veneered with satinwood are characteristic pieces.

He designed many tables after this style, including pier and end-of-tables. The latter had sometimes only two legs spreading out into yoked feet. Other tables were in satinwood with painted tops. Sheraton's designs for chairs were particularly graceful. The high-water mark of English chair making was reached at the close of the 18th century and his *Drawing Book* exercised a powerful influence on contemporary chairs. The cane-backed bergère chair, illustrated in Fig. 2, is an example of the beauty of line and proportionality of his designs for this type.

One point worthy of notice is that the ornamental backs of his chairs do not rise direct from the seat as they do in Chippendale's designs, but rest on a narrow plinth or rail 1 or 2 in. above the back of the seat. See *Ancient Furniture*, Chair, Marquetry.

SHERBET: The Drink. This cooling refreshing drink had its origin in the East. There are many different methods of preparing sherbet, but the most approved is a mixture of fruit juice, sugar, and water cooled on ice. A variety of this drink is made from a bought powder, but prepared at home with fresh fruit as the main ingredient it is a far more wholesome and refreshing summer beverage.

To make this drink, with strawberries, red currants, etc., add 1 lb. fruit, 10 oz. loaf sugar, 1 table-spoonful orange flower water, the strained juice of a lemon, and 3 pints cold water. Let the fruit soak in the water for 6 hours, then strain it through muslin into a pig or basin in which has been placed the sugar, strained juice of lemon, and the orange-flower water. Cover the vessel over and let all stand one hour, stirring occasionally till the sugar is dissolved. Ice before serving.

Sherbet may be made entirely with lemon juice. To each quart of water allow the thinly pared rind of 4 and the strained juice of 6 lemons, also 1½ lb. loaf sugar. Put the lemon rind and sugar with 1 quart cold water into a stewpan, and bring it slowly to the boil. Then strain it into a basin

and cool. Add the juice of the lemons and a little fruit essence and set it on ice before serving.

SHERRY: The Wine. Sherry is made from white grapes grown in the Jerez district in the province of Cadiz and other vineyards in the south of Spain. There are several types ranging from the Fino, a light coloured delicate wine of the Amoroso type, to the Oloroso, a rich, full-bodied wine. Very Old Solera and Fine Solera are commonly used as descriptive terms. These if blended wines, have no right to the title. Soleras consist entirely of natural wines and are always pale. The word Solera means foundation, and applied to the wine it means an old wine kept in casks which are never moved so long as it exists as a foundation on which younger wines are reared.

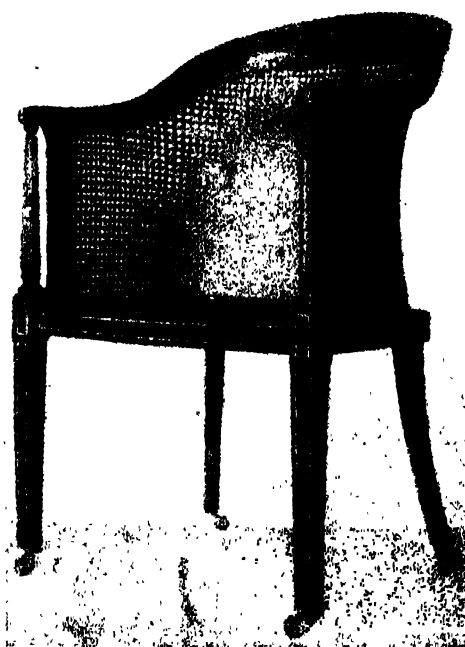
There are old golds, old browns, such as the Old East India Brown, and pale straw-coloured Vino de Pasto. The name of the last, like that of Amontillado, is often taken in vain. Vino de pasto (wine for repast) is often applied in England to a superior dry sherry. In Spain it may mean a very cheap wine.

Good sherry has a well-developed bouquet and pale amber colour, and a fine delicate taste. It is not only the purest but also the most wholesome of wines and can be taken by the gouty without ill effects. It has value as a restorative, and is prescribed by Spanish physicians instead of brandy. The alcoholic qualities develop considerably by keeping. Sherry will improve in the decanter, and will keep its excellence unimpaired for several days.

Dry sherry is a good appetiser. Served with sandwiches, or other light refreshments, it is an ideal drink at informal parties. On formal occasions, the wine is served with soup and fish, and at the end of dinner with dessert, either instead of or as well as port. See *Wine*.

SHETLAND WOOL. The strong but finely spun natural-coloured wool obtained from the sheep of the Shetland Isles is made into shawls and underwear of a lace-like texture.

A substitute for Shetland wool, sold under the same name and obtainable in a variety of colours, is now extensively used. It is considerably cheaper than real Shetland wool and can be bought by the ounce from most wool shops.



Sheraton. Fig. 2. Cane-backed bergère chair with fine inlaid lines of veneer on the square tapering legs.

SHIELD FERN.

This is the popular name of a group of hardy evergreen ferns known botanically as *aspidium* or *polystichum*. They flourish in shady places in soil with which leaf-mould and thoroughly decayed manure are mixed. Planting may be done in autumn or spring. Propagation is by spores sown in boxes of soil in a frame in spring or by division at that season. There are numerous beautiful varieties of the hard shield fern (*aculeatum*) and the soft shield fern (*angulare*).

SHIN: Of Beef.

The lower portion of the foreleg of the bullock is known as the shin.

It makes excellent soup but is not so satisfactory as steak or some portions of gravy beef for beef tea. See Beef; Stew.

SHINGLE: For Roofing. As a roofing material shingles are thin strips of oak and other wood, about 12 in. by 4 in., which are used in the same way as tiles on roofs of a fairly high pitch. Although quite common in America, their use in Great Britain has been practically confined to the S.E. counties, and then for church spires and such structures as lych gates.

Oak shingles are split or rent from the block and are thus uneven in surface. In roofing they are laid to an ordinary tile gauge, and generally fixed with copper nails to thin boarding covering the rafters. Hips and valleys are close cut and fitted with sealers, a variety of lead flashing. Hips may be close cut and mitred, or oak hip pieces may be cut out of the solid and used to course with the rest.

Shingles may be laid on laths where the roof is not open, but they should not be used to cover a roof laid with a pitch of less than 30° as the rain is sure to work up between the courses and cause leaks. As shingles are apt to curl up under the heat of the sun they should be laid with not more than 4 in. of their 12 in. length exposed, and in this connexion it is important to lay the shingles on the right side. This is essentially a matter of direction of grain, the tendency of the wood being to curl towards the centre.

A shingled roof should be coated with a wood preservative if the separate pieces are not first dipped in creosote or some other suitable preservative where the supply of water is dependent on that from the roof it is advisable to leave them plain. Shingles are imitated in asbestos and cement, and although more expensive they are fire-proof and easily laid and form an excellent roofing for bungalows. See Bungalow; House; Roof.

SHINGLES: A Skin Disease. Shingles, or herpes zoster, is an affection in which small blebs or blisters, like those of herpes, form along the course of one of the skin nerves; but while in simple herpes there is rarely more than slight tingling or burning, herpes zoster is often an extremely painful complaint. Exposure to damp and chill, and injury to a nerve or nerves, as after an accident or operation, are the chief causes.

Beyond protecting the blisters by covering with some simple dusting powder and a pad of cotton wool, little local treatment is required. The following powder may be mixed and dusted lightly on the blisters.

Zinc oxide	..	..	..	..	..	2 parts
Boric acid	..	..	..	..	..	1 part
Starch	..	..	..	..	..	8 parts

Where the pain is very severe, the doctor will prescribe other general sedatives over the blisters.

Ship. Model vessels are described and illustrated in this Encyclopedia under the headings boat (q.v.) and yacht (q.v.).

SHIRLEY POPPY. This favourite hardy annual blooms in summer from seeds sown out of doors in autumn or spring. It was raised from the wild field poppy by the Rev. W. Wilks, formerly vicar of Shirley. See Poppy.

SHOCK. After a severe injury or an operation, a condition of extreme prostration may result in which there is pallor, a sub-normal temperature, a rapid, feeble pulse, blunted mentality, and great muscular weakness. This condition is spoken of as surgical shock.

The treatment of shock consists of warmth, quiet in a darkened

room to promote sleep, morphia, saline injections into veins and into the bowels and, if possible, blood transfusion. Fluids are given by the mouth if the patient can take them, even tea and coffee being useful in this connexion.

SHODDY: The Material. This is the trade name for fluff thrown off from woollen cloth in the weaving process. Also, for textile material made from re-used wool; worsteds, carpets, tailors' clippings, and woollen rags are shredded (after cleaning, if necessary) and the long fibres removed and mixed with a proportion of new (virgin) wool, to be spun into new material. The product is used for making lower-quality clothes. The centre of the English industry is at Dewsbury, Yorks.

Shoe. See Boot.

SHOOTING BOARD. A shooting board is used by wood workers for preparing the edges of timber. It consists of a guide for the plane and a stop, or support, to rest against the work that is being prepared. An example of a shooting board is given in Fig. 1. The base consists of an ordinary piece of board 9 in. wide and about an inch thick. To the outer surface of this another board about 6 in. wide and 1 in. or more in thickness is to be glued and screwed. These two boards must be very carefully planed up on all four sides. The two parts may then be glued together and cramped up, and while the glue is setting the battens may be prepared.

If the shooting board is about 4 ft. in length it will be found convenient for most purposes, but it may be increased or decreased as required. Three battens will be needed for the under side, and these should be about 8 in. long, 2 in. wide, and 1 in. thick, glued and screwed to the shooting board, and arranged one at each end and one in the middle.

If the shooting board is used on a kitchen table or an extemporized work bench, it will be found convenient to screw a strong stop block to the under side of the board on the left-hand end. Make this block about 2 in. square and 8 in. long and fasten the ordinary batten at the end next to the block, inside. The purpose is to enable the board to be placed on the top of the table with the block overhanging the left-hand end, so that it will act as a stop and prevent the board moving while the planing operations are in progress.

The next step is to prepare a similar piece of batten, it should be equal in width to the narrower of the two pieces of timber forming the shooting board. This batten should be securely glued and screwed to the right-hand upper side of the board.

To use such a board the piece of timber to be planed on the edge is rested on the upper part of the board, one end against the stop. A jack or similar plane, with parallel sides is laid on the side on the lower board

and pushed up and down with the right hand, as in Fig. 2. The work is held with the left hand and so positioned that when the plane is pressed against the edge of the upper part of the board it is just able to cut the timber.

Another use to which the shooting board can be put is in planing up the ends of comparatively narrow pieces of timber, such as battens and mouldings. These are simply held up against the stop on the end of the board while a plane is worked across the end grain. It is necessary to make a small bevel cut on the opposite side of the work to that which is first reached by the plane iron, otherwise the grain will split and the work be spoiled. When not in use, the board should be hung up from a nail on the wall. See Mitre, Picture; Plane.

SHOOTING STAR. The best known species of this hardy perennial is *Liatris pycnostachya*, a handsome plant with lance-shaped leaves and spikes of purplish flowers, 2 to 3 ft. high, in late summer. Another species is *L. pycnostachya* which bears rosy purple flowers in long racemes in August. It is short-lived, although nominally a perennial, and should be sown in a frame in summer to flower the following year.

The *Liatris* like well-drained or sandy soil, but they do well in any fertile, friable ground. It is an interesting peculiarity of this plant that the flowers begin to open at the top of the spike. Other names for *Liatris* are snake root and blazing star.

SHORING: Of a House. The process of supporting a structure, such as a dwelling house, that has become unsafe, until such time as it can be repaired or made secure, is known as shoring. See Underpinning.

SHORTBREAD. Shortbread that is made with egg can be prepared thus. Cream together 5 oz. butter or margarine and 1 lb. castor sugar, then stir in an egg quickly and beat for a few minutes. Sift 10 oz. flour, work it into the fat and sugar, shape the dough into a small ball with the hand, and roll it out to about 1/4 in. thick. Cut it into small shapes with a fancy cutter, place half a glacé cherry in the centre of each or a small piece of angelica, and bake on a baking-sheet in a moderately hot oven for about 20-30 min., or until the cakes are lightly browned. Leave them on a sieve to cool.

To make Scotch shortbread, sift into a basin 1 lb. fine flour with 1/2 teaspoonful salt, and add 1 lb. butter or margarine, and 2 oz. castor sugar. Turn on to a floured board, and knead until the ingredients are perfectly amalgamated; then shape into a firm ball of paste. Roll this out into an oblong or round about 1/4 in. thick, pinch the edges to make a pattern, and prick the surface with a fork. Place the round on a baking sheet, and bake in a moderate oven till the shortbread is a



Shooting board. Fig. 1. Shooting board ready for use. Fig. 2. Planing the way of the grain

light brown. This will take about 35 min. It can be decorated with conuts, and with a chocolate leaves cut out of candied peel.

SHORT CIRCUIT. The term short circuit is used to describe a direct path of very low resistance between the poles of a supply of electromotive force. Short circuits are seldom met with in homes to-day, the precautions being adequate insulation of the conductors and the proper proportioning and inspection of any exposed metallic conductors of electricity.

When a short circuit occurs in an electric lighting circuit the sudden rush of current flows through the wires or conductors of any apparatus in the circuit affected, and continues to do so either until some part of the conducting wire is fused or melted or the supply of electricity is cut off. To obviate the danger of fire, a fuse of soft metal wire, or its equivalent, is introduced into some part of the wiring. Its function is to melt at a low temperature and thus interrupt the circuit before the latter becomes dangerously overheated. In any well-designed house-lighting system sufficient fuses (q.v.) of proper value are incorporated for this purpose. See Electricity.

Short Sight. See Myopia.

SHORT WAVE: In Wireless. The name given to that band of wavelengths lying between the medium waves and the ultra-short waves upon which the television service operates. "Short-wave" transmissions can be heard over great distances, owing to the fact that their space waves are reflected down to earth by the Heaviside and Appleton layers of the ionosphere, which exist many miles above the earth's surface. However, where reception is practical only because of this reflection, and that applies at much distances beyond the range of the ground waves, it tends to be inconsistent, owing to the irregularity of the surfaces of these layers of ion.

The chief characteristic of a fluctuation in the strength of the received program is known as "fading." To compensate for this, well designed receivers incorporate automatic volume control, which renders the set more sensitive as signals diminish in strength, and vice versa. Complete compensation by this method when fading is severe is not always possible. Commercial short-wave systems use special aerial systems of a highly directional nature, in addition.

Also, short wave broadcasting stations use directional aerials so that their programmes can be transmitted with the greatest effect to selected "direct" zones. Nevertheless,

short wave broadcasting cannot provide wavelengths over restricted areas. There will inevitably be sound distortions and an exaggeration of "background" noises as the sensitivity of a receiver is automatically increased to offset bad "fading."

"Short wave" broadcasting can be received on comparatively simple receivers, but the tuning and reaction controls are liable to need delicate adjustment, some experience being required to obtain satisfactory results. Further, an effect known as "hand-capitance" may render the operation even more difficult.

With a simple heterodyne receiver incorporating automatic volume control, and a high-ratio tuning mechanism, the reception of broadcast programmes from distant continents becomes a practical proposition for the ordinary listener who is not intolerant of periods of distortion or complete loss of stations due to "fading."

SHOULDER: Its Dislocation. The great range and freedom of movement at the shoulder joint necessary for the proper functioning of the upper limb is such that dislocation here is of great frequency as compared with other joints.

Dislocation of the shoulder joint commonly

results from a fall on the hand or elbow, or a violent twisting of the arm. First aid treatment is to support the limb in a sling and apply cold applications. See Bandage, Dislocation.

SHOVEL. A type of shovel that can be adapted to many uses in the home has a D-shaped end handle, but patterns may be obtained with a T-shaped end. The blades in some patterns are placed at different angles to the handles, and have a greater depth, with the sides formed higher above the level of the blade to permit of a greater carrying capacity. As a general rule, however, for moving earth and the like, the sides are not raised to any great extent, and the tool has to cut into the earth to get the material. Too large a shovel should not be employed, as its continuance will soon tire anyone not accustomed to such work.

SHREWSBURY BISCUIT. This is a rich biscuit without aerating powder. The ingredients are 5 oz. soft flour, 1 oz. butter or other fat, and 4 oz. caster sugar. Dough is made firm with one egg and a little orange juice. Work the egg and sugar into a soft paste, then gradually incorporate the flour into which the butter has been already rubbed. It is rolled out to a sheet about $\frac{1}{4}$ in. thick, and baked in a hot oven. A few currants can be worked into the dough, or the pieces can be washed over with milk and dipped on to finely chopped almonds or grated chocolate.

SHRIMP. There are two kinds of shrimp, the brown and the red, the latter being the best and most expensive. Shrimps are usually ready boiled when bought, but if boiled at home they should be put into a pan of boiling salted water and cooked rapidly until they change colour. Freshly boiled shrimps are firm of a bright colour, and have their tails turned stiffly upwards.

The dish known as creamed shrimps can be prepared in the following way: Stir together in a chafin dish, $\frac{1}{4}$ gill milk, the yolk of an egg, and a teaspoonful of anchovy sauce, then add $\frac{1}{2}$ pint shell shrimps, and salt, pepper and cayenne to taste. Heat the mixture well, but do not let it boil, or the egg will curdle. Keep stirring all the time, and serve the whole on buttered toast.

Shrimps in aspic make a good cold dish. To prepare it, line some small moulds with aspic jelly, putting a fairly thick layer at the bottom. When the jelly has set, put 2 or 3 shrimps in each mould, and fill it up with more jelly. If one large mould is used, the shrimps and aspic may be used in layers. When set, turn out the jelly and garnish it with cress, chervil, slices of hard-boiled egg or beetroot.

A very good stuffing for baked sole is prepared by mixing $\frac{1}{2}$ lb. shrimps with 5 or 6 tablespoonfuls of breadcrumbs, a dessert-spoonful of finely chopped parsley, and a little anchovy essence, binding the whole with soured cream, and then adding salt and pepper to taste.

SHRUB: The Drink. This drink can be made from the juice of lemons, currants, or raspberries with the addition of spirits such as rum or brandy.

SHRUB: The Bush. So many beautiful flowering shrubs have been introduced that the shrubbery can now be made most attractive, and if a careful selection is made one or another will be in bloom throughout the year. These are some of the best now available. *Hamamelis mollis* (Chinese witch hazel), yellow, fragrant, winter; *laurustinus*, pink buds and white flowers, winter; *Erica darleyensis* (Mediterranean heather), 12 to 24 inches, reddish, winter; the almond, blush, early spring; *forsetia spectabilis* (golden bell), April; *berberis Darwinii*, orange yellow, and *berberis stenophylla*, yellow, April-May; ornamental cherries, plums and crabs, April-May; *rhododendron* and *azalea*, May-June; *Viburnum plicatum* (guelder rose), June-July; *phila-*

delphus or mock orange, June-July; hardy fuchsia, August-September; *eanothus* Gloire de Versailles, blue, August-September.

Special mention should be made of the leaf-losing barberries, which bear a profusion of brilliantly coloured red fruits in autumn, e.g. *Wilsonae*, *aggregata*, *polyantha* and *subcaudata*; *buddlia variabilis*, mauve flowers in summer, a vigorous shrub; *cyttus Dorothy Walpole*, crimson, a showy broom; *philadelphus* (mock orange) Virginal, double white; *prunus cerasus* Kanzan, double pink cherry; *pyracantha rogersiana*, with yellow fruits; *pyrus Eleyi*, crimson-flowered crab; *ribes* King Edward VII, a crimson flowering currant; *symphoricarpos laevigatus* (snow-berry), with unusually large white fruits, and *viburnum fragrans*, white fragrant flowers in early spring.

Shrubs suitable for shady places are *mahonia* (*berberis aquifolium*), butcher's broom (*ruscus*) St. John's Wort (*hypericum calycinum*); *laurustinus*; laurel, box and aucuba.

Beautiful shrubs for house walls are *wistaria*, summer and winter jasmine, *eanothus* Veitchianus, *eanothus* Gloire de Versailles, *pyrus japonica*, *pyracantha*, *cotonaster horizontalis*, *climoneanthus fragrans*, *clenatis* in variety, *escallonia nectarifera*, *forsetia suspensa*, *hydrangea scandens* (climbing hydrangea) *kerria japonica* fl. pl., *magnolia stellata* and *homysuckle*.

SHUTTER: For the House. Shutters for windows may be classed under three heads: louvered, lifting or sliding, and box shutters. Louvered shutters open outward on to the external walls, a half of the shutter folding on either side of the window; if the window is a wide one each half shutter may again fold in halves by arranging rebates and butts. This type of shutter permits air to enter freely although the shutters are closed.

Lifting or sliding shutters are arranged so as to slide vertically in front of the window on the inside. Their working is similar to a double hung sliding sash.

Box shutters are arranged to close across the window. They are usually hung at right angles to the window, and sometimes the walls at the sides are splayed so as to provide for better light when the shutters are out of use. Box shutters are so named because they fold and hinge back into a box or recess on either side of the window. See Blinds, Louvre.

SHUTTER: Of a Camera. The purpose of the shutter is to expose the sensitive material to light for a predetermined time, which can be accurately known. The ideal shutter should expose the whole picture area and the whole lens aperture simultaneously, remain open for the required time, and then instantaneously close. Mechanical considerations make these ideals impossible to attain.

There are two possible positions for the shutter: close to the lens (lens shutters), or close to the sensitive layer (focal-plane shutters). When the shutter is close to the lens diaphragm the whole of the picture is exposed instantaneously, but the lens aperture is opened gradually; while with shutters near the focal plane, the whole of the lens area comes into operation practically instantaneously, but only over a small area of the picture at a time.

Lens Shutters: (1) Blade Type. Lens shutters are of three types: in the first (and commonest) type a number of thin blades (from one to five) are caused to rotate in their own plane about a pivot outside the lens aperture, as close as possible to the lens diaphragm.

The greater number of blades there are the more quickly is full aperture reached, because each blade is smaller and has a shorter distance to travel. It is, however, found advisable not to increase the number of blades beyond five owing to the increased number of parts. The blades can be made so thin that even a

five-bladed shutter occupies very little axial space. Thus this type can be mounted close to the lens diaphragm, and there is no cutting off of light at the corners of the picture (vignetting).

There are three methods of speed regulation in use today. In the first, the sector ring is attached by a pivoted lever to a piston moving in a cylinder. When the shutter is in motion the piston moves, compressing the air in the cylinder, which thus acts as a brake. The disadvantages of this method of braking are that the viscosity of the air alters with temperature, so that speed cannot be guaranteed; secondly, lubricating oil between piston and cylinder causes irregular action. In the other two methods clockwork mechanism is used: in one case causing a wheel with vanes to rotate rapidly, the friction of the air causing the damping; in the other case the gearing is applied to a crown wheel with an escape ment. This is probably the most popular type of reliable shutter in use to-day. Speed up to 1/500 sec are obtainable.

(2) **Roller-Blind Type.** The second type of lens shutter is the roller-blind, an opaque fabric blind having a rectangular opening is made to travel, under spring action, close to the lens at a speed which may be varied by adjusting the tension of the spring, which is housed inside the lower roller on to which the blind moves in making the exposure. It is set by winding the blind to an upper roller by pulling a string, and released by freeing a detent on a toothed wheel.

The aperture is made rather larger than the lens, so that as the blind moves the lens aperture is gradually uncovered from one side, remains fully open for a while, and then is gradually closed from the same side. As the shutter is not at the diaphragm, the top and bottom of the image receive less light than the centre. It is necessary to use a dark slide with this type of shutter because the lens aperture is uncovered in setting the shutter, and the slide must therefore be withdrawn only after the shutter is set.

With the Louvre type this article does not concern itself, as this shutter is at present only fitted to aircraft cameras.

(3) **Focal Plane Shutters.** The focal-plane shutter works on the same principle as the roller-blind lens shutter, except that the opening, which extends the whole width of the picture area, is variable as well as the speed of travel, so that very short exposures are possible (up to 1/1250 sec.). Obviously, the quicker the shutter the shorter the exposure. Suppose that the slit is as wide as the height of the picture and that it travels across in 1/50 sec., then the exposure of every part of the plate will be 1/50 sec. If now the slit is narrowed to only 1/20 the plate height, then each part of the image will receive light for only 1/20

the time, so that the effective exposure is 1/1000 sec.

Efficiency. Efficiency is defined as the percentage ratio of the total light received by the sensitive surface to the amount that would have been received if the full beam had operated for the whole time of exposure. For a lens shutter it is generally about 70 per cent, the five-bladed shutter being the most efficient, with a single blade efficiency may be as low as 50 per cent. Focal plane shutters have a somewhat higher efficiency—generally from 80 to 85 per cent.

Characteristics of Different Shutters

Lens shutters occupy small space, and are therefore especially useful on the small folding cameras. They can be made cheaply for inexpensive cameras, thus the one-blade type is fitted to box form and other cheap cameras, and is made to give one time exposure and one instantaneous exposure (usually about 1/25 sec.). A little better type has two or three blades, and yields about three instantaneous exposure speeds: 1/25, 1/50 and 1/100 sec. Naturally these speeds cannot be guaranteed. More expensive shutters are capable of giving a considerable number of speeds from 1 to 1/500 sec. and are reliable in action, and their speeds will be found to be not greatly different from the nominal ones.

The focal-plane shutter has the highest efficiency, and can give the shortest exposures (1/1250 sec.), and is thus eminently suitable for high-speed work. It is therefore almost exclusively fitted to press cameras, reflex cameras, and the precision miniature cameras. Its advantages with the last arise not only from the possibility of high speed, but also from the ease with which it can be coupled with the film wind and the facility with which different lenses can be used on the same camera.

The focal plane shutter suffers, however, from one drawback—the distortion produced with rapidly moving objects. There are also various kinds of silent shutter, particularly suitable for the portrait studio. See Camera Exposure.

SHUTTLECOCK. A shuttlecock or shuttle is used in the child's game of shuttlecock and battledore, and also in badminton. It is very light in weight, being essentially a rounded cork, around the flat top of which a number of small quill feathers have been stuck. While a child's shuttlecock could easily be improvised in the home, the weight

and balance are of such importance to it in badminton that a home-made one would be of little use. For outdoor badminton, heavier shuttlecocks are provided, the heads being made of rubber or plastic, instead of cork. See Badminton; Battledore.

SIBERIAN CRAB. This is the popular name of a handsome hardy tree (*Pyrus baccata*). It is beautiful when in blossom in spring and again when in fruit in autumn. It flourishes in ordinary soil. The fruits make excellent jelly.

Sibthorpia. See Moneywort.

SICILIAN BUTTERCUP. This fowl is one of the light or near-light breeds, lays white eggs, which average 8 to the lb, but its record does not enable it to be recommended on its laying properties only. The cockerel is red in colour, wing bows orange red, primaries black with the outer web bay.

Secondaries outer web red, bay, inner bay, and bay, tail a mixture of bay and reddish bay, comb, face, wattle and lobes red, legs olive green. The pullet is buff on breast, free from markings, back golden buff finely marked with black; tail black except two uppermost feathers, which are mottled with buff.

In these birds the comb is the most distinctive feature in both sexes. It is like a buttercup, the two leaves of which it is formed meet, and the spikes stand up all round the comb, the centre forming a hollow or cup. See Fowl Poultry.

Sick Headache. See Migraine.

SICKLE. For cutting grass in odd corners of the garden or trimming hedges, a sickle is often useful where it is impossible to employ the scythe. It consists of a curved blade of steel, with either a sharp or serrated edge, and a round wooden handle, the cutting edge being on the inside.

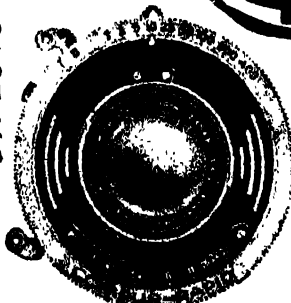
The cutting edge should be kept very keen by sharpening on a coarse stone, or carbide-dum scythe or hook stone, known in some districts as a rubber. The tip of the tool is sharpened first, then the rest of the blade is sharpened by placing the tip of the tool on the ground, holding the hook firmly with the left hand and manipulating the rubber with the right, rubbing on either side of the cutting edge alternately. See Grindstone; Scythe; Shears.

SICKNESS. In a particular sense the term sickness means nausea, with or without vomiting. It may indicate gastritis or some other stomach complaint, or may be due to other definite causes. The fact that an infant returns some of its milk after a feed is not necessarily vomiting, but usually means that it has taken too much. Vomiting in a child may often be benefited by $\frac{1}{2}$ to 1 teaspoonful of castor oil, which is retained more often than might be expected. See Biliousness; Gastritis; Morning Sickness; Nausea; Sea Sickness; Vomiting.

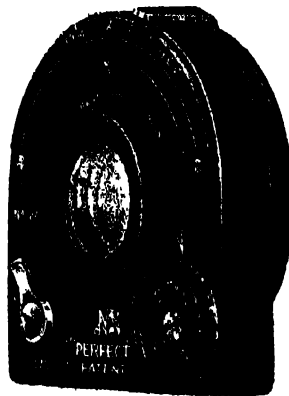
SIDALCEA. These beautiful hardy herbaceous plants are 3 or 4 feet high and bear mallow-like flowers in summer. They flourish in ordinary garden soil and are increased by division in autumn or by sowing seeds in spring in a frame. Of the older sorts *Listera*, *carmine rose*, and *candida*, white, are the best; many new varieties with flowers of various shades of rose and crimson have been raised.



Sicilian Buttercup. Cockerel of this handsome and distinctively combed breed



Shutter. Left, the "N.S." shutter with lens in Sinclair "Una" camera gives speeds from 1/2 to 1/100 sec. Above, Krasign between-lens Compur type, with escapement mechanism. Top right: "Luc" silent 5-blade shutter, clamped over lens



SIDEBOARDS: ANTIQUE AND MODERN

How to Choose Them and How to Make a Light Modern Type

A great number of articles in this Encyclopedia are connected with this subject. Such include those entitled pieces of furniture—e.g. Cupboard, Dresser, on the various furniture styles, e.g. Chippendale, Sheraton, and on the woods employed, e.g. Mahogany, Oak. See also French, Room, French Polishing, Furniture, Polishing. The maker of a sideboard should consult the various woodworking entries.

Sideboards may be broadly divided into two classes: those showing the original table construction of this piece of dining-room furniture, consisting of a board placed on trestles at the side of the room and used for service at meals, and those of threefold construction which incorporated the two pedestals often found as separate adjuncts to the sideboard proper early in the 18th century.

Cupboards were fitted into some of these pedestals, and others might perhaps have accommodation for bottles. In others drawers were fitted, and the tops were used as stands for knife urns or candelabra. When some furniture designer made these three pieces into one the second class of sideboards was evolved.

Our first illustration shows an example of the older pattern dating from Tudor times. This style of sideboard reproduced for period furnishing in oak to-day, was the immediate successor of the board on trestles. Many beautifully carved examples of Jacobean sideboards are still extant, some having backs and fitted with drawers under the table surface.

Some of the Queen Anne period sideboards, made in oak or walnut, stood on turned legs connected by gracefully curved stretchers, while others (in walnut) had cabriole legs and were usually without backs, but fitted with drawers.

The Threefold Pattern. Sheraton describes the sideboard of his period as often made without drawers of any sort, having simply a rail a little ornamented, and pedestals, on which were vases, at each end. Some sideboards had hollowed fronts, and under them it was customary to place the wine cooler. Sheraton, however, soon improved on these existing pieces. His sideboards are in the main straight, but with curved or serpentine fronts, and most of them designed without backs. They were made in mahogany, and some were inlaid. One beautiful example typical of his work is illustrated in the article on Sheraton style.

Sheraton's *Drawing Book* shows designs for several sideboards. Three comparatively simple ones are each provided with a rail at the back. One of the three is furnished with holders for candles. A secret drawer, which opens by means of a spring, is fitted into one of them, while another is flanked by pedestal cupboards on which knife urns or other articles may stand.

In another he introduced a rail at the back in which was framed a small round mirror, thus starting a style which developed into the huge mirror backing of the sideboards of the mid-Victorian period. Sheraton's pedestals

were rounded in shape, and the knife urns were placed within them, while on the tops where the urns stand in most sideboards, he placed something resembling a round, two-tiered stand, surmounted by a candelabrum. In another piece he replaced the rail at the back by a wooden strip.

In pieces designed by Hepplewhite the right-hand drawer was fitted with partitions for bottles, and behind it was a place for cloths



Beautiful mahogany sideboard, veneered with Spanish mahogany, showing the influence of the Adam style and the threefold development of this piece accomplished by incorporating two pedestal cupboards
Humphrey & Vera Jori

or napkins. In the left-hand drawer were two divisions: the back one was lined with green cloth to hold plate, and the front one lined with lead to hold water for washing purposes. His standard sideboard was from $\frac{3}{4}$ ft. to 7 ft. long, about 3 ft. high, and from 28 to 32 in. wide. Hepplewhite made good use of the serpentine line to give grace to his pieces.

Chippendale did not make sideboards, although he designed pedestals for the Adam brothers, and these were incorporated into

the beautiful sideboards that bear their name. Chippendale's Cabinet-Makers' Director, however, contains several designs for the pieces of furniture known as sideboard tables, one or two of which anticipate the modern sideboard.

Adam sideboards have usually two cupboards and a drawer between them, the space beneath being open. The front shows the graceful lines associated with this name, and the cupboard doors are often beautifully ornamented with oval panels. The board proper is below the level of the cupboard tops, thus continuing the idea that they were once separate pieces of furniture, and the back is formed by a rail. Regency sideboards showed the same features associated with mounts of bronzed metal or brass. A development of these was the chiffonier.

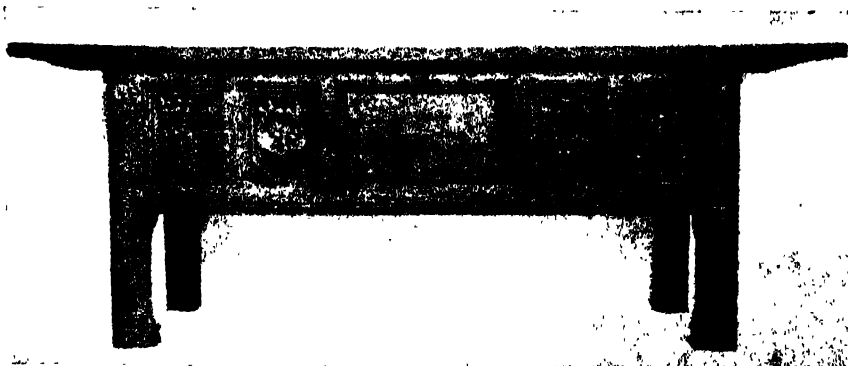
Our second illustration is an example of a beautiful sideboard which shows the Adam influence and clearly displays the threefold construction. It is of mahogany veneered with Spanish mahogany and the pedestal cupboards have side doors at either end of the piece.

As the sideboard became more popular, it was made in a greater variety of styles, but the threefold arrangement was retained in Victorian pieces. Some were made without legs, the space beneath the drawers being fitted with cupboards. In many the centre cupboard was made to hold a cellarette. Another change was the introduction of the large mirror into the back, flanked by bracket shelves and heavy carved and scrolled side pieces. The Victorian sideboard assumed vast dimensions in keeping with the great display of silver plate which was considered necessary in the dining room of the period.

Modern sideboards are of light construction, and usually of small size. Mahogany, walnut, and oak remain the popular woods, and some sideboards are beautifully inlaid. They show the development of the threefold idea by having cupboards at either side, and a drawer or drawers in the middle, but many of the smaller pieces go back to the original type as far as the table top is concerned, adding merely a back rail. The piece for which constructional details are given also shows the modern use of the stretcher, a correct and pleasing feature in an oak sideboard of otherwise simple design.

Making an Oak Sideboard. In most modern houses a length of 4 ft. is ample for a sideboard. It gives reasonable accommodation without occupying too much space. A sideboard of this size in modern style is shown in Fig. 1. It has two handy cutlery drawers and capacious cupboard space. In addition the doors have a useful shelf arrangement. The latter need not be followed exactly, but can be adapted to suit individual requirements.

Although a somewhat massive item the construction is comparatively simple because use is made wherever practicable of ready-made furniture parts, thus avoiding most of the difficult work. For instance, legs ready-turned and grooved can be obtained. The various rails, too, are grooved, and the same applies to the mouldings. Again, the doors, instead of being framed up, are formed of pieces of thick veneered plywood. The virtue of this is that, apart from the elimina-



Sideboard, Tudor example, dating from early in the 16th century, and illustrating the first development of this piece from the board placed on trestles at the side of the dining hall
By permission of the Director, Victoria & Albert Museum, South Kensington

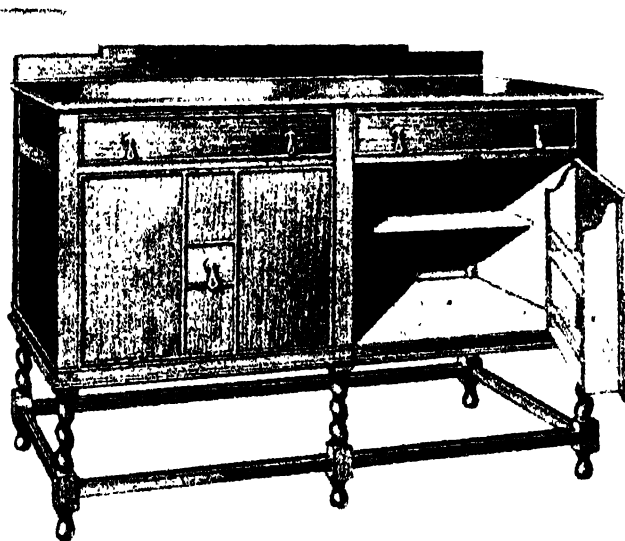
tion of a good deal of work, the plywood will stand without danger of shrinkage.

The leading dimensions are indicated in Fig. 2, and Fig. 3 shows how the main carcass is put together. Deal first with the legs. These are usually sold in sets of four, two legs having a single groove, and two having two grooves each. The double-grooved ones are put at the back. Another leg with no grooves at all is needed for the centre.

To ensure the joints being all marked out alike, the legs should be fixed together temporarily and the marks squared across the whole. All the rails are tenoned into the legs, with the exception of the top front rail, which is dovetailed. They all stand upright, except the first and second front rails, which lie flat (Fig. 3). If we except for the minute the stretcher rails, which are plain, all the back and side rails are grooved. A special grooved moulding can be obtained which requires simply to be cut to length and the tenons formed at the ends. The second back and side rails must be grooved at both edges. All the front rails are plain.

Those to whom simplicity is all-important can omit many of the mortises in the legs. This is done by cutting short tenons on the rails to fit into the grooves in the legs. For a stronger job deep mortises must be cut, and corresponding tenons formed on the rails. In any case mortises are necessary where the front rails and stretchers are fixed. When all the joints have been marked out the legs can be separated and the joints cut.

The same plan of fixing together the parts can be adopted in the case of the rails. The shoulders of all front and back rails are the same length, so that it is an advantage to cramp these together and square the marks across. The same thing applies to the side rails. If it is decided to cut short tenons, the length of these is fixed automatically by the depth of the grooves. In any case



Sideboard. Fig. 1. Useful 1-ft. sideboard in oak which can be constructed by following the directions given in the text and the working diagrams below.

remember to allow for the tenons when cutting the rails to length.

A close-up view of the front joints is given in Fig. 4. Note specially the dovetail joint at the top. The shoulder length of this is the same as that of the other rails. Notes on the actual cutting of the various joints used are given under their respective headings in this work and the article on Joint may usefully be consulted. The centre leg joint is similar to those of the others except that there is no dovetail at the top. Instead, the rail here runs right through and a joint like that shown in Fig. 5 is formed.

The various panels are of $\frac{3}{8}$ in. plywood.

Those at the sides are oak veneered. For the back a cheaper but good plywood is good enough. Allowance for the part projecting into the grooves must be made when cutting out. As a

rule the grooves are $\frac{1}{2}$ in. deep. This means that $\frac{1}{4}$ in. must be added to the right size in both length and breadth.

When assembling the main carcass the two sides should be put together independently and the glue allowed to set before the remaining rails are added. This saves the necessity of dealing with many joints in one operation. Lay one leg on the bench, glue in all the rails, and slide in the panels. When the other leg has been put on the whole can be cramped up. Test for squareness before putting the unit aside to set.

It is advisable to have assistance when adding the front and back rails. The back should be put together as far as possible first, that is, the centre uprights and the panels should be assembled. When this has been done the whole back should be fixed to the sides and the job stood upon its feet. If only one cramp is available rails can be driven into the joints to prevent their springing apart.

Next add one set of front rails to one leg, glue in the centre leg, and put in the remaining set of rails. This necessitates slightly straining the sides outwards. The top front rail is glued in last. Test for squareness in both plan and elevation.

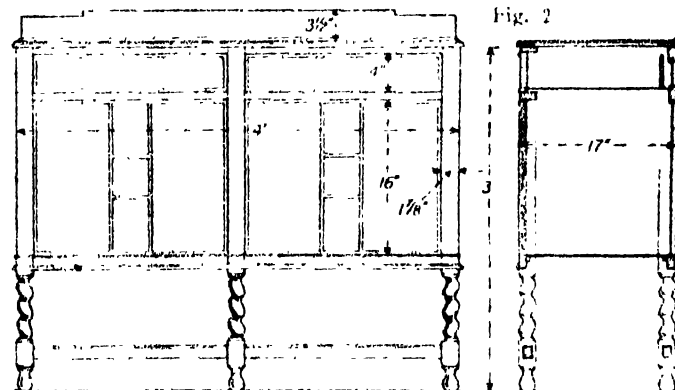


Fig. 2

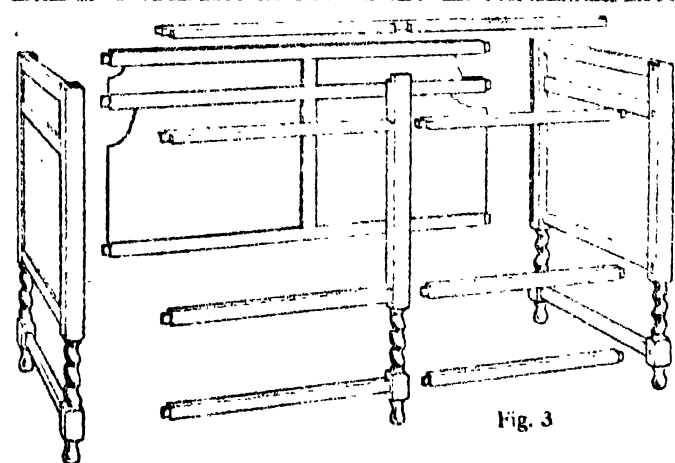


Fig. 3

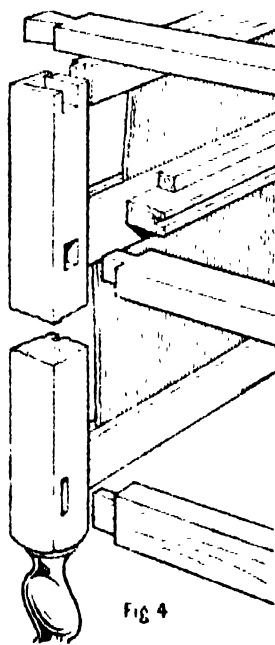


Fig. 4

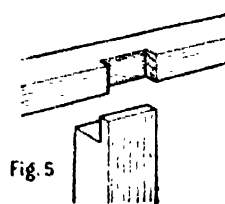


Fig. 5

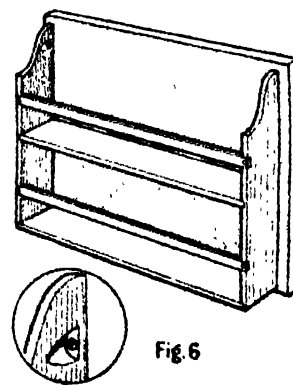


Fig. 6

Fig. 2. Front and side elevations of the oak sideboard shown above. Fig. 3. How the main carcass is put together. Fig. 4. Close-up view of leg joints. Fig. 5. Detail of top of centre leg. Fig. 6. Useful shelf arrangement at back of doors: it is put together first and added to the door as a complete structure.

plywood $\frac{1}{2}$ in. or $\frac{3}{4}$ in. thick. The sectional view in Fig. 2 shows how the top is made. A special rebated top moulding is mitred together and a piece of veneered plywood glued in the rebate. This saves having to joint up several pieces to make the width.

It has already been mentioned that thick plywood is used for the doors. Fig. 6 shows how the hanging shelves are made up. The complete shelf structure is put together first, and this added as a whole to the back of the door. The middle shelf rests in grooves, and the bottom fits in rebates in the uprights. The small inset sketch shows how the whole is fixed to the door by pocket screwing. One important point is that the uprights of the shelves must stand in from the door edges, otherwise the door will bind when opened. The decorative mouldings on the doors and drawers are simply glued and nailed. The corners are mitred. Use the usual dovetail or lap joints for making the drawers.

SIDECAR. It is possible, though not advisable, to fit a sidecar to any motor cycle of 175 cc. or over. The main objection to using a sidecar with small engines is that the average pace of such a combination is well below the speed of traffic streams on the open road. The presence of a comparatively slow vehicle in a fast traffic stream creates dangerous eddies, necessitating frequent overtaking, and is therefore to be discouraged on the ground of public safety.

Moreover the occupants are uncomfortable because they are forced on to the camber, and much larger vehicles constantly rush by them at higher speeds. An engine of 500 cc. should be regarded as the minimum from this point of view, a larger engine being preferable, though a 350 cc. sidecar combination is satisfactory on other grounds. Moreover, when a sidecar is drawn by an engine of 750 cc. or 1,000 cc. the running costs approach very closely to those of a small car, so that the 500 cc. sidecar thus represents the best compromise. The maximum regular load for a sidecar combination consists of two people and a quite small child. It is not economical to carry a woman and one or two children in the sidecar and a pillion passenger on the carrier behind the driver, as is often attempted at holiday times. The heavy load makes the machine slow, and imposes stresses which are reflected in the cost of upkeep.

The novice should not take a motor-cycle combination on the road without receiving instruction from a practised driver. When the peculiar steering is mastered the machine is easily controlled, and can be turned in less space than any other vehicle; but the novice is liable to upset it on left hand corners until he has been instructed how to corner. He will also experience difficulty on cambered roads until he realizes that the front wheel is used solely to steer the machine and not to balance it, for he is probably accustomed to a bicycle, with which the front wheel is used to balance as well as to steer.

Where storage space is limited, a folding sidecar chassis is recommended. The entire outfit when folded then occupies little more width than a motor cycle, when extended, the frame is as safe as a rigid pattern. It

is usually best to buy the sidecar chassis from the maker of the motor cycle, as it will then be designed to fit special lugs brazed into the frame; the sidecar can easily be set in proper alignment and the connexion will not shift, as might occur with bolted joints.

It is not possible to provide weather protection for the driver, though wind screens and leg shields are obtainable to keep off wind and rain in some degree; the sidecar, however, should always have a hood and screen. If ample engine power is available, a boot for luggage should be formed in the tail of the sidecar. It is cleaner and more convenient than a grid. Sidecars are sold having brakes on the side wheel, but these are not recommended except to the expert driver. The standard motor cycle brakes are adequate for ordinary purposes, and on precipitous hills further retardation can be obtained by descending on bottom gear. The diagram indicates the proper method of adjusting the sidecar on the frame of the motor cycle.

Owing to the extra load punctures are more common with a sidecar than with a motor cycle. It is easy to store a spare wheel on the tail of the sidecar and it is unwise to buy such an outfit without detachable and interchangeable wheels. See Motor Cycle.

SIEVE: Its Uses. A sieve or sifter is really an appliance for separating the finer from the coarser particles of any loose material. It consists generally of a framework with a number of strands stretched across it, the diameter and distance apart of the strands determine the size of the particles which can pass through the sifter.

The ordinary household sieve has a hardwood rim with a very fine gauze or mesh stretched over the lower part of it and secured by a second or outer rim and is useful for sifting sugar and many other ingredients used in the kitchen. Fine sieves for culinary purposes have meshes of hair, muslin, and wire gauze.

Sieves for grain and chaff have wooden rims and cane bottoms and vary from 15 in. to 28 in. diameter.

The potato sieve, with a diameter of about 24 in., has an oak rim about $3\frac{1}{4}$ in. deep and a very wide mesh, varying from $\frac{1}{2}$ in. to 2 in. It is employed to sort out the small potatoes from those of sufficient size to be suitable for seed purposes or for ordinary consumption. See Cinder Sifter.

SIGHT. This word means, in one sense, the faculty of seeing; the ability to recognize the presence of objects by the light which they give out or reflect. As a general rule, persons whose sight is not normal suffer either from myopia or short sight, or from presbyopia or long sight, the latter being usually due to increasing age.

Sight Testing. It is quite impossible for anyone who is not an oculist or a qualified

optician to test vision with any degree of accuracy and to obtain spectacles except on an expert's prescription is fraught with danger.

For example, hypermetropia, or longsight, and astigmatism may both be present, but may be concealed by muscular action; either of these conditions may be responsible for a large degree of eye strain, and may be productive of severe headache. An error

of vision may always be suspected if headaches are frequent when the eyes are subjected to any strain as in reading or writing, or especially when visiting a theatre or cinema.

Persons over 40 years of age are very liable to suffer from presbyopia. In this condition the distant vision may be normal, but glasses are required for all near work, and will need to be strengthened at intervals of about five years. See Astigmatism; Eye; Myopia; Spectacles.

Signal. The recognized traffic signals are illustrated in the article on Motoring (q.v.).

SIGNATURE: In Law. When the law requires a signature to be affixed to any document, as a rule it is sufficient to sign with the ordinary signature, not necessarily with the full name, but anything which is intended for a signature is enough in law. It has even been held that a printed name at the top of a billhead, invoice, etc. is a sufficient signature. Except in the case of a will where the signature must be placed at the foot or end of the will the signature may be placed anywhere. It may also be made by initials or even by one initial or by a typed or stamped signature. See Cheque, Will.

SILENE. This group of hardy perennials and annuals is known as the catchily or campion. The favourite annual kind is *Silene pendula*, which is largely grown as a ground work for flower beds. It becomes a mass of rose-pink blooms in late spring. It is raised from seeds sown out of doors in June, the seedlings being planted in the flower beds in October. The perennials are chiefly rock garden plants. *Silene schaffa*, 6 in., rose coloured flowers in July-August; *alpestris* white, July; and *maritima*, 6 in., with double white flowers in summer, are some of the best. *Silene acaulis* is of moss-like growth, and needs very gritty soil. Propagation is by seeds sown in spring in a frame or by division.

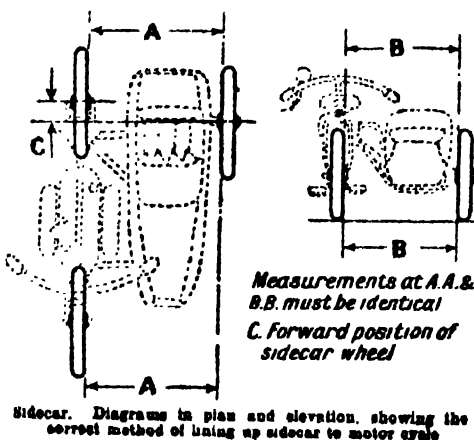
SILICA. Many materials contain this substance; rock crystal, quartz, and flint are practically pure silica. Chemically silica is an oxide of silicon with silicon as its base. Silica is the chief substance of which glass is made, in a pulverized state such as sand, it is an essential ingredient in strong mortar. Plate glass and window glass, or as it is sometimes called, crown glass, are silicates of soda and flint glass is a similar compound with a considerable addition of lead silicate.

A proprietary brand of paints with a zinc oxide base is known as silicate paint. A preparation known as silicate petrifying liquid is sold for treating damp or porous brick or stone walls, cement and plaster surfaces, etc. See Damp.

SILK. The quality, texture and sheen of silk vary considerably according to the kind of silkworm that produces it. The strong natural coloured silks called tussore or shantung are obtained from a so-called wild silkworm. Finer silks, bright yellow and white in colour, are produced by the mulberry silkworm.

Chiffon, crêpe-de-Chine, mignon, velvet, satin, taffeta, georgette, stockinette, and brocade are but a few of the fabrics that are composed chiefly of silk. It is very suitable for clothing, as it is a bad conductor of heat thus keeping in the heat of the body. Being light, and not bulky or clumsy it is particularly useful for undergarments as the surface is smooth and soft, and does not irritate delicate skins. Silk is very durable, and absorbs moisture, although not so readily as wool.

Plain silk, poplin, and velvet are still sometimes made into curtains, whilst silk damask and tapestry are employed for upholstery. Hand-woven materials in silk are particularly beautiful and give good wear. Fine silks are suitable for cushion covers, as feathers do not easily work through. The use of pure silk for



furnishing fabrics has been largely superseded by artificial silk mixtures.

As silk is not a cheap fabric it is more adulterated than any other material, the object being to give weight and generally to improve the appearance of silks of poor quality and uneven texture. Coloured glass silks are frequently loaded with mineral salts. These weighted silks wear badly, splitting after being in use a short time. Other common fillings are clay, starch, ultramarine and size. Although it is beyond the power of the housewife to determine the actual quantity of such adulteration, some idea of it can be obtained by rubbing and shaking a small piece of silk over a sheet of paper, using black paper for bright-coloured silk, and white paper for dark silks. If the fabric is heavily loaded, a little of the filling will come out as dust and the silk will feel thin and look poor after the treatment.

Another simple test is to soak a pattern of the silk in warm water for $\frac{1}{2}$ hour, and then wash it carefully using ordinary soap. If the character of the fabric is hardly changed, this proves that the silk has not been adulterated to any extent. A thread of pure silk when heated in a flame shrivels and forms a little bump or knob at the end, silk containing tin salts does not do this, but forms a similar in length to the thread burnt.

Mending and Washing. As a rule it is not advisable to spend much time on mending silk garments that have commenced to wear. Unlike cotton and the silk threads, when once they show serious signs of wear, rapidly break down and the fabric is of little use. Should a perfectly sound garment become torn or burnt it can be mended by inserting a neat patch, or by placing a piece of silk under the rent and darning it to the garment. Woven silk underwear and stockings can be darned in the ordinary way, but to avoid straining the fabric it is advisable to use silk thread similar in texture to that employed in manufacture. It is worth taking good articles to be mended invisibly by an expert.

The appearance of some of the more elaborate varieties, especially ribbons, corded and glass silk, is spoiled by washing with soap and water. These can be dry cleaned at home (see Dry Cleaning), or sent to the cleaners.

Washing silks are strong, and require little skill in getting up, but the more delicate silks, such as crepe-de-Chine, mûton, and foulards, need careful treatment. Alkalis, such as washing soda, strong soaps and soap powders, are actually harmful to any silk fabric, and ammonia should be used judiciously for dark coloured silks only. Silk, being an animal product, must not be boiled, nor must it be washed in very hot water.

How to Wash Silk Articles

Before commencing to wash, sort all silk articles into three distinct lots, white silks, coloured, and black. The white silks should be washed first, commencing with the least soiled and finest fabrics. Prepare sufficient warm soapy water for the amount of washing to be done; the lather can be obtained by using soap jelly or soap flakes. Soap flakes are made by shredding yellow soap, and drying and storing it ready for use. When required, put about two tablespoonfuls of flakes into the bath, and pour on a little boiling water, adding warm water or more soap as may be found necessary.

It must be remembered that no cleansing whatever takes place unless there is a lather on the water. The amount of soap that is necessary to do this entirely depends on the nature of the water, whether hard or soft. When dissolved soap is required quickly, place a cake of yellow soap in a wire cage soap-saver and pour boiling water over it.

Wash silk garments by kneading and squeezing. A little hard yellow soap can be

rubbed on to any specially soiled parts such as collars, cuffs or bands. When the garments are quite clean on the right side turn them and wash them on the other side, it is generally advisable to have a second washing water. Hard rubbing should be avoided, especially for loosely woven silks. When clean, rinse first in warm water, then in cold this removes the soap and clears the fabrics. The appearance of white silk is enhanced by careful blueing which counteracts the yellow tinge that white silks invariably acquire after having been laundered several times.

Stiffening and Ironing. Silks that require stiffening should be immersed in gum water. To make gum water, dissolve 2 oz. best white gum arabic crystals in $\frac{1}{2}$ pint of water. Strain the solution through muslin and bottle. When required, 1 to 4 teaspoonfuls of this solution should be added to $\frac{1}{2}$ pint of cold water. For large articles, such as dresses and curtains, the quantities must be increased proportionately. Thick silks, such as corded shantung and tussore, are better not stiffened. The appearance of glossy silks is improved by adding a dessertspoonful of methylated spirit to the stiffening water. Small silk articles, after being wrung out can be rolled down tightly in a clean cloth. On no account should silk be completely dried and damped down but should be ironed when half dried out.

The finished appearance of washed silk depends on the ironing. The object should be to iron it in such a way that the finished appearance resembles as closely as possible the material when new. Therefore, some silk should be ironed on the right side and some on the wrong. The following look better ironed on the right side—Jap. glass, foulard tussore and shantung.

Any patterned silks, embroidered or corded should be ironed on the wrong side, also silk lace, crepe-de-Chine, mûton, georgette and stockette. Coloured silks can be successfully got up by following the same direction, but the colours are improved by adding 1 tablespoonful of both salt and vinegar to the last rinsing water. Salt sets, and vinegar brightens, the colours that have been faded by the soap. The colour of black silk is improved by steeping for a short time after rinsing in deep blue water.

Removing Stains. Stains are not so easily removed from silk as from cotton and linen, and some stain removers, such as chloride of lime or eau-de-javelle, must not be employed. When using a bought stain remover, notice carefully if it is suitable for silk fabrics. Use oxalic acid with care to remove rust and ink stains from silk. Turpentine should not be employed to remove paint from silken fabrics, but instead a mixture of one part benzine to two parts of methylated spirit should be used.

Silk for Needlework. Spun silk is used in knitting, crochet, and embroidery of all kinds. It is divided into two main classes, real silk and artificial. Real silk washes and wears well, and can be re-dyed at home. For knitting and crochet and all needlework purposes it is the more satisfactory to handle, as it is soft and the stitches stay in position, while artificial silk is springy, and requires careful handling, particularly in knitting when there are a lot of stitches on the needle. For some decorative purposes the brilliant gloss of artificial silk thread is valuable.

Knitting silks consist of very fine strands very loosely twisted, while crochet silks have a decided twist, to prevent the crochet hook from piercing the silk and dividing the strands. A fine artificial silk is also made for crochet, which is about half the thickness of the standard twist. Crêpe twists are also made in both classes. These silks are usually sold in hanks and balls of 2 oz. and 4 oz., while embroidery silks are made up in small skeins.

Tests for Silk. Though in dyeing properties spun silk differs considerably from the artificial products, the housewife may find it difficult to differentiate between the fabrics in their bleached state. The burning test may be helpful though not always conclusive. Real silk fibre is practically non-inflammable. When ignited the flame does not run, and the ash forms a knob or globule, a smell as of burnt feathers or hair being given off. Some kinds of artificial silk do not flare, but the substance melts back into globules, and the characteristic smell of burned animal feathers is absent. Another type of artificial silk flares up and burns away, with an odour like that of burning paper. The tests are made more difficult by the practice of combining the different materials in the yarn. Some types of artificial silk, particularly those used for stockings, begin to melt when they are brought into contact with excessive heat. See also Artificial Silk.



Silkie Fowl. A curious and distinctive breed, notable for its soft and fine plumage.

SILKIE FOWL. Quite distinctive in the shape and colour of its comb, in the colour of its lobes, face, wattles, and legs, and in the texture of its plumage, the Silkie fowl is unique amongst poultry. It is not a great layer, nor is it a table bird, owing to the fact that it is so small, its bones are dark purple, the skin also is dark. The plumage is very soft, fine, and without web, so that the bird appears to be clothed in a coat of down.

Silgies are bred in four colours—white, black, buff, and partridge. The only utility claim that can be put forward on their behalf is that they are most trustworthy mothers, and no fowl can beat them as a broody. Some exhibitors use half-bred Silkie-Wyandottes for incubation. See Fowl; Poultry.

SILL: In Building Construction. A sill is the horizontal piece of stone, brickwork, concrete, or timber at the base of a framed opening, such as a door or window. Ground sills are the lowest pieces of timber which support the posts and superstructure of a timber building, while the term also refers to the lowest member of a studded partition.

Sills for door frames should be formed of oak; they may be 4 in. by 3 in. or 6 in. by 3 in., and weathered on the external side. The sills of window frames may be of oak, but in many instances similar material to that with which the frame is made is used. External door sills are formed with York stone, cement, bricks, etc., the former being the most expensive. The first essential for any external door sill is a good foundation of Portland cement concrete. External window sills are

formed of stone, brick, cement concrete or tiles bedded in cement.

Provision should always be made to deal with the water that is liable to be received during rainfall. With an ordinary window sill this is accomplished by cutting a throat or groove on the underneath side about $\frac{1}{4}$ in. from the front edge. In the case of a door a piece of iron usually 1 in. by $\frac{1}{4}$ in. is placed on edge into a prepared groove between the wood sill and the brick or stone sill on which the former rests. It is called a water-bar and should be bedded into place with red and white lead. A door sill is liable to wear hollow especially if made of wood. To remedy this

a slot is cut to include the worn portion and a new piece of wood let in. See Door, Window.

SILVER: Medical Uses. In the form of the nitrate or lunar caustic silver is often used in medicine as a caustic where a limited and superficial action is required. Lotions of silver are sometimes used on account of their astringent and styptic action.

A very weak solution 1 to 2 gr. of silver nitrate to the oz., dropped in the new born infant's eyes, after they have been first thoroughly cleansed with weak warm boracic solution, is an efficient protection against ophthalmia neonatorum.

SILVER WARE: BRITISH "PERIOD" STYLES

Pieces that Lend Grace and Beauty to Domestic Life

The reader should further consult the entries on the various silver articles, e.g. Cream Jug, Muffineer; Porringer; Punch Bowl; Spoon; Tankard; Teapot. See also Cutlery; Glass Ware; Pewter; Porcelain; Rebus; etc. See also article on Silver Work.

Fine examples survive of English silver work done during early Tudor times, especially pieces for church use in the form of standing mazers or communion cups. In a prosperous household a large salt container of horn glass shape, and beautifully proportioned, might be found in daily use with silver cups and silver-mounted drinking horns, some odd spoons, a basin and ewer, one or two dishes and candlesticks in silver. In the 16th and 17th centuries tankards, dishes, and other articles were often made in silver gilt or parcel (partly) gilt.

The discoveries of silver in America and its importation in the 16th century placed it well within reach of the affluent. The result was a great increase of domestic plate and the distinction between rich and poor at one time was marked by their uses of silver or pewter for eating and drinking vessels.

Much of interest can be learned about silver ware from the copies that were made by the pewterers. All through the history of the two crafts it is found that when the shape of a spoon was modified by the silversmith, the brass or latten spoon makers copied it and so did the pewterers. When the silversmiths evolved a new candlestick for table use, the pewterers, ever on the watch for something new, copied it, making it a little thicker and sometimes a little more clumsy to compensate for the greater softness of their alloy.

Later the silversmiths were copied by the Sheffield plate workers, but the silversmiths themselves were affected artistically by any art aspiration that came to them from without. The influence of the work of such great designers as the brothers Adam, Chippendale, and Josiah Wedgwood upon the craft of the silversmith can be seen in countless little details which, not in use before their time, must therefore be attributed directly to these influences. Much beautiful silver ware was made during the 17th and 18th centuries in Scotland and Ireland, and bears the Edinburgh, Glasgow and Dublin marks, while some early pieces were marked at Cork.

Drinking Vessels. From church plate to everyday domestic ware, the silversmith's craft has been largely concerned with articles for the service of drink and food. Silver drinking vessels are known by various names, and the line of demarcation between one and another is not always precisely drawn. Prominent among them are the cups used for wine, which are represented to-day by the wine glass, and the challenge cup, given to successful athletes. A main feature of these cups, except in the case of the loving cup type, with two handles, is the absence of that accessory.

Goblets are usually, but not always, bellied, and are supported on a straight stem which may be square, but is more commonly rounded. The vessel known as a steelyard cup, made in the reign of James I, is not unlike the goblet. It has a cover which either fits like a cap or

does not rest directly on the brim, but is raised therefrom by three or four slender balusters. The cover terminates in a spike which suggests a church steeple.

The beaker is another type of drinking vessel. Like the cup and the goblet, it is without a spout and a handle, but unlike them it has no foot, resembling in this respect the modern tumbler. As a rule, beakers are severely plain with straight sides and surfaces decorated with a chased design or a raised pattern. The sides taper and the diameter is nearly always larger at the top than at the bottom. The beaker dates from Tudor times. The hanap was a large standing cup also of early date, and richly ornamented.



Fig. 1. Silver tankard, period George II, with domed lid, thumb piece and graceful handle. Courtesy of Chapple & Minter.

another. They may be quite plain or they may have a bulbous body. A scroll or a bow handle is seen on some examples, and the decoration includes reeding.

Early tankards have straight sides, and are decorated elaborately with chasing and repousse work. In the middle of the 17th century they were designed in plainer styles with flat lids, but in the 18th they were made with domed lids. Fig. 1 shows a typically shaped tankard of the time of George II. More ornamental pieces of later date showed chased designs and raised patterns on the bellied bodies and decorative knobs on the lids. The flagon is very similar to the tankard except that it is of even earlier date. Porringers, posset cups, and caudle cups, all popular vessels from the collector's point of view, may be linked with drinking vessels.

The porringer of the time of Charles II

possessed a cover and usually was of the shape illustrated on the left of Fig. 2, about 6 to 8 in. high being the size of these pieces. Later porringers were made without lids and with straighter sides, as seen in the example on the right of Fig. 2, dating from 1764. Caudle cups in the 18th century were made after the style of the earlier covered porringers.

Liquor Service Vessels. The silver jug has developed along more than one line, according to the use for which it was intended. The cream jug is one form of it, while the hot-water jug of to-day is not unlike the wine jug of two centuries ago. The jug may also be regarded as the ancestor of the chocolate pot and the coffee pot, two pieces of some interest to the lover of old silver. Of these the chocolate pot, in use in high society in the time of Queen Anne, has its spout fixed almost at right angles to the handle. The latter is sometimes quite straight like the handle of a saucepan, not bowed and fixed at top and bottom to the body as is the handle of a teapot.

The earliest silver coffee pots resembled truncated cones with a straight spout and a wooden handle. Fig. 3 shows one of these dating from Charles II. They were next made with an octagonal body, and later with a bellied one and a curved spout, the decoration becoming gradually more elaborate. A vessel very like the coffee pot, and used for the same purpose, is the biggin. The difference is that the latter had a very small spout, this being little more than a lip. Both chocolate pots and biggins are rare, but coffee pots of the early 18th century are more frequently seen. The teapot came a little later than the vessels just mentioned. There exist a few in the Queen Anne style, which has been much copied, but antique examples are mainly of Georgian date. The early ones were without feet, and for them stands to match were often made. Some George I teapots are of octagonal plan with domed covers and faceted tapering spouts.

The tea urn and the kettle may suitably be mentioned together. The kettle in silver with a lamp under it was made early in the 18th century, the urn coming a little later. The early kettles were usually spherical in shape, and a few of them were in a girinal on a tripod frame, thus enabling the contents to be poured out by tilting the vessel. Others had a pair of snuffers attached to the stand and the spout of the kettle was fitted with a hinged lid. Shell work and scroll work are found on 18th century kettles. The most beautiful urns are those that show the Adam influence and follow the classical model by having the body shaped like a Greek vase and add to this chasing and other graceful decoration.

Of the other silver vessels that were used for holding liquor, two of the most coveted are the punch bowl and its near relative, the monteith. An example of a punch bowl dating from the time of George II is illustrated in Fig. 4. The ladles which were made for these



Silver. Fig. 2. Left, beautiful example of large, covered porringer, dating from the time of Charles II, having bellied body decorated with lion and unicorn design. Right, smaller porringer without cover, dating from the reign of George III.



Silver. Fig. 3. Coffee Pot, of conical shape, dating from Charles II; London mark, date 1681-2

By permission of the Director, Victoria & Albert Museum, S. Kensington

bowls with handles often of whalebone or a hardwood, are also prized by collectors.

The best-known kind of sauceboat has a long lip, a scroll handle, and is supported on three feet, but perhaps more prized is the oval one with both ends pinched to form lips. The feet, rims and handles lend themselves to graceful treatment which they received from the craftsmen of the 18th century. Tureens are round or oval, a gadroon border and scroll feet being seen on some fine examples.

Two vessels allied to those mentioned are the pipkin and the argyle. The former is a kind of saucepan which was used for warming food in a living room or bedroom when a formal meal was not required. They are usually bellied at the base and diminish in diameter from the waist to the brim, where there is a small lip at right angles to the handle. The argyle was used for holding gravy at the table. It has a jacket, wall, or other contrivance for holding hot water, the idea being to keep the gravy warm. With a handle and a short spout, the argyle is not unlike a teapot.

Silver Dishes and Baskets. A fruit or cake dish known as a tazza was originally used and described as a drinking vessel. The rimmed dish is supported on a short stem having a round or square foot.

Silver dishes and plates were frequently seen on the tables of the rich in the 17th and 18th centuries, and the former have popular representatives in the entrée and other dishes of to-day. Occasionally they were part of a silver dinner service.

Dishes used for meat are generally oval, and some are provided with a cover. Those used for vegetables have sometimes three or four divisions, while others have a wooden handle straight out from the side. Of all dishes, the entrée or breakfast dish lends itself most readily to graceful treatment, and good examples fetch high prices. Some are provided with a second tray for holding hot water, and many have detachable handles,

so that the cover can, if necessary, be used as an extra dish.

Silver baskets, which were and are used for holding bread, cake and fruit, form a popular class of silverware. Bread baskets date from the 17th century, the earliest being without feet or handles. In the 18th century occasionally handles were on either side. The example illustrated in Fig. 5 is on feet formed of satyr masks and terminating in scrolls. The handle has caryatid supports, the sides of the basket are pierced and engraved with fruit and conventional scrolls. It was made in London and dates from 1739. Later these baskets took the form of an oval tray on a short stem, and a shaped foot. For these piercing was a usual kind of decoration, and chasing was occasionally combined with it.

Sugar basins, known at one time as sugar baskets, fall into the same category. The earliest were quite plain, but later they were embossed and fluted, and later still piercing and other decorative effects were introduced. A glass lining was essential for the pierced pieces, which have often a foot and a bale handle. Others have feet of the ball, lion's paw, or ball and claw pattern.

Castors and Condiment Sets. Sugar was also placed for use in castors or dredgers, of which there exist some charming examples of 18th century work. These castors were made in a variety of shapes. The body, for instance, may be straight or cylindrical, oval or octagonal. Others are shaped like a vase with a bulge just above a short stem. The top or dome was at first quite small, but in time it became larger and was ornamented in a variety of ways, some pieces very elaborately indeed. This ornamentation took the form, in addition to graceful and regular patterns for the holes, of chasing, engraving and embossing.

Castors of this kind were not used for sugar only. They are very often seen in sets of three, the largest being for sugar and the two smaller, which are equal in size, for pepper, white and black. Vessels in which pepper was contained were known not only as castors or dredgers but as mullineers. Salt cellars succeeded the big trencher or bell-shaped salts which usually stood in the middle of the dining table. The bell salts which were made from 1590 to 1613 were made in two tiers, the 2 lower having the receptacle for salt and the top one being pierced for pepper. Early examples of salt cellars date from William III, when they were circular in shape and supported on feet, and also in the same shape from Queen Anne's day. Afterwards they became fashionable in oval, octagonal, and, at the end of the 18th century, in boat shapes.

Mustard pots in silver date from about the middle of the 18th century. The majority of examples are glass lined and agree in styles with



Fig. 6. Silver salver with moulded border and engraved centre ornament, dating from 1730

Courtesy of Chapple & Mestell

the salt cellars of the same periods. Oil and vinegar frames usually have a flat tray on ball or claw feet, with ring frames for two silver mounted bottles. Soy frames were similar in construction. There are two distinct types of 18th century casts. The boat-shaped tray with end handles, and the frame with a central lifting handle and the cut out plate fastened to the handle for the purpose of supporting the bottles.

Other beautiful pieces besides spoons, forks, etc., connected with table service and which are copied to day include butter dishes, tea caddies and canisters, chafing dishes, sweet dishes, coasters or decanter stands, and a variety of candlesticks. There are also a large number of trays and salvers, the former dating from Commonwealth times. A George II silver is illustrated in Fig. 6, having finely moulded edges, other types have borders decorated with gadroon ornament, or relieved with raised scrolls, masks and foliage designs.

Many handsome silver articles were made for other domestic purposes, such as the writing table accessories, including inkstands with taper holders or wax jacks, sand bottles and water boxes. There were also candle snuffers on trays and all the toilet service pieces, such as silver framed mirrors, mounted bottles, pomade boxes, vinaigrettes and a variety of snuff boxes in silver.

By the practical worker and by the student in decoration and antiques much can be learned from the electro-type reproductions in the Victoria and Albert Museum, South Kensington, and from the manuals and hand books published by the museum authorities.

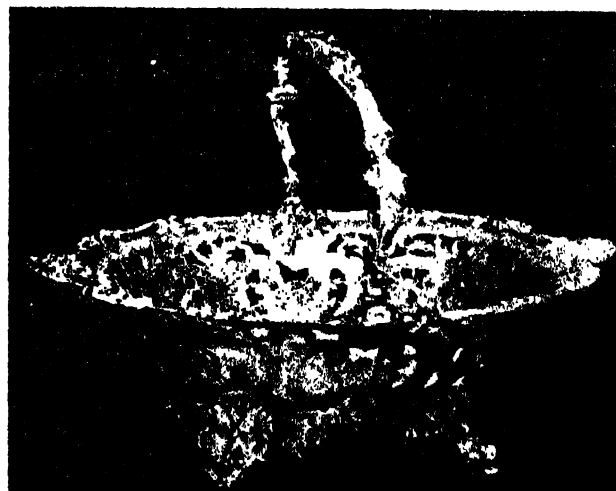


Fig. 5. Cake Basket with feet formed of satyr masks and terminating in scrolls, the sides of the basket being pierced and engraved; London mark, dating from 1739

But besides these there are many books dealing with the silversmith's craft and particularly with hall marks.

Hall Marks. In the early days of the guilds, when pride in the work done was the rule and good work was insisted upon by the master, it became necessary to have a mark which was a ready means for the identification of the worker. To this was added a place mark to show the town of origin, a date mark to show the year of manufacture and a quality mark as a guarantee of the quality of metal used.

Of all the old English silver still in existence nine-tenths at least bear the mark of the Goldsmiths' Hall in London. The symbols

STANDARD		QUALITY MARK	
	1700-1697		1794-1697
	1697-1720		1720-1823
	1720-1823		1823-1855
	1855-1900		1900-1933

London hall marks from 1300 to present day

On silver the sterling standard of 925 parts, or 11 oz. 2 dwt. out of 12 oz., is denoted by a lion passant instead of the crown. The higher standard of 958 parts, or 11½ oz. out of 12 oz., which was the compulsory minimum for plate from 1697 to 1720, and is still permissible, is distinguished by a figure of Britannia and a lion's head instead of the lion passant and the leopard's head. This so-called new standard is not, however, marked in Ireland.

The standard marks at Birmingham and Chester, as well as for Sheffield silver, are the same as above. Edinburgh and Glasgow replace the crown and the silver marks by a thistle and a lion rampant respectively, although since 1914 Glasgow also uses the thistle alternatively. The lower gold standards in Scotland are 15, 12, and 9. In Dublin the 22-carat gold and the silver standard have a crowned harp, the 18 carat a unicorn's head, and there is an intermediate 20-carat Irish standard, with a plume of feathers.

The present provincial town marks, and their earliest dates, are: Birmingham, anchor, 1773; Chester, sword and three sheaves, 1701; Sheffield, crown, 1773; Edinburgh, castle, 1457; Glasgow, tree, fish, and bell, 1519; Dublin, Harp, 1638. The London date mark is indicated by the letters A to U, omitting J, each cycle of 26 years being distinguished by the style of the letter and the shape of the shield. From 1438 to 1558 there were 7 cycles, during

which the shields followed the outline of the letter. From 1558 to 1738 the shields resembled a rectangle on a triangular base. After 1738 the shield's base was usually curved to a cusped point at the middle. In the 1876-1895 cycle the shield's chief was a double concave line, but since 1936 the shields have been simple octagons in shape. The cycle now in operation will run until the year 1955.

The date-letters of the provincial offices are in different styles, shields, and cycles. They are 25-year cycles at Birmingham, Edinburgh, and Dublin, and 25-year alternating with 20-year cycles at Chester and Sheffield, J being invariably omitted. The only 26-year cycle is at Glasgow.

Care of Silver. The best kinds of modern silver are simple in design and rely for beauty on graceful shape and fine workmanship. Most of the plain classical types of table silver are copied, but very highly decorated designs are considered unsuitable for two reasons: they are not strictly hygienic owing to the difficulty of removing particles of food from the interstices, and they take too long to clean. The price of modern silver articles varies in a way out of all proportion to the intrinsic value of the metal used and is almost entirely dependent on quality of design and workmanship.

For cleaning purposes some housewives prefer rouge, which is used by jewellers, and mixed with water containing ammonia it is a good cleanser. Others may prefer jeweller's soap, which gives most excellent results. Some, again, put their faith in plate powders, while others always use polishing fluids.

A good cleansing agent is precipitated chalk, and the finer the better, applied with ammonia and water, or with sal volatile if expense is not to be considered. Do not use whiting as it is sold in the rough, but either precipitate the chalk or buy it ready-made. After cleaning remove all traces of the rouge, paste, chalk, or other cleaning and polishing medium by means of a brush.

It is a popular fallacy that washing has an injurious effect upon silver, causing it to become discoloured and destroying its polish. The truth is, however, that if silver is to be kept in good condition, it should be washed immediately after use, and then cleaned in the

usual way. Warm soapy water, to which a little ammonia has been added, should be used. If rubbing is necessary, choose a soft sponge small enough to be passed inside the neck of jugs, etc.

Filigree silver is sometimes difficult to clean because dust collects in the crevices and seldom yields to sponging. For this an old tooth brush will be found effective. The bristles should be fairly stiff, but not hard enough to produce scratches. Silver ware should be dried thoroughly after it is washed, and if it does not require cleaning rub it well with a chamois leather. This will restore its polish.

Silver inkstands that are disfigured by ink splashes of long standing are sometimes difficult to clean, though stains that receive early attention can always be washed away with hot soapy water. A paste made from water and chloride of lime is often effective in obstinate cases. It should be applied with a soft rag, and allowed to dry on the stain before being rubbed off.

The storing of food in silver utensils is never attended with risks, because silver, unlike copper and brass, is a metal that is not acted upon by food acids.

When not in use, silver cutlery is best stored in a large piece of baize. Each knife, fork and spoon should be rolled up separately, and the baize then tied securely with string or tape. This method of storage keeps out the air and thus obviates the need for constant polishing.

If silver has to be repaired it must go to a working silversmith, not to an ironmonger. Silver will stand a vast amount of hard usage, and in repairs it will stand the fire necessary for hard soldering. If silver has once been soft soldered and later on requires repair with hard solder, all traces of the previous soft solder repair must be removed. Repair can be done quite easily by a qualified silversmith, and good silver should on no account be entrusted to anyone else.

SILVER BEET. Also called seakale beet, this is a vegetable of striking appearance, grown for the sake of its edible stems and midribs, which are cooked in the same way as seakale, and for the leaves which are treated as spinach. It is raised from seeds sown out of doors in April and May. See Seakale; Spinach.

SILVER BELL TREE. The snowdrop or silver bell tree, of the family Halesia, is one of the most beautiful of summer-leaving trees when in bloom, its white flowers bearing a marked resemblance to snowdrops. It does not often attain a greater height than 15 ft. It is therefore suitable for a small shrubbery, or for a lawn. The best kind of this tree is Halesia tetraptera.

SILVER FOX. Perhaps the most expensive of all fox furs, silver fox derives its name from the long silvery white hairs that provide such an attractive contrast to its rich, glossy black coat. In firmness it is unequalled, yet it has a remarkable softness that gives it a foremost place among good furs. See Fur.

SILVERING: OF MIRRORS. In the production of mirrors one surface of the glass is coated with a mixture of silver, and this process is known as silvering.

A method that should give satisfactory results is as follows: Prepare a solution of nitrate of silver in the proportions of 90 gr. of the silver to 4 oz. of distilled water. Prepare a solution of pure caustic potash in the proportions of 1 oz. of potash to 2½ oz. of distilled water, and a third solution consisting of 1 oz. of milk sugar in powder form to 11 oz. of distilled water.

The half of the first solution is placed in a clean tumbler or other glass vessel, and pure ammonia (sp. g. 0.880) added to it very slowly, drop by drop, until the precipitate is just dissolved. Twice the quantity of the second



Method of stamping hall marks



Chester

Edinburgh

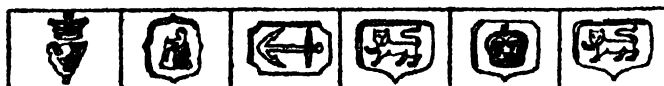
Glasgow



York (closed 1856)

Exeter (closed 1832)

Newcastle (closed 1886)



Dublin

Birmingham

Sheffield



Silver. Standard hall marks of the provincial offices, both closed and active, are given, in addition to the London hall marks shown above

Courtesy of Herbert Jenkins, Ltd.

SILVER WORK FOR THE AMATEUR

Ornaments for the Home and for Personal Adornment

The metal worker who is interested in this subject should turn to the articles in this work under Metal, Metal Spinning, Metal Turning, also to Drill and Engraving, Riveting, Soldering, Wire. Those on Bowl, Spoon, and other articles made can also be consulted while kindred operations are described under Handmaking, Repousse, etc.

solution is added, and ammonia again added to the solution until it just becomes clear. It is then further diluted with distilled water, the proportions being $1\frac{1}{2}$ times that of the combined solution. The next step is to add gradually some of the first solution until a slight grey precipitate is formed which does not redissolve. It is then allowed to settle and after that some of the third solution is added and well stirred.

The plate glass to be silvered has now to be properly cleaned. This can be done by washing in a solution of ammonia water: following this by washing in a solution of hydrochloric acid in the proportions of 1 part of the acid to 100 parts of distilled water. The glass is then rinsed, dried, and polished with a perfectly clean cloth. The plate must now be placed on a dish and carefully levelled until the surface of the glass is perfectly flat and horizontal when the solution is poured very gently on to the glass so that it will cover the whole plate.

The operation must be carried out in a warm room, which must be quite free from dust, and the glass allowed to remain for several hours. At the end of that time the solution is poured off the plate, the latter again set level, and a fresh supply of solution poured upon it, and left there until the silver has deposited. The plate is well rinsed in distilled water and set aside to dry. It is then given a coat of varnish, following this by a coat of good paint made up from finely ground lead and a little turpentine.

Every vessel used in the solutions for the separate steps in the various processes must be chemically clean, and the processes carried out in a cleanly manner.

SILVER LEAF: The Disease. This malady attacks plum trees chiefly, but several other fruit trees, as well as laurel and some other shrubs, are liable to it. There is no cure, and diseased branches should be cut off and burnt. Silver leaf is easily recognized by the silver grey colour of the leaves. The Victoria plum is particularly liable to this disease. The law requires all dead or affected branches to be cut off and burnt before mid-July. The disease is believed to make more rapid headway on heavy soils and in damp situations. Any improvements, therefore, in the drainage of an orchard will help the trees.

SILVERSIDE : Of Beef. That portion of the round of beef which is known as the silverside is considered, when salted, to be a prime boiling joint, it is also economical, as there is little bone and practically no fat attached to it. The round is divided into two, cut downward, one part being called the top side and the other part the silverside, but the latter is most usually salted or pickled. Silverside also may be boiled, braized or stewed without salting, and sometimes it is roasted. It is usual to obtain it ready pickled from the butcher, but it may be prepared at home by directions given for salting, and will take about 10 days to pickle properly.

When about to cook, wash the meat free from brine, wipe and weigh it, but if it appears very salt when sent home it is better to soak it for an hour in cold or tepid water, changing the water several times. If too much salt is left in the meat it will be hard when cooked and the liquor from it will be unfit for culinary purposes. This liquor, if strained off, makes very good stock for pea or lentil soup. The butcher should skewer the silverside together neatly, adding a small lump of fat. The skewers should be removed when dishing the meat. It should be carved in very thin slices.

SILVER WEDDING. The 25th anniversary of a wedding. It became a custom that presents given on such an occasion should be of silver. Other special wedding anniversaries are pearl (30th), ruby (40th), golden (50th), diamond (60th).

The working of silver, as dealt with in this article, falls into three main divisions. The first is confined to the manipulation of the flat metal and includes riveting, silver soldering, repoussé and chasing. The second deals with beaten work, such as the shaping of bowls and other round shapes worked from the flat metal. Another form of silver work comprises the use of the metal when it has been drawn out in the form of wire in any section. It can also be cast and used with enamel, but these operations are beyond the scope of the present article.

Silver is generally sold by the oz. and measured by the metal gauge, but the thicknesses mentioned will be in S.W.G., and it should be obtained rolled ready for use from a silversmith or a

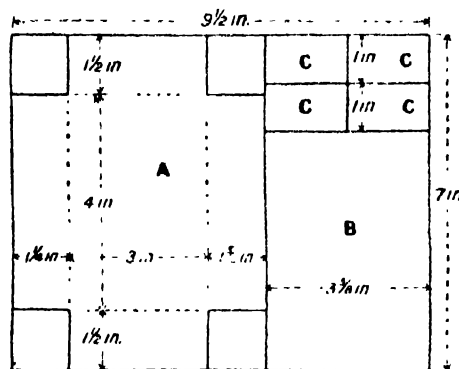


Fig. 1

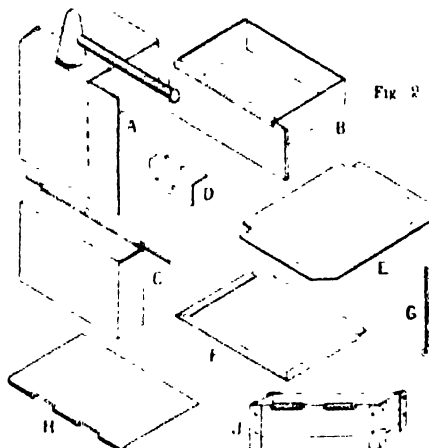


Fig. 2

Silver Work. Fig. 1. Piece of silver marked out for making a simply designed cigarette box: A, base and sides; B, top; C, angle pieces. Fig. 2. A, bending up sides on hardwood block; B, edge of back turned over steel plate; C, round folded over steel rod; D, corner piece; E, lid; F, edges of lid folded back; G, sectional view of edge turned over steel rod; H, cuts made for hinge; J, box ready for lid

dealer in art metal working materials. The various tools required for each stage are enumerated as they are required, and the essential ones are illustrated.

A Cigarette Box. A simple piece of work for the beginner might consist of a cigarette box, with corner angle plates forming feet and a hinged lid. Suitable gauge is 20 S.W.G., and a piece measuring 9½ in. by 7 in. will be sufficient for the whole of the box. Mark out the piece of metal as in Fig. 1. A forms the base and sides, B the top, and C the angle-pieces. The small squares surrounding A are waste, but they will be found useful for making various small articles.

The parts are cut apart with a pair of shears and the edges true'd up with a file. The next step is to bend up the sides on a hardwood block, as in Fig. 2, A, fitted in the vice or firmly attached to a table, using a mallet and working very lightly so as not to bruise the metal. The back is turned over on a piece of steel measuring $\frac{1}{4}$ in. thick, as at B, the top edge being rounded and made perfectly smooth with emery cloth.

Having folded the metal on to the face of the stake place a length of $\frac{1}{2}$ in. steel rod in the hollow and carry the metal around it to close it in, as in C. The corner pieces are bent in the centre at right angles, as at D, and the holes for the rivets drilled. These pieces are placed in position one at a time, the holes marked through

The lid is cut to the shape shown at E and the edges first turned over at right angles and then folded over quite flat, as at F. The back projection is turned over on the narrow stake and the round completed as at G, in the same way as the bottom. The two rounded portions are placed together to mark out the cuts to form the hinge, these are then made with a piercing saw, as at H and J and trued up with a file. A length of brass or copper wire is then cut to the length of the side and fitted in

If the hinge work has been neatly done there is no need to solder the round in a small piece of work, but in making a larger casket on similar lines it is safer to solder the joint, especially with a heavy lid. Considerable variety is possible in the design of small boxes, and a pleasing effect is to use hinges (either pierced or in repousse) soldered or riveted to the lid and back. Hairpin boxes, jewel caskets, and stamp boxes are suggestions for this type of work.

Hollow Work. The second division in silver working is that of forming bowl shapes from the flat metal, and this can be done by three distinct methods. The commonest is that of forming the shape by beating it into a depression on a block of wood, or over the edge of a block. The simplest article to commence with is a pin bowl as in Fig. 3, made from a piece of 18 S.W.G. silver from 3 in. to 4 in. in diameter. With a compass draw the size of the base inside a 4 in. circle, it should be about 2 in. in diameter.

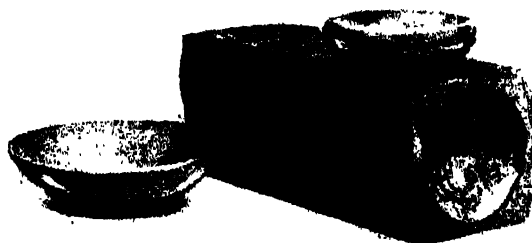


Fig. 3. Two silver pin bows which can be made by following the instructions given here. A shaping block is also shown.



Fig. 4. Blocking hammer being used on a hollow block

leaving 1 in. all round to form the sides. Next provide a stake of the necessary shape (Fig. 3). This is made from a piece of hard wood about 3 in. square and 6 in. long. Place the block upright in the vice, mark a 2 in. diameter circle in the centre, and then with a gouge cut out a concave depression to a depth of $\frac{1}{2}$ in., finishing the

plate the sides should be nearly upright, as at F, and it will be somewhat difficult to proceed further with the hammer.

The final stage calls for the use of a stake but as this is rather expensive, the beginner will find the round end of a poker quite as good for small work. Before the final shaping is done the silver must be annealed by placing it on top of a shallow bowl filled with charcoal or small coke, and playing a blow pipe flame over it until it is red hot. The alternative is to place the bowl over a gas flame but the greatest care must be taken not to overheat the metal. A good earthenware bowl should be provided to hold the pickle of equal parts

of sulphuric acid and water, and the annealed metal is then dipped in it and left until it becomes frosty white when it is washed and dried in sawdust.

The bowl is now placed on an appropriately shaped stake and the edge beaten over, or the same process followed with the poker head, as

at G, Fig. 6, and this will result in the shape as at H.

Planishing. The bowl at this stage should be quite even in shape, but to give it the desired finish, the surface must be planished after being again annealed. A stake is almost a necessity in the planishing as to be done in a workmanlike manner, but if a conical shaped poker head can

be obtained and the end filed off, it will be possible to get close to the inside corner. The regular and even hammer marks on handmade silver work give it a beauty and charm that is impossible to produce in any other way, but the real effect of the

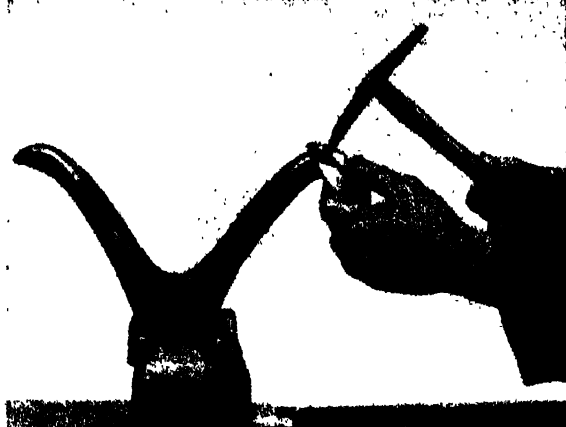


Fig. 7. Using the raising hammer in coursing

planishing is to true up the surface and stiffen the shape. It is possible to spoil the work with careless planishing; the hammer blows must be evenly spaced and weighted, and if the hammering is heavier in one part than another the bowl will be uneven and difficult to true up.

Another method of forming a bowl requires no other tools than a hammer or mallet and an anvil, or very hard wooden block. It is done by placing the metal on the anvil and, commencing in the centre, hammering in concentric circles to the outside. The

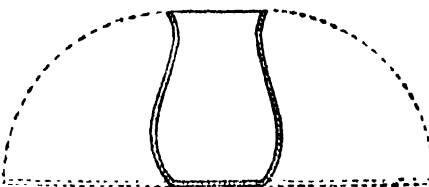


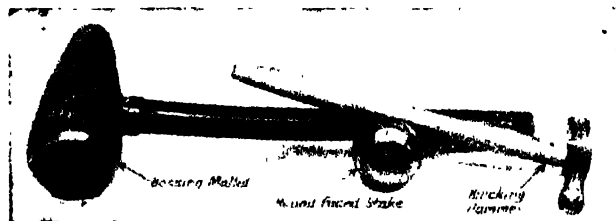
Fig. 8. Shape for a vase, shown in section, which can be made from a circular piece of silver

success of this method depends on accurate hammer work. Full directions are given in the article on Bowl (p. v.), where the shaping of a copper one is illustrated.

Once having worked out a simple bowl shape by either of the above methods, it will not be difficult to form this into other shapes. It is just as easy to turn the edges out as in. For example, the shape at J, Fig. 6, can be worked on a stake as at K, and the edge flattened out as at L by hammering the edge on a pick iron. Fluted forms can be formed by using a raising hammer as at M and N, on a notched block as at O and pannelled shapes can be worked by flattening the round sides as at P.

Coursing. This process consists of hammering the metal against a stake as shown in Fig. 7. The metal is held in contact with the stake about 1 in. below where the hammer is struck in order that the metal is hammered on to the stake. To make the shape shown in the section at Fig. 8, a piece of 16 S.W.G. silver should be cut in a circle a little larger than the contour of the section, as shown by the dotted lines. Next draw a number of concentric circles commencing $\frac{1}{2}$ in. from the centre, each one increasing in radius to the outside, in order to guide the hammer blows. The metal is now beaten into a rough bowl shape with a mallet, by driving it into a hollow stake. The stake shown in Fig. 7 is then fixed in the vice, and the hammering commenced, the blows being carried completely round; a second course follows $\frac{1}{2}$ in. higher up, and each succeeding course is followed out in the same way as before.

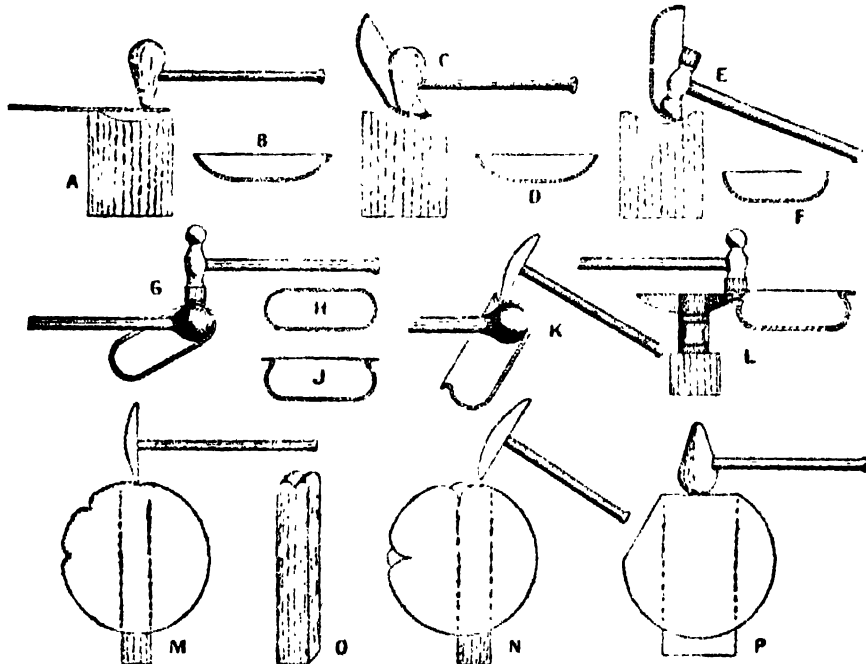
The metal has a tendency to work into wrinkles. These must not be allowed to increase in size, but must be flattened out at



Silver Work. Fig. 6. Tools necessary for making the silver pin bowl shown in the previous page, and for other hollow work

the metal, and the result will be as shown at B, Fig. 6. The bowl is tilted up a little as at C, and another round of blows is given; this will bring the sides up higher, as at D. The next stage is similar with the bowl still higher, as at E, and when this round is com-

pleted the sides should be nearly upright, as at F, and it will be somewhat difficult to proceed further with the hammer.



Silver Work. Fig. 6. Various processes in making bowls. A, heating hollow in metal with blocking mallet; B, result of striking a series of blows round the metal; C, bowl tilted for another round of blows; D, result of second round; E, third round of blows; F, its result, sides nearly upright; G, heating edge round a poker head; H, resulting shape; J, shape with out-turned edge; K, method of turning edge; L, out-turned edge flattened; M and N, methods of forming a fluted edge; O, notched block for fluted edge; P, pannelled shape achieved by flattening rounded sides

once; if these wrinkles are allowed to form it is probable that the work will split at that point. The advantage of this form of shaping is that all kinds of shapes can be beaten out, but owing to the initial difficulties and the expense of silver compared with copper, the beginner will be well advised to undertake some preliminary raising with the latter metal. A selection of suitable tools is shown in Fig. 9. The necessity of frequent annealing must not be forgotten.

Soldering. The worker cannot advance very far without silver soldering. This requires the use of a blow pipe and a spirit lamp. A small piece of work suitable for a first attempt is a napkin ring which has been made up from the flat and has to be joined.

The method of using the mouth blow pipe is as follows. The portions surrounding the joints are freshly scraped or filed, fixed in place with binding wire, and touched with borax, which is rubbed down with a little water, and applied in the form of a thick cream. Small scraps of silver solder are placed close up to the joint, which is now ready for the application of the flame.

The lamp flame is directed around the work first to warm it, and presently the borax will boil up and then run into a fluid state, carrying with it the solder. The parts to be united must be kept in close contact till the work has cooled. *See under main heading Soldering.*

SIMMERING. In cooking, simmering consists in keeping any liquid in a heated condition just below and never actually reaching boiling point.

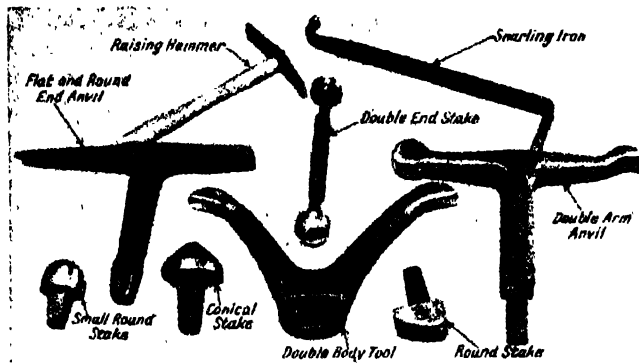
SIMNEL CAKE. This cake, eaten in Lent, is made by creaming 6 oz. each margarine and sugar, and then beating in four eggs, adding each one separately. Mix in 9 oz. flour, 1 lb. cleaned currants, 5 oz. mixed chopped peel, 2 oz. shredded almonds, and $\frac{1}{2}$ teaspoonful mixed spice. Add 1 tablespoonful milk.

Turn the mixture into a tin lined with greased paper, and bake it in a moderate oven for about 2 hours. Leave it to cool on a sieve, and when it is cold cut it into two rounds. Divide $\frac{1}{2}$ lb. of almond paste into two, roll it into two rounds of the same size as the cake, put one round between the pieces of cake and lay the other on top. Mark a trellis pattern on the latter, brush it over with beaten egg, and put it into the oven so that it becomes just lightly browned. *See Almond Paste.*

SINGING: In Cookery. Poultry and game are singed, after being plucked, in order to remove long hairs and down without risk of tearing the skin. Singeing is best done with a long, loose spill of white kitchen paper. The bird is held in the left hand by the scaly part of the legs, and the lighted paper is applied quickly and just long enough to burn off the hairs. Pigs are singed after scalding to remove long hairs or bristles.

SINGING GAMES. The traditional singing games are still popular among small children, and are hard to beat for charm and variety. They have also a distinct educational value, combining singing, dancing, and rhythmic movement.

A happy entertainment can be given by children of from four to ten years of age simply by the joyous performance of a dozen or so of these games. They involve little



Silver Work. FIG. 9. TOOLS USED IN THE PROCESS KNOWN AS RAISING
Courtesy of C. J. Plucknett & Co., Ltd.

rehearsal, since the effect would be largely spoiled by a lack of spontaneity, but the organizer of the entertainment should be careful that the children know the correct tunes and that the games are played with the proper actions. If all the small players are dressed in similar costumes, such as the Kate Greenaway style, the effect will be doubly charming. Books can be obtained which offer a large choice of these games giving the music and describing the actions. Some of these singing games will be found under their own headings in this Encyclopedia e.g. Nuts in May.

SINK. In every house the sink is a necessary sanitary fitting, whether in the scullery or the kitchen for the cleansing of

domestic utensils, and similar purposes. Sinks are made in glazed stoneware, aluminum, and stainless steel. The deeper a sink is, the better. And if it is in a good light, then the user is fortunate indeed.

A sink is usually subjected to considerable use, and therefore is apt to become soiled. All traces of grease and other dirt should be removed as they occur, with hot water and a cloth, and perhaps one of the scouring powders. But nothing likely to scratch the surface should be used. A saucepan or anything else placed in the sink should be let down gently, to avoid possible damage.

Such things as tea-leaves should not be emptied into a sink. Not only do tea-leaves stain but they are likely to lead to a blockage of the waste pipe. If a blockage occurs, the pipe can be cleared as explained in page 381. *See Draining Board.*

SIRLOIN: Of Beef. The sirloin is that portion of the ribs which lies between the rump and the wing, or fore ribs. It corresponds in position to the loin in a carcass of mutton. Sirloin is a prime roasting joint and should be cooked with the bone left in it. If it is boned the flavour will be spoiled.

Attached to the rib bone underneath is a very delicate portion of flesh called the undercut or fillet. This part is better eaten hot, and should always be carved off first. It should be cut down to the bone in slices about $\frac{1}{4}$ in. thick, but the slices carved from the top portion of the joint should be as thin as possible. *See Baking; Beef; Carving.*

Sisyrinchium. *See* Sam Flower

SITTING-ROOMS AND THEIR FURNISHING

Distinctive Ideas for the Odd Reception Room

Suggestions for the arrangement of family reception rooms are given in the articles on Dining Room; Drawing Room; Living-Room; Lounge. Readers are also referred to the entries on Attic; Colour; Cottage; Decoration; Flat; Fireplace; Furniture; House; Paneling; Rugs.

In many houses there is a room which is furnished as an odd sitting-room with a jumble of pieces which have seen better days and no particular colour scheme to bring them into harmony. Sometimes this room is called a morning or breakfast room, and is in the basement or semi-basement next to the kitchen and on a level with the garden. Such a room usually possesses a window with charming possibilities, and this can often be taken as a starting-point for the housewife's plans for redecoration. These plans can be quite inex-

pensive if carried out with a sense of colour and good taste. In other cases the room is upstairs and perhaps is chiefly used by one individual or by the younger members of the household.

To begin with, take the basement or ground-floor back room as an example. Even if there is a pleasant view into the garden, such a room is unlikely to be well lit, especially in the winter, and it is therefore necessary to keep walls and ceiling a pale colour and have bright accessories such as a mirror over the fireplace or opposite the window, one or two



Sitting-room. FIG. 1. Comfortably furnished sitting-room with charming tiled fireplace and built-in bookshelves. The floral design of the loose covers unites the colour scheme of the room.

Humphrey & Parnes Ltd.

pieces of lacquered brass or copper, and some pale tinted or white glazed pottery to reflect or catch the light. In a small room the plainer the wall surface the better, but distempered walls will not have the same durability of surface as a faintly marbled or patterned paper.

An inexpensive oriental carpet is a good choice for such a room, as it can be obtained in bright, light colourings which at the same time do not show marks. In a small room a dark fawn shade of hair carpet and wool hand-worked rugs, designed in colours to match those in the cretonne selected for the window curtains, will prove a delightful scheme with beige or old ivory ground to the wallpaper and faint pink or ivory washed ceiling.

A window seat upholstered in the same cretonne as the curtains is attractive where there is a bow window. A boxpleated or gathered valance for both seat and curtains is the appropriate finish. Glass curtains are not always necessary, especially when the ground of the practical curtains is light in colour. If required, inner curtains may be made of a plain cream net with a border of stripes needle-run with wools to match the colours of the patterned rugs and hangings. Such a border gives a distinctive note, which can be also picked up in the stencilled patterns on imitation vellum lampshades and on hand-painted washable door plates of a cellulose composition. These latter items are obtainable for a few shillings each. A still better idea is to paint designs copied from those on the cretonne curtains, on the back of plain glass door plates. It is these small things which count so much in interior decoration.

With regard to the style of the furniture, having surrounded it with such an agreeable setting, it really does not matter vitally in a room of this type. Naturally it is nicer if of good simple design and excellent workmanship, but with the absence of drab accessories and in particular of all ornaments which do not give or reflect light or enrich colour, and the resolute banning of rubbish, the room will be both homely and charming. Wicker or cane chairs should be enamelled the same colour that is chosen for the woodwork of the room, or, if this is stained brown, then to match the ground of the carpet. Upholstered



Fig. 1. Sitting-room for a man, with thoroughly comfortable chairs, charming brick fireplace and attractive built-in cupboards flanked with bookshelves

Humphrey & Vera Jones

Victorian chairs are best given loose covers. If new small chairs have to be bought, those with ladder backs and rush seats have much to commend them, as they are neither old nor modern in style and harmonize with other furniture of odd periods and with cretonne linen or chintz hangings.

In a typical up-stairs town sitting room of medium height and about 12 ft. square, perhaps a feature which has to be reckoned with might be the sitting-room tiles. These may be, for example, leaf-green, the woodwork and mantelpiece being already enamelled the usual ivory shade. In order to achieve brightness, height and warmth in a room with a cold aspect, the walls could be painted a pinky beige and the ceiling distempered the same colour.

The floorboards are best stained oak brown and wax polished. The carpet might have a darker brown ground and be unobtrusively patterned in beige. Brown furnishing satin or velvet would be used for the curtains, lined

with fadeless green poplin while the glass curtains would be of string-coloured net. A printed linen or glazed chintz chosen for the loose covers should have a leaf-green ground and be patterned with dull pinks, lavender and soft yellow. Plain cushions should repeat the darker notes of colour.

Charming sitting-room of this type is shown in Fig. 1. Good use has been made of the recesses on either side of the chimney breast by fitting them with bookshelves. The modern weathered oak writing-table and chair have

nothing eccentric about their style. They would accord perfectly with any other plain pieces suitable in such a room. An alternative to the settee would be a well-upholstered divan, covered in plain brown velvet or furnishing rep, measuring 6 ft. by 3 ft., raised from the floor on a strong frame and piled with cushions against the wall. The cushions would repeat the colours of the patterned material used for the loose covers of the chairs. Three piece suites are not to be had cheaply, they are not wise investments unless the frames are strong and well upholstered. Single armchairs can sometimes be picked up in reliable qualities for a comparatively low price at an auction sale.

For the same kind of room, but with a sunny aspect, the scheme could be worked out with pale green walls, ivory-washed ceiling and furnishing fabrics of different shades of grey with a printed linen having a brightly coloured conventional pattern in clear tones of lemon-yellow, coral, black, light blue and green on a grey ground.

Individual Tastes. In some cases a sitting room can be decorated and arranged according to individual requirements. A pleasant room for one musically inclined is illustrated in Fig. 2. This is in a country house, and the walls and ceiling are of parchment colour which enhances the overhead oak beams. There are two rounded niches which have been fitted with bookshelves, a delightful window with simple curtains which could be of velvet to tone with the plain carpet. There is a thoroughly comfortable chair for a privileged listener, an old oak chest and a modern oak writing table, but otherwise the room is restfully empty of unnecessary furniture, and there are no pictures. Colour is supplied by the books, flowers and the garden view. In such a room the mantelshelf should not be overcrowded. A bit of coloured glass, an old spoon or lustre dish or jug, or a pottery figure piece, to break the line against the wall, are a good choice; there should be no small ornaments or fussy details to the furnishing accessories.

Our third illustration is of a delightful sitting-room particularly suitable for a man. The walls have a panelled effect obtained by applying moulded strips of wood on panel boards. The plain frieze and ceiling are cream washed. A specially good feature is the use made of a recess for a built-in bookcase and cupboard with mirror glass door, a smaller cupboard and spaces for gramophone, etc., being fitted below. The brick fireplace with its pattern of mellow colour against the woodwork is enhanced by the white pottery book ends and jar. The fire is a gas one made to



Sitting-room. Fig. 2. Restful country sitting-room blending the old world with the new by the use of a few unobtrusively modern pieces of furniture

Humphrey & Vera Jones

simulate glowing logs. The low book table suits the height of the chairs, which are most sensibly and attractively covered, one in velvet and the other in a furnishing oil baize. At the opposite end of the room (not seen in the photograph) is a beautifully made leather topped writing-table designed on square, modern lines and an equally suitable modern cabinet with a drawer under the cupboard.

Such a room suggests a colour scheme completing the harmony of tones in the woodwork and brick fireplace. To carpet it all over in brown velvet pile would look most comfortable and suitable at first, but would not be good in wear owing to marks from cigarette ash and footmarks. The oriental carpet, or woven geometrically patterned rugs, would be again the best choice in subdued shades with a good deal of rust, dull reds and browns in their colouring. A fine shade of red that is between rust and crimson, which is particularly good in velvet, might be used for the curtains, and one of the armchairs might be covered in this fabric, while brown would be used for the other chairs. Instead of velvet, quite an excellent furnishing material is a fairly close woven tweed. A flecked brown, beige and red mixture, piped with plain brown, would be most practical, comfortable and effective for covering the armchairs and for the window curtains. The last should be lined with fadeless brown caseament cloth.

If linen or cretonne curtains are preferred they should have conventional patterns, either a checked or geometrical design of reds, browns, greens and wine colour on a beige ground would be suitable. Another good fabric for covering the chairs would be plain and checked mohair. An effective style with this material would be to use a plaid mixture of brown and tan for the seats of the chairs and a plain brown for the back and cushion. Alternatively a plaid mohair could be used entirely to cover one chair and a plain mohair to cover the other. The ground of the plaid must match the plain fabric in colour.

SIZE. Size is a glutinous substance commonly made from the parings of leather, hoofs, parchment, etc., after prolonged boiling in water, and purification by straining. It may also be made from common glue and potatoes. Painters use size in connexion with various kinds of work. Before a wood floor is varnished it should be sized, the size stopping up the pores of the wood and thus allowing an easy and economical application of the varnish.

Size is generally a constituent of good distempers; it has an adhesive effect upon the distemper after it is applied to the walls or ceilings of a building. Size may be purchased from any colour merchant in kegs; it is then in a jelly or viscous state; but it may also be obtained in a concentrated form in small packets. To render it fit for use it is dissolved by boiling water and applied hot with a brush.

Wallpaper should be sized after hanging (and when it has quite dried), if it is to be varnished. See Painting: Paperhanging.

SKATE: How to Cook. Skate should be kept at least one day, and should not be eaten directly after it is caught, but it must never be taken out of season, and is better in the late autumn and winter. The time for it is from August to the following April. It is advisable to buy this fish ready dressed from the fishmonger, as it is a difficult process to crimp it, and even if the fish is to be boiled whole it will need to be skinned both sides. The liver is usually removed and made into sauce, or served with the fish as a garnish. The directions given for crimping and cooking ray may be followed for skate.

The wings or fins of the skate may be made into a breakfast dish. Dry the wings of a large skate, skin them, and cut them into fingers, then blanch them. Put the pieces on

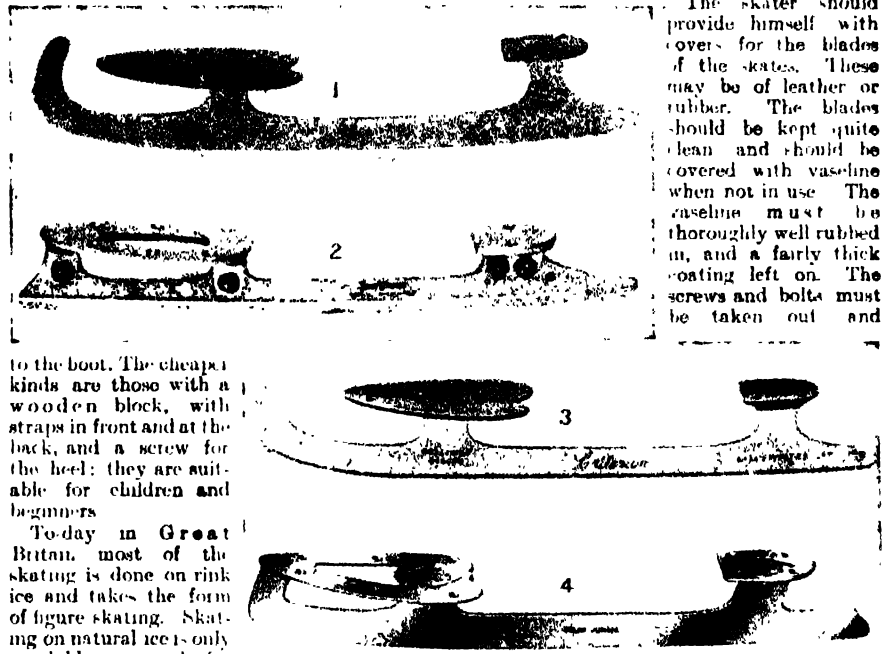
a tin and cook them in a moderate oven till quite tender. Then draw out the bones and rub the flesh through a sieve. Melt 3 oz. margarine in a stewpan, add the fish, lemon juice, grated nutmeg, pepper and salt, mix well, and dish on buttered toast cut into squares. Pour round it a thick egg sauce. Skate when crimped can be served with some piquant sauce. See Fish: Ray: Sauce.

SKATES: Their Care. For use on ice the skate is made with a steel blade secured to metal plates or a wooden block for attaching

skates used for figure skating. The Ice King is a good example, but there are others.

Boots and Accessories. The skater's boots are important. Special boots are made and sold for skating, but ordinary laced ones can also be worn. They should, however, fit perfectly and should be provided with a moderately thick sole, flat straight heel, and fairly stout uppers. They should fit tightly, but when they are first put on the ice it is advisable not to lace them up too tightly; the laces can be tightened after the first few minutes on the ice.

The skater should provide himself with covers for the blades of the skates. These may be of leather or rubber. The blades should be kept quite clean and should be covered with vaseline when not in use. The vaseline must be thoroughly well rubbed in, and a fairly thick coating left on. The screws and bolts must be taken out and



skates. Four kinds in general use. 1. Salchow-Meyer. 2. Club, official skate of the English school. 3. Criterion. 4. Junior, suitable for beginners. Courtesy of L. L. L. Ltd.

to the boot. The cheaper kinds are those with a wooden block, with straps in front and at the back, and a screw for the heel; they are suitable for children and beginners.

To-day in Great Britain, most of the skating is done on rink ice and takes the form of figure skating. Skating on natural ice is only available as a rule for two or three days in the year and sometimes not at all, except perhaps in the north of Scotland. Many persons, however, go to Switzerland or other countries where during the season there is natural ice in abundance, but there, too, figure skating is the more popular form.

Types of Skate. Of figure skating there exist two main schools, called the international and the English, and for each there is a particular kind of skate. A good skate of the international type is the Salchow-Meyer, seen in Fig. 1. This has a serrated toe and a narrow blade, which is hollow ground, the depth of the grinding varying with the condition of the ice, as natural ice needs a sharper edge than does rink ice. The point of this skate should touch the boot. The Acme has straps and expanding clamps to clip heel and sole.

For the English school of skating a good type of skate is the Club (Fig. 2). This is a skate with a broad obtuse angled blade slightly hollow ground to a radius of 7 ft. for sizes up to 11 in. and 8 ft. for anything larger. It is the official skate of the English school and is sold in sizes from 9½ in. to 12½ in. Another good skate of the same kind is the Mount Charles, which is generally used for figure skating.

The Criterion (Fig. 3) is a good skate for skaters of the international school and it has the additional advantage of being made entirely of Sheffield steel. Somewhat heavier than the Salchow-Meyer, its footplates are bronzed, a feature which adds to its appearance. The fourth skate shown in the illustrations is the Junior (Fig. 4), one made specially for juniors and beginners. This is very near the ground and has no serrations on the toe.

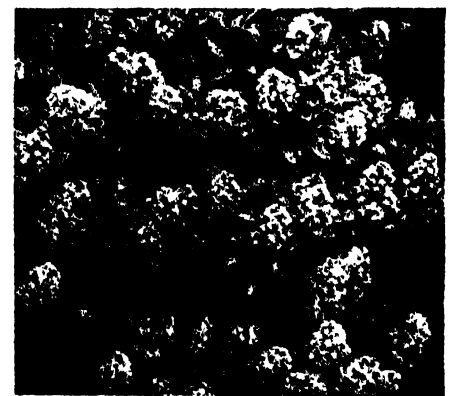
For speed racing a different kind of skate is necessary. This is usually quite straight, lacking the curved end seen in most of the

thoroughly cleaned or they are liable to rust. Skates need grinding from time to time as the edges must be kept sharp. This can be done at home on an emery wheel or a grindstone, but many persons prefer to send them to the maker for this purpose. A skate sharpener that can be carried in the pocket is sold.

Skidding. See Motoring.

SKIMMER. This long-handled metal kitchen utensil is used, as the name implies, to skim fat and grease from the surface of soups and stews. With it, the job is done more quickly and thoroughly than is possible with a spoon. It generally takes the form of a shallow scoop. See Clarifying.

SKIMMIA. This hardy evergreen shrub is about 2 ft. high, and bears white flowers in summer and red fruits in autumn. Male and



Skimmia japonica, a bushy plant bearing greenish-white flowers and, later, scarlet berries.

female flowers are on separate trees and care must be taken to plant both kinds to ensure fruits. Fortune japonica and Foremann are the best. These shrubs thrive in a mixture of loam and peat and should be planted in September or October or April. Propagation is most easily carried out by layering.

SKIM MILK. Milk from which the cream has been removed by skimming or separating is known as skim milk, and, although devoid of the natural fat possessed by new milk, it is used for many purposes in cookery. It makes good milk puddings if a small portion of finely chopped suet is added to enrich it, or it may be used in making batters, milk bread, biscuits or cakes.

Despite the absence of natural fat skim milk is a wholesome and strength-giving food as it retains the casein and a proportion of fat can always be added if desired. The finest variety of pork is that obtained from pig-which have been fed on skimmed or separated milk. See Cream; Milk; Separator.

SKIN: Its Care. The skin is tough and very elastic, so that it stretches when fat accumulates underneath and returns to its former state if the fat becomes reduced. As a person grows older this elastic property of the skin diminishes and causes wrinkles.

The skin consists of two layers, the cuticle without and the true skin within. The cuticle, also called the epidermis, or scarf skin, is subdivided into layers, the outermost is the horny layer, while the innermost contains the pigment cells which give the skin its colour; the accumulation of this pigment causes freckles, chloasma, etc. The cells of the outer surface are continually wearing out and falling off. Blisters are accumulations of fluid under the outer layers of the cuticle, which have no nerves, so that the puny turning of a blister does not cause pain. Thickening of the cuticle takes place in a large number of skin diseases. Parts exposed to intermittent pressure may form callosities and corns. See Corn.

The cuticle, when undamaged, is impervious to water and microbes, but if abraded it admits microbes; some microbes and other fungi can thrive in its gland ducts and on its surface giving rise to skin eruptions. The cuticle allows certain drugs to pass through when they are mixed with oils or fats and well rubbed in.

The dermis, also called the cutis vera, true skin, or corium, is very much thicker than the cuticle. It consists chiefly of interlacing fibres of connective tissue, together with blood-vessels, nerves, glands, etc. The glands are of two kinds, the sebaceous, or oil glands, and the sweat glands. The former manufacture an oily fluid which is poured out on the skin, and keeps it and the hairs soft and pliable.

The sweat glands consist of little tubes about $\frac{1}{4}$ in. long, coiled at the inner extremity and opening on the surface of the skin. The chief purpose of the sweat apparatus is to help to regulate body heat in the widely differing temperatures in which human beings live. The sweat glands are always active, pouring out water on the skin, this may evaporate at once, constituting what is called insensible perspiration, but when we go through exercise they become much more active, and the amount of sweat is greatly increased and forms sensible perspiration (q.v.). The same happens in hot weather or when one is in a warm room.

Certain conditions interfere with the function of the sweat glands. Thus on a damp, hot day the evaporation is checked, and we feel oppressed by the heat in consequence. Because it prevents evaporation, waterproof clothing is unhealthy. Alcohol increases both perspiration and the flow of blood to the skin. Consequently alcohol is a dangerous thing to take when one has to face extreme cold.

It is very necessary for health to promote the normal action of the skin by cleanliness,

correct choice of clothing, and exercise. Many skin diseases arise partly from want of care of the skin. Coughs and colds, and diseases such as rheumatism, etc., find an easier victim in the person whose blood-vessels have no acquaintance with the tonic properties of cold baths.

There is no better means of preserving the elasticity and bloom of the skin than daily brisk exercise in the open air. Even more important is scrupulous cleanliness, not of the exposed parts alone, but of the whole body surface. For those in vigorous health a cold bath every morning and a warm bath once or twice a week are to be recommended. It is often recommended after the bath to rub the skin vigorously with a rough towel. This measure, however, may cause irritation and scratching of a tender skin, with a resulting crop of pimples.

Soft water should be used when available and cheap, harsh soaps should be avoided. The skin of the body requires a good quality soap as much as the face. For very irritable skins a superfatted soap may be used, or bran added to the water. The skin is irritated in many people by wool clothing. After a time in addition to the discomfort a crop of pimples breaks out owing to the constant irritation. In these cases the remedy is to wear silk, or cotton, or very fine wool next the skin. While clothing should be sufficient, the healthy action of the skin will be greatly interfered with if too much is worn. On the other hand, a person whose feet, or legs, or hands or arms are constantly cold cannot have a healthy skin.

In certain constitutional affections the skin is involved, e.g. in some of the fevers. In a large number of other instances, however, the skin itself is the original site of disease. For purposes of description, ailments which attack the skin directly may be classed as follows:

1. Inflammatory diseases, such as eczema, herpes, psoriasis, etc.
2. Affections of the glands of the skin, such as seborrhoea, black-heads, etc.
3. Affections characterized by overgrowth or wasting of the skin such as corns and warts, and types of baldness following on atrophy of the hair-roots.
4. Nervous affections, such as itching of the skin, pruritus.
5. Parasitic diseases, such as scabies. See Beauty Culture; Face.

SKIN EFFECT: In Electricity. This is the property of a high-frequency alternating current whereby the current tends to flow along the surface of a conductor, in contrast to a direct current, which is evenly distributed throughout the mass of the conductor. The surface or "skin" effect increases with an increase of frequency.

SKIPPING. Skipping is admittedly one of the best forms of exercise, especially in cold weather stimulating the circulation and keeping the muscles firm and supple.

For ordinary purposes the skipping rope, when held in each hand, should be long enough to reach the ears of the skipper while her feet are resting upon it. This means that when the handles are included the whole should reach to the top of the ears. Unless the rope is this length, the skipper will not be able to keep her knees straight.

For plain skipping the rope should be held so that it almost rests on the ground behind the feet, while the arms are extended to their full width on a level with the shoulders. At a given word, or at the commencement of the music, the rope is twisted backwards, while the skipper springs lightly over it with each revolution. Music is a great assistance to good skipping. The feet should be kept together and the knees straight, while the arms must remain fully extended and the head well up. The arms should be practically still, the rope being turned by movements of the wrist.

Cross Skipping. For the cross skip the arms are folded across the chest, while the rope goes

over as easily as if it were straightforward skipping. The arms, however, must not touch the body. It is generally interspersed with plain skipping, two plain and a cross, or three plain and a cross. The double cross is more difficult. For this the arms are reversed; that is, if the first cross is performed by crossing the right arm over the left, the second, which must follow immediately without any plain skipping in between, must be formed by crossing the left over the right. In a yet more difficult form the double cross is the same cross repeated twice.

Another difficult exercise is the double through or double under. To achieve this the rope has to pass twice under the feet to one spring. Two things are necessary for a successful performance. The rope must be worked up to as high a speed as possible; and the skipper must spring very high in the air to allow the double passage of the rope. This is not as a rule possible with straight knees. If the knees have to be bent the feet should be flung backward, as though the performer were about to kneel down, not forward as though she were about to sit. When well done the action should be a steady rhythm, with the double through performed every sixth step; but this can only be achieved with practice, and needs perfect balance as well as extreme agility.

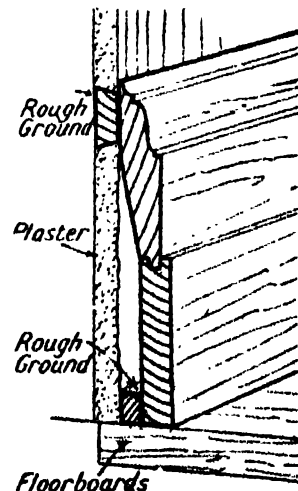
Various dancing steps may be performed with a skipping rope, among which the ordinary gavotte step is popular. Some of the Scottish reel steps and the first of the Highland fling are also effective. The foregoing type of skipping should always be performed to music to ensure perfectly rhythmic movement, and with the rope going from front to back in order to keep the shoulders open and the chest expanded. This adds good breathing to the many other advantages bestowed by the movements.

SKIIRT: Of Beef. This is an inner portion of the buttock, sometimes called the midriff, and is part of the diaphragm. When the skin is removed and the skirt is trimmed, it is cut into pieces and used in place of steak for making puddings and pies. Beef skirt is considered very suitable for this purpose because it is always tender.

The skirt is sometimes made into a stew, and if mixed with ox kidney an excellent dish is the result. Equal parts of beef and ox kidney are used and the procedure is the same as that described for stewed beef.

SKIIRTING BOARD. In house-building this is a thin deal board laid along the foot of a wall to give a neat finish to a room, and to protect the face of the wall from damage. It is stained or painted to harmonize with the rest of the room. The usual width is 2 to 4 in., and thickness $\frac{1}{2}$ in. to 1 in.

Other forms are made in different sections, as, for example, triangular, round, and chamfered, these generally measuring about 2 by 2 in. Other patterns include those with a round hollow, which gives a more



Skirting Board. Section of built-up skirting board, showing also method of fitting it to wall and floorboards.

or less coved effect to the angle between the wall and the floor.

In better-class construction, the skirting board is built up from several pieces or sections, properly jointed together, as in the diagram, which also shows how the skirting is fixed to the wall and the floor. The skirting in this example is composed of two pieces, the lower one being practically an ordinary board with a groove ploughed in its upper edge.

The upper part of the skirting is moulded at the top, the lower edge being tongued and fitted into grooves in the lower timbers. The skirting is attached to the wall by means of strips of rough wood known as grounds. These are generally about $\frac{1}{2}$ in. thick and 2 or 3 in. wide. The grounds are nailed to breeze bricks, wood blocks, or plugs or even by driving the nails into the mortar joints between the bricks.

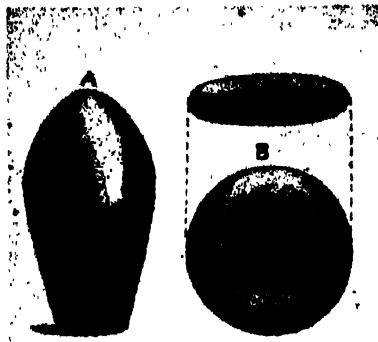
The edges of the grounds which adjoin the plaster work are planed up to an angle, so that when the plaster is applied it acts as a key and assists in holding the grounds and the plaster in position. The grounds are carried right around the room about $\frac{1}{2}$ in. or so below the upper edge of the skirting. To support the lower edge a rectangular or other sectioned strip of wood may be nailed to the floor to provide a stop or abutment for the skirting, which is then nailed to this rough strip.

When fixing skirting boards, the heart side should be used as the face in order that the lateral tendency of the timber to warp will only cause the top edge to be forced more tightly against the face of the plaster. When a single skirting board is used, it should only be nailed along the top edge; the lower edge should be tongued and fitted into a groove cut in the floorboards, so that the skirting board is able to shrink and twist without splitting. The depth of the tongue should be sufficient to allow for shrinkage and expansion without entirely coming away from the joint at the bottom.

Scribing a Skirting. Sometimes, in older houses, when it is desired to fit a new skirting board, it may be found that the floor has settled and is no longer flat. In such a case, the best procedure is to scribe the skirting board to the floor. To do this, it is placed in position and set with its upper edge horizontal. It will then be found to be resting at one or more places on the floor. A pair of dividers is set so that the distance between their two faces is exactly the same as that between the floor and the lower edge of the skirting board.

The dividers are then used as a scriber by moving them along over the surface of the floor, with the upper leg pressing on the skirting board, and keeping the points vertically above each other. By doing this, a line will be scratched on the surface of the skirting board, and its contour will exactly equal that of the floor. The board is then removed, accurately sawn, and finished, if necessary, with a spoke-shave or plane to this scribed line, when, on placing it in position, it should fit the contours of the floor exactly.

SKITTLES. For this game a skittle alley is necessary. This can be made by laying down a number of planks to form a stretch of level flooring, which should be about 12 yd. long and 3 or 4 yd. wide. The game can be played by two persons or by any other even number, provided there are not too many of



Skittles. Fig. 1. A, ninepin. B, flat-sided wooden ball called the cheese

them. In the latter case they are divided into two sides.

The game is played with a wooden ball and ninepins. The former, called the cheese, is flat-sided, and should weigh about 10 lb. The latter weigh from 7 to 9 lb. each, and are set up as shown in Fig. 2. The player stands about 6 or 8 yd. from the pins and his aim is to throw the ball so that it will knock down as many pins as possible. They must be knocked down

by the ball itself, or by a pin that it has caused to fall. Any pin knocked down by a rebound is not reckoned as down. The player is allowed one step forward when throwing.

There are several ways of scoring. One is to make exactly 31 points in the fewest possible throws, each pin knocked down scoring one. If 31 is exceeded the number scored in the last throw is not counted, and another throw is allowed. Another way of scoring is for the players, in turn, to throw at the pins and each one to knock over as many as possible, the one with the highest score winning at the end of an agreed number of throws. Another form of the game

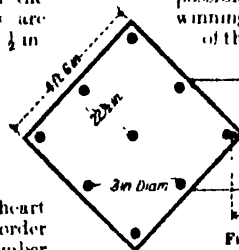


Fig. 2. Diagram showing dimensions of skittle frame and run, with places for the ninepins

is to allow each player three successive throws, his aim being to knock down all the pins in as few throws as possible. If he knocks down all the pins in one throw he scores three points; if in two throws, he scores two points; and if in three throws, he scores one point. If the player fails to do this, he scores nothing. The scores are added up at the end of the game, and the individual or the side with the most to his or their credit is the winner.

There are other skittle games. Some play with only four pins, one at each corner. In Dutch skittles, as it is called, the ball is bowled along the ground, not thrown, grooves being made in the floor for it to roll in. A round ball is used for this game, and the rule is that the centre pin must be knocked down first. This is sometimes known as the king pin, and is often distinguished from the others by its make or size.

SKULL CAP: The Plant. These are uncommon plants of the sage family and bear somewhat helmet-shaped flowers in summer. They are 10 or 12 in. high, and are suitable for the rock garden or near the front of the flower border. The botanical name is *Scutellaria*. Some of the chief hardy perennials are alpina, purple and yellow, albida, white, and baicalensis, purple. Of the greenhouse kinds the best is *Scutellaria moenchiana*.

SKUNK: The Fur. The dark brown glossy fur known as skunk is obtained from an animal of the same name, closely allied to the otter and weasel. It is of remarkable durability, and is of a soft, thick texture. See Fur.

SKYE TERRIER. Although it is naturally a sporting dog, the Skye terrier as a domestic dog shows strong affection, faithfulness and obedience. It has a quick ear and warlike readiness to meet any intruder, large or small. A long-bodied, short-legged



Skye Terrier. An active long-coated little dog. Photo This Fall

dog, with a well-feathered tail, his other points are hidden by his long, hard upper coat, which is perfectly straight and falls to the ground or near it. The head is relatively large, but its form and the face are screened by the long veil which parts only to reveal the black muzzle. The softly feathered ears may be either erect or drooping. The close-set, oval eyes are all but invisible under the veil. The colour should be either blue-grey—light or dark—or fawn with black points. The total length from muzzle to tip of tail is 40 in., height at shoulder is 9 in., weight 18 lb.

SKYLIGHT. A window or set fixed in a pitched roof for the purpose of lighting a room, passage, or space below is known as

a skylight. It should not be confused with a lantern light, which is used chiefly in connection with a flat roof. See Flashing.

Slander. See Label.

SLAT. This is a name given to a long, narrow and thin piece of wood wider than a lath. The pieces of wood forming a venetian blind are called slats, as well as the movable or fixed strips of wood in an open window shutter. The name is given also to the pieces of iron which are fitted from side to side and from end to end on the framework of a bedstead to support the mattress.



Skull Cap. One of the popular names of the perennial *Scutellaria*, a valuable plant for the rock garden or a sunny border

SLATES AND SLATING FOR AMATEUR BUILDERS

A Practical and Economical Method of Roofing

Matters concerning the roofs of houses are dealt with under a variety of headings in this work, such as Corrugated Iron; felt; Roof; Shingle; Thatching; Tile. See also Bungalow; Cottage; Garage; House; Scaffolding; and the articles on the various outbuildings.

Slates are used extensively for covering the roofs of buildings, and when properly laid they form a good covering, being comparatively light in weight and economical in use as compared with many other roofing materials, while their expansion is practically negligible. They resist fire well and their power of absorption is not great, which is an important consideration, because much wet absorbed on

is used; if the slates are to be fixed on to battens, the latter, too, will be nailed to the rafters to suit the gauge.

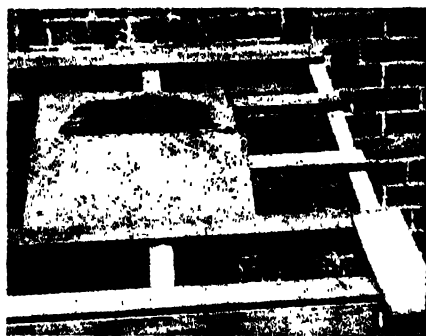
The slates must have the holes punched into them, Fig. 2. The position of the nail hole has to be calculated as follows: Add to the gauge, previously ascertained the estimated lap, and to this add another $\frac{1}{2}$ in., making 13 $\frac{1}{2}$ in. If the Duchess slate is used, that means the holes are punched 13 $\frac{1}{2}$ in. from the bottom edge, or tail, of the slate. No matter what may be the size of slate, the method of calculation is the same.

To facilitate the marking of the slates for boring, a simple gauge may be made from a straight piece of batten to which a stop has been fixed at the proper distance from one end. The trimming of the slates when it becomes necessary, and also the punching for nailing is carried out by the use of very simple tools (Fig. 3). A cutting iron is fixed to a piece of timber on which to rest the slate. Another tool, the slater's axe, is like a chopper

in appearance, but it has in addition to the chopping blade a spiked piece of metal which is used for making the holes in the slates. In making the holes the slate should be struck from the under side. The top side, it will be noted, has the edges chamfered.

distance apart. If boards are used, the gauge is marked with a chalk line.

Laying the Slates. The most important point is to start the slating correctly. Slates are laid beginning at the eaves, that is, the bottom edge of the roof. There must not be any straight joints, otherwise the rain will find its way through the roof. Experience has proved that it is necessary to have a double course at the eaves, as in Fig. 4. The first course of eaves tiles has to be cut speci-



a roof means added weight. Good slates, as a rule, should not increase in weight more than $\frac{1}{2}$ during rainfall.

Slates are used more in towns than in rural areas, where tiles are often a local product. A roof covered with slates does not need such



large timbers as one covered with tiles, and the roof need not be given such a steep pitch as a tiled roof, which is an advantage economically. Slate used for roofing purposes is quarried principally in Wales, Lancashire, or Cumberland, and is split into standard sizes.

The varieties most frequently used are Duchess, 24 in. long and 12 in. wide; Countess, 20 in. long and 10 in. wide; and Ladies, 16 in. long and 8 in. wide. Allowing a 3 in. lap, it will take approximately 122, 180, 280 slates respectively to cover one square, which consists of 100 sq. ft. of roof area.

There are several methods of preparing a roof to receive the slates, the most inexpensive being to nail wood battens across the rafters to the required gauge, as in Fig. 1. A better method is to cover the roof with boarding and then nail the slates direct on to the boards. A more costly method is to board the roof, cover it with tarred sheet felt, then nail the battens on to this, and fix the slates on to the battens.

Finding out the Gauge. It is first necessary to calculate the gauge, i.e., the width of slate exposed in the course. This depends to a certain extent on the kind of nailing that is to be used, that is, whether the slates are to be nailed at the top or in the centre. For example, if Duchess slates are to be used with head nailing, deduct from the length of the slate the lap (which is generally 3 in.) and 1 in. Besides divide the result by 2, and that will be the gauge at which the slates are to be laid, which in the above example will be 10 in. For centre nailing the length of the lap only will be deducted from the length of the slates so that the gauge would be 10 $\frac{1}{2}$ in. Thus, a slightly bigger area is covered when centre nailing

The slates may be fixed to the battens with copper, zinc, or composition nails; it is advisable not to use iron nails, because they will rust away and the slates will fall.

It is necessary to board or batten the roof before slating is commenced. Battens are fixed at the gauge calculated, so that the centres of the battens are the gauge



Slating. Fig. 1. Beginning of slating. Fig. 2. Punching the holes. Fig. 3. Top, slater's axe, for trimming and making holes in the slate; bottom, cutting iron. Fig. 4. Showing double eaves course. Fig. 5. Correct placing of slates, so that successive courses break joint.

Fig. 3, courtesy of Richard Melhuish, Ltd.

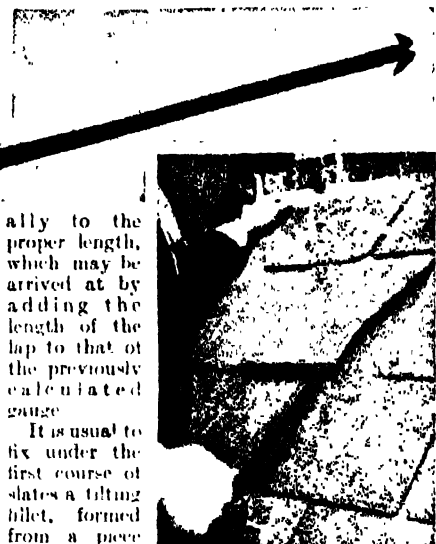


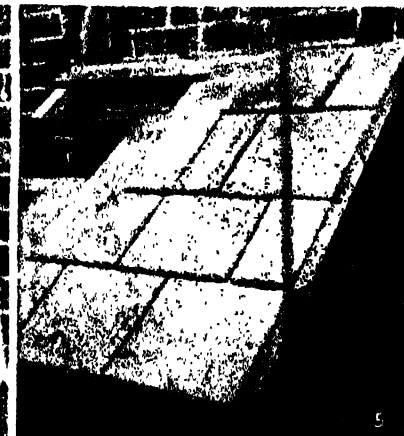
Fig. 6. Slate rip. Fig. 7. How to remove old or broken slates with the tool shown above.

ally to the proper length, which may be arrived at by adding the length of the lap to that of the previously calculated gauge.

It is usual to fix under the first course of slates a tilting billet, formed from a piece of 3 in. by 1 in. stuff cut across the diagonal, and forming one feather edge. This gives the slates a tilt so that their tails press on to it when they are securely nailed. Thus each successive course presses on to the former one, and the slates are kept firm and the roof sound.

The double course completely covers the slates that have been specially cut, the tails of the two courses keeping the same line. Great care must be taken to see that the joints are broken, as in Fig. 5; straight joints will let the water in.

With the double eaves courses fixed there need be no further difficulty. The slates have to be cut at the verge or outer edges of the roof, also to fit the hip or valley should these occur in the roof to be covered. The successive courses of a simple job are illustrated in Fig. 5. It is good practice to put a tilting fillet against the side of any chimney or wall that the roof might butt up against, as this helps to throw



the water on the main roof. The ridge, valleys, and hips of a roof can be finished with lead, or with slates specially formed for that purpose. These are bedded on to their positions by the use of cement mortar.

When, owing to breakage, slates have to be removed the tool known as a ripper (Fig. 6) is used. It is thrust up beneath the broken slate and the sharp hook-shaped blade brought against the nail so as to sever it and free the slate. (Fig. 7.)

SLEEP: Its Value. When the body is growing rapidly, more sleep is required. A newborn child should slumber almost continuously for the first 6 days of its life, and up to the age of 10 years not less than 12 or 14 hours of sleep are necessary every 24 hours. From 10 to 15 years, an allowance of 12 to 10 hours should be given, and up to the age of 25 it is best to sleep at least 8 hours. After that age the matter becomes a more or less personal one. Factors involved are one's own inclination, state of health, and general circumstances.

Owing to the growing complexity and strain of modern life, sleeplessness has become a very prevalent disorder. Often the remedy is simple (*see under* Insomnia).

A common form of sleeplessness consists in waking unduly early in the morning. In such cases the sufferer should get up directly he wakes, the hour of awakening will soon become later. The importance of darkness and quiet is well known, but it is equally necessary that any cause of irritation, such as a decayed tooth or a blistered heel, should receive attention. The commonest cause of insomnia is the stomach. Excessive tea drinking, hurried feeding, and late meals of indigestible food account for many a bad night although no discomfort is present. Finally, never, without medical advice, should drugs for inducing sleep be taken.

Sleeping Out of Doors. Many people, especially those who work indoors in large towns, realize the advantages of sleeping out of doors, not merely for an occasional camping holiday, but as a regular thing. Those who build their houses can plan for one or more sleeping porches opening from the upper floor, but there are many simpler ways in which outdoor sleeping may be satisfactorily arranged in an ordinary back garden.

Waterproof shelter is essential, and aspect is important. Outdoor beds should be protected from the east, whence come the bitterest winds and the morning sun, which is apt to wake the sleepers unreasonably early in summer. With a south-west or west aspect the roof must project several feet beyond the foot of the bed, or rain will drive in. A veranda opening out from one of the sitting-rooms makes an ideal improvised sleeping porch, though if exposed to the rainy winds it may need a roof extension. The east or north-east side of an outdoor bedroom, if open, should be filled with glass, wood, or removable screens of canvas, according to the nature of the structure.

For comfortable and regular sleeping out proper bedsteads are essential, and can be moved out from the house. Naturally, expensive ones should stay indoors, the cheaper wooden, iron and camp beds being placed in sleeping shelters. For a veranda which is wanted in the daytime for lounging and afternoon tea, the best equipment is a camp bedstead or light make of divan bed supported on legs with castors.

In damp weather the person who makes the beds should throw right over them camping ground-sheets, waterproof covers, or a collection of old Mackintoshes, to keep out the moisture. Particular care should be taken that the pillow is well protected, though experience has proved that even those who sleep out in winter as well as summer suffer in no way from damp bedclothes. Besides being extremely

pleasant regular outdoor slumbers have been proved to be particularly beneficial to nervous and anæmic people. *See* Hammock; Insomnia; Nightmare; Sleepwalking.

SLEEPING BAG. A sleeping bag is a useful article of equipment for campers out, yachtsmen, or even for those who sleep out in the garden during the summer, while for small children in their perambulators it is invaluable. The first type can be procured from most athletic outfitters. It may be made of fur, camel hair, or some waterproof material, and usually has a flap which can be fastened down over the head of the occupant. This arrangement also enables the bag to be used as a valise when packing up for the next stage of the journey.

An adequate sleeping bag may be made by the simple expedient of folding a blanket in two and stitching it up at the side and one end. It is not necessary to cut the blanket for this, which means that it may serve its purpose as a bag for as long as it is needed, and may then be unstitched, washed, and returned to its normal use. For this purpose handstitching is recommended as being easier to unpick. The bag should be long enough to come well up to the sleeper's armpits, and, if required for really cold weather, only the head should extend beyond the bag. Some people prefer to have the top foot or foot and a half left unstitched, so that they can move their arms freely, or can turn the top edges down and over if they get too hot in the night.

SLEEPING DRAUGHT. A sleeping draught may be prescribed and obtained from the chemist made up ready for use, or the hypnotic ingredient may be prescribed and directions given regarding the preparation of the draught. It is often advised to give the draught in hot milk or gruel, except in the case of an evil-tasting substance like paraldehyde. No patient should make up his own sleeping draught nor should hypnotics be within his reach, as a patient desperate from sleeplessness might easily take an overdose. *See* Hypnotic; Insomnia.

SLEEPING SICKNESS. The disordered condition known as sleeping sickness is the last stage of trypanosomiasis, or infection with some trypanosoma. This is a protozoal parasite which first exists in the blood but later finds its way into the cerebro spinal fluid. The disease is found in West and Central Africa and in Brazil, and is transmitted by various species of tsetse flies.

African sleeping sickness must not be confused with encephalitis lethargica, the so-called sleepy sickness, outbreaks of which have been noted in Great Britain since 1918. *See* Encephalitis.

SLEEPWALKING. This troublesome habit is more common among children and as a rule a child grows out of it, but in some cases it lasts on into adult life.

Sleepwalking resembles the hypnotic state. The somnambulist has no recollection of what he does when he walks in his sleep. The sleeper gets out of bed and moves about. In most cases he merely gropes around the room, and, partially awaking, returns to bed. Sometimes, however, he leaves the room, and, in rare cases, gets out of the window.

Among the most common causes of sleepwalking in children are over-pressure at school, and going to bed in a state of anxiety from this or another cause. Attention should be paid to the diet and to the bowels. These persons should not eat a heavy meal just before going to bed, nor go with an empty stomach. If there is any costiveness, a dose of aperient medicine should be given. Exercise in the open air is very necessary. The bedclothes should be light, and the room well ventilated.

When a person is found walking in his sleep it is better not to awaken him, but to lead him

quietly back to bed. Danger in awakening a sleepwalker is largely a matter of where the sleeper happens to be at the moment of awakening. The bedroom door should be fixed so that it will not open sufficiently to let the sleepwalker pass through, the windows should be secured in such a way that they will not open wide. A good plan is to put a piece of cold cloth at the side of the bed, which may awaken the sleeper as he steps on it. When a child is much given to the practice it is always best to take him to a doctor. *See* Sleep.

SLICE. This word is used for the silver or silver-plated knife or server with a thin broad blade that is employed for serving fish. It is also frequently used to describe the kitchen implement employed to lift fish, fried eggs, rissoles, etc. from the frying pan without risk of their breaking. Such a slice is usually of aluminium or enamelled metal and has a broad thin blade perforated in order to allow surplus grease to escape back into the pan.

SLIPPERS. This word is used to indicate any form of very light shoe which is worn for comfort indoors. Slippers can be of leather, with or without a heel and fur lined, of felt; quilted satin, raffia, or other material. One form is the mule, which is simply a toe-cap of material attached to a heeled and padded sole. An important point about this kind of shoe is that it should slip on and off easily and be held in place without fastenings. *See* Moccasin.

Slipperwort. This is the popular name of *calceolaria* (q.v.).

SLOE. This is the fruit of the blackthorn (*Prunus spinosa*), the progenitor of the garden plum. A double-flowered kind named *spinosa* is worth growing as an ornamental shrub.

Sloe Gin. This cordial can easily be made at home from the following recipe: To 1 pint sloes add 1 lb. sugar. Half fill a bottle with the sugared fruit and fill up with gin. If the sloes have been previously pricked, the liqueur should stand for 2 or 3 months before drinking, otherwise for 12 months. Properly matured sloe gin should be the colour of full-bodied port wine. A cocktail known as sloe gin rickey is made from $\frac{1}{2}$ gill sloe gin with ice and the juice of half a lime squeezed into it. Fill up the glass with cold soda water.

The following is another recipe: Take 3 lb. sloes, $\frac{1}{2}$ gallon unsweetened gin, 1 $\frac{1}{2}$ lb. Demerara sugar, and $\frac{1}{2}$ oz. bitter almonds. Wipe and stalk the sloes, prick them well with a needle in several places, and put them into a large stone jar. Add the gin and sugar and then the blanched and skinned almonds, cork the jar tightly, and then shake it vigorously. Shake it once daily for about 14 weeks, at the end of which time it may be strained and bottled for use.

SLOP BASIN. This is a basin placed on the table at breakfast and tea to receive the dregs from the cups. Slop basins are usually part of a breakfast and tea service.

SLOP PAIL. An enamelled pail for use in a bedroom not fitted with running water. It is for containing and carrying away general slops. A close-fitting top, or cover, prevents any splashing of the contents while the slop pail is being removed for emptying.

SLUG. This is one of the chief garden pests, and can do immense damage, especially among seedlings and young plants. It is generally most troublesome on wet and heavy land; soil which is kept in a good state of cultivation by digging, forking, and hoeing is not, as a rule, badly infested. This pest is most harmful in wet weather. It can be trapped by means of orange peel, bran, pieces of potato or carrot laid down on the soil and examined frequently.

Scatterings of lime, soot and alum are useful. Ashes placed round about plants when fresh growth is pushing through the ground will often keep away slugs. Zinc collars pressed into the soil are used to protect choice rock garden plants.

The best remedy is to dissolve one pound of commercial aluminium sulphate in one gallon of water and a double handful of lime in four gallons of water. The two solutions are then thoroughly mixed together and applied to the soil infested by the pests.

SLUG WORM. Often called the shiny grub, this larva of a species of sawfly is destructive to leaves of the pear, and sometimes attacks the plum, peach, and cherry. The sawfly itself is shining black with dusky wings, and the larvae a quite small shiny black slug with a large head. Eggs are deposited on the upper surface of leaves during June, hatching out late in the month with grubs that are white, then yellow and finally covered with black slime. As soon as grubs are seen they should be given a dusting of powdered lime.

There is also the rose slug worm which destroys the upper skin of leaves, and these may be recognized by their colouring: pale yellowish green, orange head, and dark marking down the back. Two broods are produced, one in June and another in September, or earlier. The bushes should be sprayed with hellebore wash or a nicotine insecticide. See Insecticide.

SMALLPOX. One of the most contagious of all diseases is smallpox, or variola. It is an acute infectious disease accompanied by fever and an eruption of papules or pimples on the skin, which change into pustules and then into scabs. The great preventive is vaccination.

It is caused by the entry of a virus into the breathing passages, and it is spread by small seeds, shed like dust from the skin at the height of infection and during convalescence. The incubation period is 10-14 days from contact.

Segregation of the patient is essential, and the disease is notifiable (see Notification). The patient has a chill, and the temperature rises to 104 deg. F. In children there may also be convulsions. The suppurating rash, which is a characteristic feature, may leave permanent pitting of the skin.

There is no specific remedy for the disease when once it has developed, so efforts must be directed to maintaining the patient's strength and preventing the occurrence of serious complications.

In the early stages the diet should be restricted to milk alone. The skin, which should receive great attention throughout an attack of smallpox, should be sponged daily with tepid water. The face should be covered with a mask of lint kept moist with ice-cold water, or smeared with carbolic vaseline. When the pustules rupture, dilute carbolic lotions should be applied. Later, zinc ointment with 5 per cent. sulphathiazole should be applied to the raw areas when the crusts have fallen off.

The mouth should be kept thoroughly clean by frequent swabbing with glycerin of borax. Care of the eyes will reduce the likelihood of serious inflammation; they should be irrigated frequently with boracic lotion, and covered with cold compresses to reduce oedema.

Sleep must be ensured, if necessary, by sponging the patient, or by the use of drugs such as chloral or potassium bromide. Stimulants are often required, and alcohol may be of great value. As in all prolonged fevers, skilled nursing is of vast importance.

A smallpox patient is infectious from the onset of fever and other symptoms until convalescence. The most dangerous period is

from the outbreak of the eruption until the scabs have dried up. The infectious material exists in the blood and secretions, in the exhalations from the lungs and skin, but chiefly in the pustules, which dry and fall off in fine particles. It is thus possible to become infected in a railway carriage, or any place of public resort. Overcrowding favours the spread of smallpox, as does bad sanitation.

If an epidemic is raging smallpox may be strongly suspected when there are sudden severe pains in the head and back, with vomiting and high fever, following a shivering fit. See Vaccination.

SMELLING SALTS. The inhalation of ammonia has a stimulating effect of much use in the relief of faintness and headache. The ammonia is derived from ammonium carbonate or from strong solution of ammonia, and the preparation is made agreeable by the addition of perfumes. Sometimes carbolic acid or eucalyptus oil is added to obtain an antiseptic effect in influenza, common colds, hay fever, etc.

When liquid ammonia is used in the preparation it should be thoroughly soaked up by a piece of sponge, asbestos, or some other absorbent material, as the liquid, if spilt on some coloured fabrics, will stain them. The pungency of strong acetic acid serves the same purposes as smelling salts. See Acetic Acid; Fainting.

SMELT: The Fish. A small, delicately flavoured fish, the smelt needs to be cooked as soon as possible after it is caught, otherwise the flesh loses its firmness. To clean it, press out the milt made through a slit made just below the gills, cut off the latter, and then wash the fish quickly.

Frying is the usual method of cooking smelts, but they may also be stewed, and in this form make a good dish. To fry them, clean and dry the fish, then coat them lightly with seasoned flour. Bruise over them a little beaten egg, roll them in bread crumbs, and then fry them in a pan of smoking hot fat until they are of a golden brown colour. Drain them on paper and then serve them hot garnished with parsley and accompanied by plain white sauce.

For stewing, cut the heads off the fish and then lay the latter in a small heatproof dish containing enough white stock to cover them. Add seasoning to taste, put on the cover of the dish, and cook the fish in the oven for about 1 hour. See Fish.

SMILAX. These are hardy and green-house evergreen climbing shrubs and plants. The long slender trails of smilax (*Asparagus medeoloides*), so much in demand by florists for decorative purposes, is a greenhouse plant. It is easily grown from seed, planted in a compost of loam, leaf mould and sand and trained on string or wires. Of the hardy kinds the chief one is *aspera*, a vigorous climber suitable for covering a rough fence.

SMOCKING: In Needlework. Smocking is formed by gathers which are drawn into vertical pleats by running gathering threads at certain distances from each other. The latter depend on the design, and are used as guides for spacing, when the decorative part is begun. The stitches on the surface of the pleats are the ordinary sewing and embroidery stitches. They all appear on the surface of the work, except in honeycomb smocking,

when only the stitches that connect the pleats can be seen on the right side, the rest of the stitch being run inside.

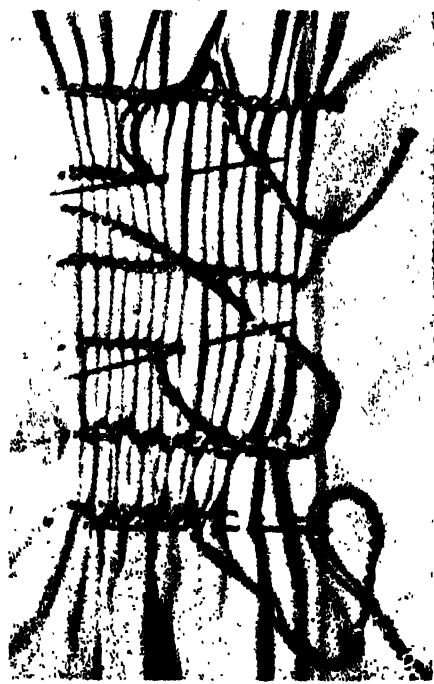
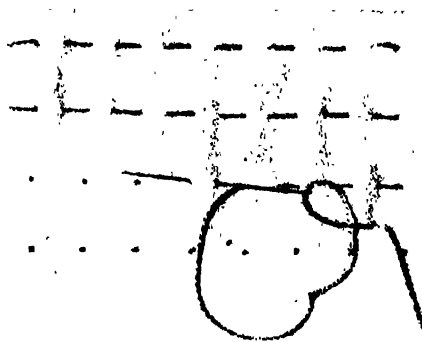
This form of work is always useful, as well as decorative, on children's clothes, and its popularity never dies out. It is particularly useful on the wrists and at the necks of frocks and of small boys' suits, as it is elastic and will stretch easily over the head and hands. Smocks are also exceedingly serviceable as overalls, and for gardening work, when made in holland, linen or heavy Shantung silk.

Methods of Working. Mercerized cottons may be employed for smocking easement cloth and similar goods, embroidery cottons for muslin and other white goods, linen embroidery threads for soft linens and twisted embroidery silk on washing silks.

Smocking transfers can be bought at almost any fancywork shop, and these consist of sheets of paper with dots marked in transfer ink, which are transferred to the material by means of a hot iron. These dots are spaced evenly, about $\frac{1}{8}$ in. apart, along the row and the rows about 1 in. apart. If a transfer is not at hand, a card with holes at the correct intervals through which the point of the needle is inserted makes a permanent marker. Before using either the transfer or a marker the material should be stretched on a drawing-board and secured with drawing pins.

To gather, begin at the top right hand corner, and put a good knot at the end of the cotton; make a little back-stitch here to prevent the knot from going through. These

gathering threads are drawn out afterwards, as they only serve to hold the pleats together. Put the needle down through the material again half way between the first and second dots, and out again at the second dot. This will result in a flat stitch lying over the first half of the space between the first and second



Smocking. Fig. 1. Running the gathering threads along dotted lines. Fig. 2. Four different stitches used, all worked from left to right.

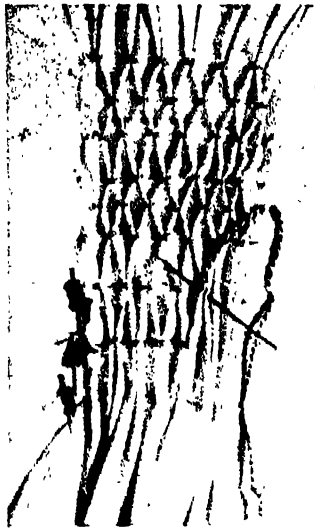
dots. Continue this to the end of the row. Fig. 1 shows two gathering threads completed and the third row with the needle in position. Repeat this gathering thread on all the rows of dots. When they are all finished draw up the top thread and secure the latter round the pin at the left side as for ordinary gathering. Fig. 3 shows three of the pins with the cotton twisted round. After drawing up the top row stroke the pleats into position. Draw up, secure and stroke each row, when the work will be ready for the smocking stitches. When the work is begun the threads can be released a little but must still be fastened round the pins while working. It is necessary to draw the pleats up tight at first to set them in an even position. Fig. 2 shows specimens of four different stitches, from which many pretty designs can be formed.

The top row shows ordinary stem stitch completed and the second row the same stitch in progress, taking up the stitch on the top of a pleat, and bringing the needle out under the cotton. If the work is held sideways the thread is thrown over to the left of the needle. Note that the work proceeds from left to right. The third row shows crewel outline stitch pleated and the fourth row crewel stitch in progress. The only difference is that the loop of thread is thrown over to the right in working and the needle comes out above the thread. The fifth row of the same figure shows alternate stitch, that is, outline stitch for the first stitch and stem stitch for the second one, repeating these two movements alternately across the row. The last row on the same figure is herringbone stitch, taking the first and second pleats together for the first top stitch, and the second and third pleats together for the next lower stitch; for the top part of the next cross take the third and fourth pleats together and continue across the row. For each new stitch take the second pleat of the last pair, together with a new pleat.

In the same way all the feather-stitching patterns can be carried out in this work, and the 3 stitches in Fig. 2 can be worked in zig-zags or waves to form new designs. In Fig. 2 the gathering threads are fastened off at the back of the work for the purpose of illustration, but when they are cut out entirely the smocking expands, causing the pleats to stand up evenly and giving a much prettier effect. The gathering threads should not, however, be removed entirely until the work is completed.

Honeycomb Design. Fig. 3 shows the honeycomb design. After setting the pleats as described above, join the thread to the top left-hand pleat, as the work proceeds from left to right, and take a stitch through the second and first pleats. Insert the needle in the second pleat just where the last stitch was made, slip the needle down under the pleat and bring it out on the second line of dots for the big honeycomb or halfway between the two lines for the smaller honeycomb.

The two sizes are illustrated on Fig. 3. This long stitch running through the pleat must be entirely hidden. Take a back-stitch through the third and second pleats, slip the needle under the third pleat and bring it out on the first running line again. Take a stitch through the fourth and third pleats, and slip the needle down through the last pleat to the second line once again. Reference to Fig. 3



Smocking. Fig. 3 Honeycomb design shown in two sizes

will show clearly how succeeding rows are formed, always taking the second pleat of the last pair with the new pleat in the middle row, to open the honeycomb. The third row is a repetition of the first row, which closes the honeycomb at the lower end. The needle is shown in position taking a back-stitch through two pleats.

Many pretty designs can be made with honeycomb stitch, such as vandykes, gradually tapering the pattern off to a point, with only one diamond in the last row and it only requires a little ingenuity for the worker to show individual taste, especially if she has a working knowledge of a number of embroidery stitches. See Embroidery, Feather Stitch, Herringbone Stitch.

SMOKE TREE. Smoke tree is the common name for *Rhus cotinifolia*, a hardy deciduous shrub, otherwise called sumach. It is suitable for the mixed shrubbery or for the lawn, and bears foliage which assumes a rich orange-crimson shade in autumn. There is a similar species, *cottinus*, known as the smoke bush and this is perhaps more beautiful. The smoke tree should be planted in good ordinary soil during autumn, and increased by layerings or cuttings of ripened shoots during the same period. See *Rhus*.

SMOKE WOOD. This is another name for *Clematis vitalba*, the Traveller's Joy of chalky lands and hedgerows. While it is useful for covering old tree-stumps, banks, and trellises, and is popular on account of its feathery, smoke grey seed heads, its main use is as a stock on which can be grafted choicer kinds of *clematis* (q.v.).

SMOKING. There are no certain rules as to the quantity of tobacco that should be consumed in a day or a week, as this naturally depends on the individual smoker. Factors to be reckoned with are the condition of his heart, nerves, and digestive organs, the nature of his occupation and the amount of physical exercise, particularly open-air exercise, which he or she is in the habit of taking. Generally speaking, a fair average for a pipe-smoker is 4 oz. a week; many use less.

When smoking is indulged in to excess, it is most frequently in the form of cigarettes, and if inhaling is practised at the same time the danger to health is very real. Those who suffer from anaemia should be very careful to smoke in moderation, and to avoid inhaling, and if there is any weakness of the heart unlimited cigarette smoking will cause trouble. Cigarettes offer the cheapest form of smoking only to those who strictly limit the number they consume in a day.

Strong tobacco may contain as much as 9 per cent of nicotine, but the amount is usually less, and in a mild mixture it may be as low as 2 per cent. A person can only judge whether he is smoking too much by the effects produced. These are indigestion, generally acid indigestion with flatulence, reduced appetite, more or less mental depression, some reduction of the muscular strength and more fatigue than should be after exertion, and perhaps dimness of sight. Sore throat (smoker's throat), with huskiness of voice and a short irritable cough, is not infrequent.

If the tongue becomes sore, or the heart palpitates, cease smoking for a time. These are

danger signals that should not be disregarded, and any dimming of the sight is another. People who should not smoke at all are those whose heart or nerves are weak, suffer from relaxed throat, or a tendency to bronchitis or consumption. Smoking is specially injurious to growing lads.

All smokers should be careful to wash the teeth morning and night. The tobacco poison clings for a long time to the mouth, and if one goes to sleep without removing it he will swallow some portion of it in the night. The best mouth cleanser for smokers is water in which bicarbonate of soda has been dissolved, the proportion being a teaspoonful to the pint.

Smoker's Heart. Nicotine in excessive quantities acts as a heart poison, and anyone who smokes immoderately may suffer from unpleasant symptoms.

In extreme cases the action of the heart becomes irregular, attacks of palpitation occur, there is giddiness, and in pronounced cases actually fainting. If the smoking be stopped the heart recovers very quickly, as a rule in a few weeks' time. No other treatment is required in the great majority of cases.

Smoker's Throat. A chronic state of inflammation of the pharynx, though not very severe, caused by the excessive use of tobacco, is sometimes called smoker's throat. Some forms of tobacco are more irritating than others. Pipe smoking is thought to be chiefly liable to produce it.

The symptoms are a husky voice, frequent hawking, and very often a short cough. The only cure is a reduction of the amount of tobacco consumed. Before going to bed every smoker should gargle the mouth and throat with a solution of bicarbonate of soda in water, $\frac{1}{2}$ teaspoonful to $\frac{1}{2}$ pint. See Cigar, Cigarette; Nicotine; Pipe; Throat; Tobacco.

SMOKING: Of Meat. Whilst meat and fish can be cured by being merely dried after salting, they possess a superior flavour if the drying is supplemented by smoking them in the fumes from a wood fire. The best results are obtained by burning green birch, beech, or oak wood, oak sawdust or broom tops. Occasionally juniper wood is employed to impart a special aromatic flavour to hams and bacon.

When meat is to be smoked it must be well dried after removal from the pickle, by hanging it in a cool, well-ventilated place; there should be plenty of air, but no direct draught on the food. Salmon is sometimes pickled with a mixture of saltpetre, bay salt and coarse brown sugar before being smoked, but after pickling it must be rubbed with common salt and then dried. Haddocks and herrings are merely salted and dried before being exposed to the smoke.

The smoking of butcher's meat or bacon is usually done in places constructed especially for the purpose, but it is possible to smoke small hams and portions of bacon at home if a wood fire may safely be built on the stone or brick floor of an out-house. The meat should be suspended sufficiently high above the fire to smoke without getting cooked. Ham and bacon take from 10 days to 1 month to be properly smoked.

Fish is easier to manage as the curing may be accomplished in about 12 hours after exposure to the wood smoke. To smoke small fish a tank or cask with both ends open may be turned on end on the brick floor of an out-house and a good layer of sawdust placed inside. Into the sawdust a red-hot iron should be inserted. The fish should then be hung on an iron rod across the top of the cask and smoked in the fumes.

SMOKING ROOM. In most modern houses where smoking is allowed in every room there is no special smoking room.

Where a sitting-room is reserved for this purpose, the chief characteristics should be cosiness.

Rugs may be preferred to carpets as they can be taken up and shaken frequently to rid them of tobacco ash. Suitable materials for upholstery would be leather, oil baize, or mohair. A wide, deeply padded angle seat covered with some dark material—narrow striped or plaid effects are good, the stripes toning with the colours in the rugs—and a few large, plainly piped cushions to match, make a cosy treatment for a warm corner.

Smokers' tables should be solidly made, they stand more firmly, and are more useful if shelved after the fashion of a book table fitted with small cupboard sections. A cupboard or cabinet for drinks and glasses—in a panelled room this cupboard might be built in—a card table flat-topped writing desk, four small chairs of solid make and a bookcase or shelves according to requirements would complete the necessary furnishing. Lights should be shaded, and reading lamps are essential. Pictures are usually confined to a few etchings, engravings and sporting prints.

SMOOTHING: In Wireless. The process of eliminating irregularities from electric currents used in a radio receiver. Such irregularities would not interfere with the normal working of a domestic electric appliance or light, but even slight ripples can be magnified in the amplifying currents of a receiver and heard as loud humming or crackling. In other words, the supply for this must be made very smooth. This is done with combinations of chokes and condensers. In the case of Alternating Current (a.c.) mains supplies the smoothing is carried out subsequent to rectification.

SMOOTHING PLANE. The most usual type is about 8 in. long, which is enough for ordinary finishing purposes. The method of assembling and adjusting is much the same as for a jack plane, except that to loosen the plane iron the back of the plane is tapped with a hammer or mallet. No handle is required. The plane is grasped at the back with the right hand, the left hand is placed on the front, and is used at the end of the stroke to pull out long shavings. See Plane.

SNAIL: In the Garden. As a rule snails are given diet of living plants of all kinds, and are therefore enemies to the gardener. They usually feed at night or at dusk, but in damp weather, or after heavy rain, they may be found in numbers in the daytime.

Dry dressings of any irritant may be put down to kill them. One of these is a mixture of lime and caustic soda, 4 parts of caustic soda to 96 of lime, well mixed. Other dressings are soot and lime, and salt and lime. Two or three dressings should be given, at intervals for a few days, and they should be renewed after rain. These dry dressings should be applied after sunset, or else very early in the morning. See Lime. Slug.

SNAKE ROOT. The snake root is an attractive hardy herbaceous perennial. It grows 3 ft. or so high, and in July and August bears small white flowers on long, graceful stems. They flourish in ordinary well-cultivated land, do not mind slight shade, and are increased by division in autumn. The best are simplex, japonica and racemosa. The botanical name of snake root is *Cimicifuga*.



Snake Root. White flower spikes of the species japonica

SNAKE'S HEAD. This is the popular name of one of the fritillaries (*Fritillaria meleagris*), a charming spring bulb with beautifully chequered flowers. See Fritillary.

SNAP: The Card Game. This popular indoor game is played with specially prepared packs of cards. These are of various sizes, but the general principle is that they shall be in fours, each four bearing the same figure. No special number of players is necessary. Two can play, but it is better to have four, five, or six. The cards having been dealt, the players, holding them face downward in their hands, play in turn. Each places his played cards face upward on a heap in front of him. When two similar cards are exposed together any player can call snap, and the one who calls first obtains all the cards which lie beneath the two snapped ones. So the game continues until one player has secured all the cards.

In case a player calls snap when there is nothing to snap on the table, the cards in front of him go to a pool. Then they lie until a card similar to the one on the top thereof is exposed, whereupon, if a player calls snap pool, he receives those in the pool.

Special packs of cards may be bought for this game, or it may be played with ordinary playing cards. The former include cards made with a great variety of comic or artistic designs and are usually more popular with children than ordinary packs. They have an added advantage in that they save a good pack of playing cards from the rough usage which is almost inevitable in this game. If an ordinary pack is used the snapping will be between cards of the same value, for instance, one two and another, one king and another, and so on. If a more complicated game is required the snapping may be from one to two, two to three and so on.

The game can be played without any calling of snap. In this case a small object—say, a shell—is placed in the centre of the table and, instead of calling snap, the player places his hand on this. This prevents any doubt as to the winner. In calling it may be difficult to say who called first, but only one hand can touch the shell at once.

Animal Grab. There are some amusing variants of the game, among which may be mentioned animal grab and grimace snap. In the former each player chooses to be some animal with a distinctive cry, e.g. a dog, cat, pig. When two players turn up similar cards, instead of saying snap, each has to make the noise of the other person, and the one who achieves it first wins the cards. As the tendency with most people is to make their own noise, while searching vainly in their memory for the one belonging to the other person, the effect is usually very ludicrous.

Grimace snap is extremely simple. Instead of snapping,

the players are under contract to make each other laugh, to which end they may do anything except speak. In this way the player with the most mobile face stands to win.

SNAPDRAGON: The Plant. This is the popular name of *Antirrhinum* (q.v.), a favourite garden flower grown in British gardens in quantities for summer bedding.

SNAPSHOT: In Photography.

Snapshots may be described as amateur photographs of the more or less limited kind that are possible to the owner of an inexpensive hand camera with only one shutter speed. This is usually about 1/30th sec., though often marked, if marked at all, as 1/25th sec. It is possible, of course, to take snapshots with any camera that has a shutter working at one or more speeds in addition to time exposures, but the beginner in photography is generally limited to snapshots.

So long as the light is strong enough to give a fully exposed film or plate with an exposure of 1/30th sec., the amateur will have little difficulty on this score, but it is essential that he should recognize clearly this limitation. Only a proportion of subjects which the amateur usually wants to photograph are sufficiently well lighted to give good bright prints from snapshot exposures with cheap cameras with moderately good lenses, although the faster films available permit somewhat wider latitude in exposure.

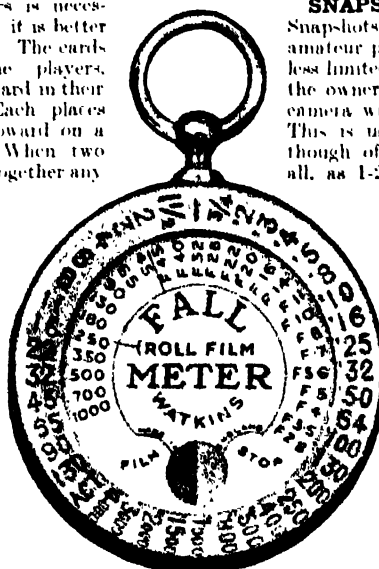
With a camera whose lens works at about f.11, sunshine, or sunlight with very thin clouds, in the summer is essential to good results. Winter or early spring sunshine is deceptively bright, as a test with an exposure meter will demonstrate. If the lens is marked f.8, bright midday winter sunshine or slightly dulled summer light will give reasonably good results. As the strength of the light is the prime factor in snapshot photography, the amateur will be well advised to purchase an exposure meter.

The Watkins Fall Meter (Fig. 1), for roll films and other cameras, is inexpensive, and indicates by a simple test whether the light is strong enough for a snapshot. It is supplied with special dials suitable for particular Kodak and other cameras. If the meter shows that the light is too weak, it is a waste of film to attempt a snapshot. The Fall exposure meter is a modification of the general Weston's meter shown in page 436. Full instructions for its use are given with the meter.

In snapshot work it is often of importance to know or be able to calculate the speed of moving objects in order to estimate the maximum exposure possible without showing movement or blur in the negative.

Movement relative to the camera's focussing screen is the fundamental consideration. If the object is approaching the camera from the front the movement of the image on the screen will be small relative to the actual movement of the object, while the image movement will increase in proportion to the angle that the object makes with the camera, the maximum obviously being when the object is moving straight across the front of the camera.

Thus it will often be possible to secure a good snapshot of a moving object if the photographer can get into a position at a small



Snapshot. Fig. 1. Exposure meter for giving reliable indication whether light is strong enough for a snapshot
(Courtesy of Watkins (Limited))

angle with it. In the diagram (Fig. 2) the moving object, A, is supposed to be a motor car travelling at 20 miles per hour, or about 30 ft. per sec. The camera being at B, 50 ft. away, the longest exposure possible with a V.P.K. if movement is not to show, is 1-100th sec. With the camera at C it would be, roughly, about 1-50th sec., while at D, an exposure of 1-25th sec. might give good results.

As a basis of calculations of this sort it is to be assumed that during the exposure the image must not move more than 1-100th in. on the focussing screen if it is not to show blur in the negative. For a lens of 6 in. focus, which may be taken as the distance between lens and focussing screen, an object 100 ft. from the camera is 200 times the distance from the lens that the image of it on the focussing screen is from the lens, 100 ft. being 200 times 6 in.

Therefore a moving object of 1-100th in. seen on the focussing screen is equal to an actual movement of the object of 2 in., and this is the maximum movement permissible during the time the shutter is open. Thus we can calculate maximum length of the exposure. At 20 miles per hour the object, say, a motor car would move about 30 ft. in 1 sec., or 360 in. As it must not move more than 2 in. during the exposure, the time is 2-360th or 1-180th sec.

As the longer the focal length of the lens the larger the image on the screen, and the greater its movement, a short focus lens such as is usually found on snapshot cameras will permit longer exposures. With a small camera of the vest pocket Kodak type where the distance between lens and film is about 3 in., the exposure in the example given will be doubled, i.e. 1-90th sec., or, to be safer, 1-100th sec. These calculations assume that the object is moving across the line of vision, i.e. at right angles to the camera. If other positions can be taken up, as indicated in Fig. 2, the exposure times will be reduced accordingly.

Mr. Walter Kilbey in his book "Advanced Hand Camera Work" gives the following exposures for certain types of moving objects. With a lens of 5 in. or 6 in. focus the objects being not less than 20 ft. from the camera, for groups standing in the street, children at quiet play, etc., 1-50th sec.; for children actively at play, athletics and less rapid sports 1-200th to 1-600th sec.; for rapid games, cycling, racing, horse jumping, 1-500th to 1-800th sec.; for divers, football, etc., 1-700th to 1-1000th sec.

The exposures given are of course the maximum possible if movement is not to show and have no relation at all to the aperture of the lens, the strength of the light or the speed of the plate or film. If the camera lens is not fast enough, i.e. of sufficiently large aperture, for the strength of light on a particular occasion, or the speed of the plate, then a snapshot is hopeless, because exposure will be insufficient in order to give a properly exposed negative.

Sneezewort. See Helonium.

SNEEZING. The process of sneezing is a provision of nature by which irritating substances are expelled from the upper air passages. Ordinary causes are the presence of irritating matters, such as snuff, pepper,

dust, etc., in the air passages. In hay fever the pollen of grasses produces violent and distressing sneezing.

Sneezing is one of the earliest symptoms of a cold in the head, of influenza, measles, and hay fever. If measures be taken against a cold in the head as soon as sneezing occurs further development may be prevented.

When the affection is troublesome and prolonged, it may often be stopped by smelling camphor, snuffing menthol snuff, or fine powder of bismuth carbonate. Pressing the tip of the tongue against the back of the central upper teeth sometimes arrests sneezing.

SNIPE: How to Cook. This small bird is in season from October or November up to the following February.

To find out whether the bird is young, the feet should be examined, and if these are not soft and tender the bird is old. The long bill also will indicate whether the snipe has been kept too long, as it must not be moist. Take many small birds, snipe is best when dressed without removing the trails, but the gizzard should always be taken away before the bird is cooked. It is trussed with the head left on, and when it is plucked the head and neck feather should be carefully removed, also the eyes must be picked out. The snipe is then singed and trussed.

To truss snipe, cut off the claws and then twist the legs so as to force the feet behind the thighs. Then run the sharp bill through the thighs and body as if it were a skewer. Then a noose of string round the bend of the leg joints, across the lower part of the breast, then bring both ends up to the head, pass round that and the tip of the bill and tie at the back. Cross the feet, cover each bird with a slice of fat or butter on with string, and roast as described under the general heading Game in this work.

Snipe Pie. Prepare 4 to 6 snipe and cut them in halves. Chop very fine 1 lb. rump steak and 6 oz. fat bacon, and pass twice through a mincer. Cream 3 oz. margarine, season it, add 1 teaspoonful grated nutmeg, the juice of half a lemon, and the same of orange. Work in 3 oz. fine breadcrumbs and 2 yolk of egg. Mix in with these the meat and bacon and moisten to a paste with white wine.

Make this forcemeat into balls. Lay at the bottom of a pie-dish 1 lb. rump steak and 1 lb. bacon cut in strips and rolled, lay on these the portions of snipe, with the forcemeat balls arranged between. Season well, and three-parts fill the dish with stock. Cover over with good rough puff pastry, glaze, and bake 1½ hours.

Snipe Pudding. Make a good crust with kidney suet and fine flour well salted, then prepare 4 snipe and cut in halves. Reserve the livers and the trails. Sprinkle a little lemon juice over the birds, and season them with salt and cayenne pepper. Peel and slice a Spanish onion, and fry it a light fawn in 2 oz. margarine, stir in 1 oz.

flour, 1 lb. prepared and chopped mushrooms, 1 teaspoonful sifted sweet herbs, 1/4 of a clove (chopped), a good pinch of grated nutmeg and seasoning to taste.

Strain the ingredients in the pan for 2 min. then add 1 pint of well flavoured stock to which (if desired) 2 wineglasses white wine have been added. Simmer for 10 min., then add the liver and the trails. Pass the contents of the pan through a wire sieve into a basin. Line a pudding basin with the suet crust, add the snipe and the parer, and a little more liquor if needed. Put a lid of paste over the pudding, tie it up and steam for 1½ hours. The paste for this pudding must not be very thick. The pudding can also be boiled. See Game, Pasty; Suet Crust.

SNOOKER POOL. This game is played on an ordinary billiard table. It can be played by two or more persons, either a side or independently, and is a game consisting of winning hazards, cannons being ignored.

The game is played with 22 balls which are placed on the table in the following fashion. Fifteen red ones are in the form of a triangle the ball at the apex being on the pyramid spot, and the base being parallel with, and nearest to, the top cushion. Black is on the billiard spot; pink on the centre line of the table, touching the apex ball of the pyramid; blue on the centre spot; brown on the middle of the baulk line; green on the left, and yellow on the right hand corner of the D. The remaining ball is the white or cue ball. The values of the balls are: red 1, yellow 2, green 3, brown 4, blue 5, pink 6, and black 7.

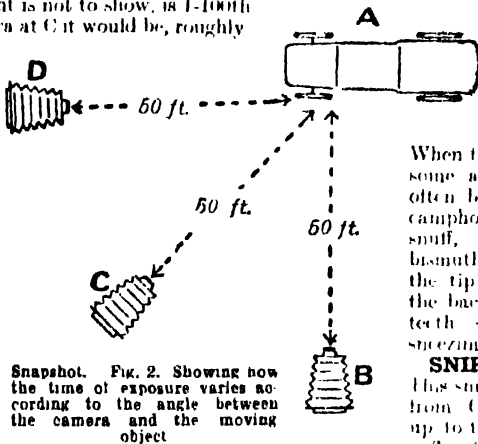
Having arranged what number of points shall make a game, the players must decide upon the order of play. The first player must play from hand with the cue ball. This must strike a red ball, and if one or more of the red balls are pocketed the player scores for each one, and continues his break until he fails to score. At his second turn he must strike one of the pool balls, these being the balls that are not red, and the game is continued by pocketing reds and pool balls alternately.

If the striker fails to score, the player next in turn plays from where the cue ball rests. If the cue ball is pocketed or forced off the table, the next player plays from hand. Each pool ball pocketed or forced off the table must be respotted before the next stroke. It should be noted that unlike the reds, two pool balls must not be pocketed by the same stroke, nor must they be struck simultaneously. See Billiards; Pool.

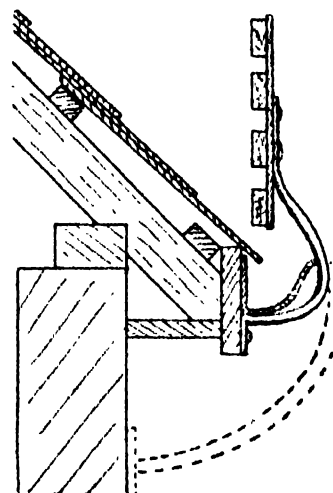
SNOORING. The usual cause of snoring is sleeping with the mouth open, particularly when lying on the back. It results from the clapping of the soft palate between two currents of air, one through the mouth and the other through the nose. The cure is to keep the mouth closed and to sleep on the right or left side; perseverance is necessary.

In some cases the mouth-breathing which provokes snoring is due to an inflamed and thickened state of the mucous membrane lining the nose, due to chronic catarrh, which must of course be dealt with. Snoring in children is a very common result of adenoids. See Adenoids; Irritating.

SNOW. A fall of snow, especially if it should be heavy or continuous, will cause considerable damage to a house unless prompt measures are taken to deal with it. These include



Snapshot. Fig. 2. Showing how the time of exposure varies according to the angle between the camera and the moving object



Snow. Section through a roof showing position of snow guard



Snowdrop. Dainty bell-shaped blossoms of one of the first spring flowering bulbs

steering it away from porch, steps, and paths; preventing it from stopping up gutters and falling on to low roofs and glass roofs. Newly fallen snow can generally be brushed away with a stiff broom, but if it has been allowed to get hard, use a spade or some form of scraper. A liberal application of salt is sometimes used to loosen hardened snow, but care must be taken to remove the whole, or a surface of icy smoothness may form instead.

Snow Guards. For the protection of low roofs or glass structures adjoining high ones, it is usual to provide a rack, or snow guard. This consists of a wooden rack or wire guard fixed at the edge of the roof. The guard supports the snow and prevents the guttering on the eaves from becoming clogged. It is necessary to provide very strong supporting brackets. The iron brackets should be at least 1½ in. by ½ in. in section, and although the single support, if placed at frequent intervals, will generally be sufficient, high roofs overhanging a greenhouse or a conservatory should be strengthened with iron brackets as indicated by dotted lines in the diagram.

The height of the snow guard need not be more than from 6 to 10 in., but the battens must be securely bolted on the brackets and the whole structure painted to preserve it. If the wooden guard is considered unsightly and wire guards are desired, they should be made from a stout gauge material and supported at more frequent intervals than in the case of wooden ones. If the wire is galvanized after it is made up it will be more durable.

Snow Ball Tree. This is another name for the guelder rose (q.v.).

SNOWBERRY BUSH. This name is given to a vigorous bush which bears attractive white berries in autumn (symphoricarpos). It thrives in ordinary soil and in shady places. The best kinds are racemose and mollis.

SNOW BLINDNESS. Long exposure of the eyes to the glaring light of snow causes inflammation of the conjunctiva. There is a gritty feeling in the eye, which begins to water, and there is difficulty in keeping the eyes open from the painful effect of light on them, more especially a bright light. The condition can be prevented by the use of smoked glasses.

SNOWDROP. This is one of the earliest spring flowering bulbs. It looks best when planted freely in grass. The bulbs should be

set 3 or 4 in. deep in August-September, they flourish in ordinary soil, particularly that of a loamy character. The common snowdrop is *Galanthus nivalis*; others with larger blooms are *Elwesii*, *byzantinus* and *pleatus*. Snowdrops may be grown in pots in the unheated greenhouse or in bowls of fibre indoors.

SNOWDROP TREE. This is a small family of hardy flowering trees belonging to the genus *Halesia*, and also known as the silver bell tree (q.v.).

SNOWFLAKE: The Flower. The snowflake is a beautiful spring and early summer-flowering bulb, with drooping, white, green-tipped flowers. It thrives in ordinary soil and should be planted in September, 3 in. deep, preferably in the rock garden. The spring snowflake, *Leucojum vernum*, is 6 in. or so high; the summer snowflake (*aestivum*) reaches a height of 18 in. One named autumnale has white flowers slightly tinged with rose in early autumn. Snowflakes do not usually bloom freely until well established.

SNOW FLY. This tiny pest, often described as the white fly, is destructive to greenhouse plants, particularly tomatoes. The fly multiplies with great rapidity, crippling foliage by sucking its sap. It disturbed the flies ascend in cloud-like swarms.

For amateurs, the best remedy is two or three fumigations with a good quinine preparation, the first to kill mature flies, and others successively about three weeks later. White-fly vapour is a proprietary preparation that is also used. See Insecticide: Spraying.

SNUFF. First said to have been used to ward off infectious diseases, snuff came into fashion as a sternutatory in the 18th century, a pinch being taken or snuffed into the nose and causing sneezing. As tobacco smoking came more and more into vogue, the practice

of snuff-taking declined. Snuff is made chiefly from the stalks and mid-ribs of the tobacco plant, ground to a fine powder and flavoured in various ways. In the process of manufacture much of the nicotine is dissipated.

Alkaline salts, including carbonate of ammonia, are added. The essential oils used for scenting include cloves, cinnamon, cassia, oil of bitter almonds, bergamot and lavender.

Snuffs are of two kinds—dry, such as dark rappee and Prince's mixture; and moist, like the popular blend known as S.P., and the Scotch, Welsh, and Irish mixtures. Kendal brown and Laundry foot and other varieties have their supporters, and most dealers supply a special mixture of their own. Some snuff-takers buy small quantities of two blends and mix them together.

Although snuff-taking is generally supposed to be harmless, it may in time cause some chronic inflammation in the nose-cavity, with thickening of the mucous membrane, and a certain amount of obstruction of the breathing. A pinch of snuff may be useful in causing the expulsion of a foreign body from the nose.

Snuff Boxes. Early snuff boxes are mostly of French workmanship, and are found either round, oval or oblong in shape. High prices have been paid for specimens of the periods of Louis XV and Louis XVI, which were of gold with carved and chased decorations, or decorated in enamel and precious stones. One of the many different designs in Napoleonic boxes is illustrated in Fig. 1. A feature of many early snuff boxes was the addition of a small spoon and grater so that the user might grind his snuff for himself.

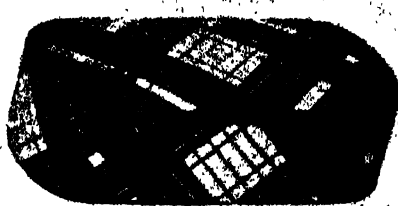
The custom of commemorating the misfortunes of the Stuarts, and of expressing loyalty to the house, was responsible for the production of many snuff boxes bearing on their lids portraits of Charles I, Charles II, and James II; but these were not necessarily made during the reigns of the monarchs portrayed.

Early in the 18th century gold, ivory, enamel and tortoiseshell were the materials used in England for presentation boxes. A charming painted box of the late 18th century is shown in Fig. 2, and illustrates the fashion for decorating the lids of snuff boxes with miniatures. As the habit of snuff taking grew copper boxes coated inside and out with white enamel were made at Battersea after the middle of the 18th century in response to popular demand.

Their shapes are often very odd, resembling boats, fiddles, books and animals. The snuff boxes decorated with plaids in imitation of the Highland tartans are frequently met with. An example of one, dating from late 18th century, is shown in Fig. 3. Boxes of papier mâché were in common use in the late 18th and early 19th



Snow Fly laying its eggs on a tomato leaf. The insect is here enlarged about five times



Snuff Box. Fig. 1. Napoleonic example with embossed medallion. Fig. 2. Georgian painted box. Fig. 3. Scottish snuff box of the Georgian period. Fig. 4. Box of chased and engraved silver; 19th century

Figs. 1-4, courtesy of Friberg & Freger

century in England. They are often decorated with mother-of-pearl or Chinese characters in gold and black, or are made to imitate tortoiseshell.

Silver boxes were fashioned in a variety of shapes and with different styles of ornamentation. The specimen illustrated in Fig. 4 shows a well known type in use through a great part of the 19th century.

SNUFFERS. A pair of snuffers consists of a pair of scissors with a closed box to hold the charred wick which is cut off. Many of them have three small feet to enable them to stand on a specially shaped tray which often accompanied the snuffers. They were made in silver, Sheffield plate, brass, and also in plated metal and iron.

Some beautiful examples of snuffers, with trays to match, the trays being pierced and chased, date from the early 18th century. Snuffers are a useful accessory in a modern home if wax candles are employed to light the dining table. See Brass.

SOAKAWAY. A soakaway is a loosely filled cavity in the earth adapted to receive rain or surface water and allow it to percolate into the ground. It is useful in many gardens and in the vicinity of houses and outbuildings. The water is first collected and delivered to the soakaway through pipes, a channel, or some similar system, which may include the ordinary form of trapped gully. It is most conveniently located immediately beneath the delivering pipe. The size of the soakaway will depend upon the quantity

of water of which it has to dispose. A convenient size is an excavation in the earth to a depth of about 6 ft., making the aperture about 3 ft. square.

In the case of good, solid earth the walls can be left in their natural state, but should preferably be cut or sided to a vertical face. The space is filled at the bottom with gravel, broken brick, clinker, or other hard core well rammed and consolidated. The whole of the cavity to a depth of about 4 ft. is filled with similar material, the top surface being covered with gravel to the level of the inlet pipe, which should normally be some 12 to 15 in. below the level of the ground. Large pieces of stone, broken brick, or similar material should be placed on the top of the gravel to allow the water to discharge freely from the pipe. The filling is continued on the top of this layer and the whole covered with soil and turf or otherwise finished.

In the case of very light soil it may be necessary to erect temporary shuttering, wooden supports, or even to line the walls with concrete. If this is done, apertures must be left to allow the water to come through, especially in the lower part of the soakaway. Such holes can easily be cast by inserting short lengths of agricultural drain pipes prior to pouring the cement between the shuttering.

Where two or more soakaways are arranged in series, to handle a larger volume of water, the first should be filled with coarse material and the others with finer materials. See Drainage.

SOAP AND ITS VARIOUS GRADES

For Household, Laundry and Toilet Purposes

Reference is suggested to the articles on Baby; Beauty Culture; Face; Hair; Shampoo; and also to the many entries that deal with cleansing processes, e.g. Laundry; Spring Cleaning; Washing Up.

The quality of soap is an important matter, whether for household or toilet use, and though ingredients vary in different soaps, according to the purpose for which they are required, they should be free from adulteration.

A good scrubbing soap for household use is light in colour and has a fresh, pleasant odour when pure fat has been used in its manufacture. Extra soda in its composition is an advantage because it cuts and extracts dirt and grease. Resin is present in yellow bar soaps, a small quantity as an ingredient produces a good lather and gives the soap a clean scent. In large quantity it is an adulterant to weight cheap soaps, and its stickiness prevents the soap from being a good cleansing agent. The darker in colour a bar soap is the lower the grade.

Wrapper soaps sold in bars of two stamped tablets are free lathering with a small proportion of resin. Disinfectant household soaps to which tar acids are added are strongly alkaline and only suitable for occasional floor scrubbing or for outhouses, etc.

It is economy to buy household bar soaps in quantity and stock them, as if thoroughly dry before use they last longer. Any scraps can be saved and put into a large earthenware jar and covered with water. As the soap jelly which forms is used, more scraps and water are added. Where there is much scrubbing to do one tablet of household soap dissolved in three quarts of water makes a satisfactory soap-suds solution.

Soap powders make a good lather. They are useful for washing down paint, and the result is good if care be taken to sponge the soap off at once with clean water. Soap powders are not economical when sold at the price of soap. They contain very little fat, which is the expensive ingredient, and a great deal of soda, which is comparatively cheap.

Laundry Soaps. Laundry soap should be firm, pale in colour and of a fine, even

texture. For rough work it should not contain much resin, and for fine work this ingredient should not be present. The so-called white soaps do not contain resin and the flaked soaps sold in packets or by the lb. are practically free from it. Resin combines with any lime in the water and in excess produces a yellow stain on the laundry when dry. Soap powders also are inclined to have this effect, and too much soda in any soap yellows white silk and fades colours.

Pure white Castile soap, which is mainly composed of olive oil, may be shredded and the lather used for washing lace and delicate fabrics. Marseilles and lower grades of white Castile have cheaper oils but are valuable cleansers for fine work.

Detergents, although synonymous with soap, now generally mean a chemical compound in liquid or powder form, and one which does not contain soap base. When used with water they have a cleansing action by loosening the tension with which dust clings.

Carpet Soap. Solid soaps specially made for cleaning carpets have the ordinary yellow soap basis, with a proportion of ox-gall, ammonia, or benzene. These extra ingredients, being detergents, assist in removing grease and also revive the colours of carpets.

The paste form of carpet soap is made by mixing fuller's earth 4 oz., spirit of turpentine 1 oz., pearl ash 8 oz. with sufficient soft soap to make a stiff paste. A liquid carpet soap is also used, which is prepared by dissolving $\frac{1}{2}$ bar of yellow soap in a pailful of hot water and, when nearly cold, adding $\frac{1}{2}$ pint of liquid ammonia.

Medicated Soaps. Medicated soaps are commonly employed for various affections of the skin. Their remedial effect is slight, however, unless they are allowed to dry on. Sulphur soap is used for scabies. Naphthol soap is used in conjunction with naphthol ointment in psoriasis. Carbolic, coal tar,

and terebene (turpentine) soaps are also used in certain cases, as, for instance, after infectious fevers, for their antiseptic effects.

Soaps are also made containing resorcin, salicylic acid, ichthylol, and many other drugs. In acute eczema, or whenever the skin is greatly inflamed, soap of any kind is exceedingly irritating, and should not be used. The skin can be cleansed by rubbing olive oil on a soft cloth and wiping it off with a dry cloth. Special soaps for washing dogs contain either sulphur or creosote.

Toilet Soaps. As only the highest grades of fat and oil should be used in a super-milled toilet soap, it cannot be bought at a cheap price. Too much caustic soda added to the fats causes the soap to be too free an alkali, which has an irritating effect on delicate skin. On the other hand, soap is cleansing to the skin by virtue of the alkali it contains. When rubbed on the skin a little of the soda separates and unites with the grease of the skin; at the same time it softens the superficial waste layers of the skin and allows of their removal by water.

It is important, therefore, that the fatty acids and alkali contained in a toilet soap should neutralize each other. Too much alkali can be detected by a simple litmus test. Having melted a small piece of soap in water and added a few drops of litmus, the colour should be mauve; if the soap be properly neutralized, if free alkali be present the colour will be blue. Super-fatted soaps may contain glycerin or an excess of fat and oil in which case they should not be stored for long as they may become rancid.

First-class toilet soaps are hard, highly polished, denoting the finest texture and of a pale colour.

English soaps of this quality are unexcelled as complexion soaps. Strong perfumes are only desirable in the best quality of soap, as essential flower oils, balsams and animal scents such as ambergris, musk and civet are costly. Synthetic perfumes and substitutes are used in the cheaper qualities. Dark colouring often disguises a poor grade of fat. The presence of too much coconut oil though a small amount is necessary to obtain a free lather, has an irritating effect on the skin and necessitates the use of a coarse perfume to disguise the strong odour.

The addition of resin in the composition of bath tablets increases their lathering quality, but these soaps should not be used for small children or for the face. Honey soap, which is yellow soap of a good quality, coloured and perfumed, and curd soaps are suitable for the bath, but are too strong in alkali for complexion soaps. Palm oil is used as an ingredient for cheaper violet soaps as it has the odour of violets.

Soaps having a good proportion of pure olive oil in their composition are the best for a baby's skin. If a child's face is shiny or rough after washing, the soap is too harsh or has been rubbed on in excess. Pure white Castile soap is usually a satisfactory choice.

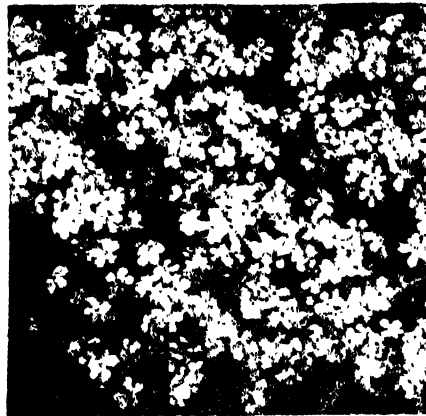
Shaving soap should lather freely with a softening effect on the beard, and no irritating effect on the skin. Caustic alkali should not be present or any excess of coconut oil, though some is necessary for free lathering. A creamy lather may be induced by paraffin wax or gum tragacanth, and a considerable amount of superfatting makes it more emollient.

SOAP BUBBLES. Soap bubbles provide children with an amusement which seldom pulls either in the nursery or out of doors. If played in the garden they are usually an even greater joy, because there is more room for the sport, and sun and foliage enhance the colouring of the bubbles. Clay pipes, with the ends well sealing-waxed, are the best implements for blowing bubbles, and the supply should be liberal, as they are very

brittle. The soapy water should be warm, and the lather is best made with soap flakes or soft soap.

The pipe should be put into the water with the bowl downwards. If it is shaken gently up and down once or twice in this position enough of the water will have been collected to form a good bubble without a lot of unnecessary fluid. Each player will have his own methods and fancies; one may set out to blow very large bubbles without releasing them and letting them float in the air; another may like to blow many small ones and allow them to form a fleet.

SOAPWORT. This group of hardy annual and perennial plants bears rose-coloured flowers in summer. Of the perennials *Saponaria ocyroides* is a charming trailing plant for the rock garden; another good rock garden plant is *caespitosa*. Both flourish in well-drained rocky soil. A taller kind, which grows from 18 to 20 in. high, and has double rose-coloured blooms in summer, is an attractive border plant. The best of



soapwort. Profusion of pink blossoms of the small species *boissieri*, a useful rock garden plant

the annuals is *calabrica*, 6 in., with rose-coloured blooms, which is raised from seeds sown out of doors in spring.

SOCKS FOR ADULTS AND CHILDREN

Instructions for Knitting Standard Patterns

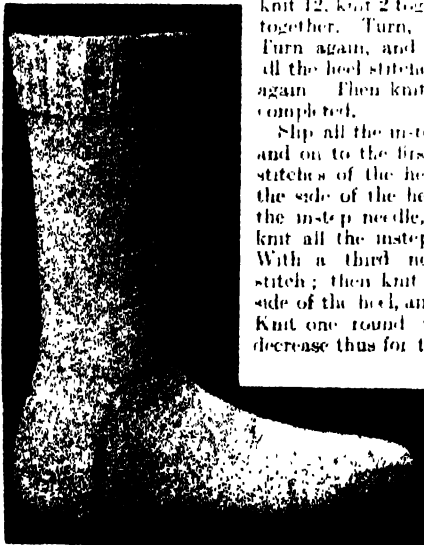
This article gives detailed instructions for knitting a pair of woolen socks for a man, a pair of woolen socks for a child, and a pair of bed socks. Other articles on knit wear include Bootees, Gaiters, Stockings. See also Darning, Knitting, Venting, Wool.

With a heavy type of shoes or boots in cold weather, machine or hand-knitted ribbed woolen socks for men and boys are most suitable. A heavy shoe will quickly wear holes in a thin sock. For evening dress plain black silk, and for ordinary town wear, with shoes of medium weight, cashmere socks are worn by most men. These last should be guaranteed pure wool and of a firm but soft and even texture.

When buying woolen socks, whether woven or knitted, it is well to purchase a size too large. Even though guaranteed unshrinkable, however carefully washed they will shrink a little. Measuring round the closed fist to ascertain the length of a sock is not infallible. It is better to ask for socks that will fit a size larger than the shoes worn.

For country wear, well-knitted socks are the most comfortable for much exercise. Heels and toes may be strengthened by double wool or by knitting silk of the same shade. Knitting should be loose enough for the needles to pass through easily, and success depends on an even appearance and upon the skill in turning the heel and rounding the toe.

Babies' socks are usually made in the softest white-wool, and may be knitted in a fancy stitch, or, if preferred, crocheted in a rib-stitch. This is ordinary double crochet, the ribbed effect being obtained by putting the hook into the back part of the foundation each time a stitch is worked, instead of into the front. For children, but socks are knitted in silk. Mercerized or fine crochet cotton may be used and also fine wool. Boys' socks are usually of a heavier make.



Socks. Fig. 1. Man's sock in soft wool that can be knitted at home

Men's Knitted Socks. A pair of men's woolen socks is illustrated in Fig. 1. They are of average size, and since the leg is not shaped, they can be made either longer or shorter without necessitating a change of pattern. The knitting is done at a tension to produce about 10 stitches to the inch in width; 4 oz. of 4 ply Bealve Soft Knitting wool and 4 No. 13 knitting needles are required to make a pair.

Begin by casting on 84 stitches, 28 on each of 3 needles, and work in rounds, in ribs of knit 2 and purl 2 until 4 in. have been worked.

Continue in plain knitting until the sock measures 11 in., and then commence the heel as follows: Knit the first 21 stitches of the round on to one needle, and slip the last 21 stitches of the round on to the other end of the same needle. These 12 stitches are for the heel, and all the others, which make up the instep, should be divided on to two needles.

On the heel stitches purl and knit a row alternately until 41 more rows are worked. The first stitch of each row should be slipped, and the last row should be a purl one. To turn the heel, knit 26, knit 2 together, then turn, purl 11 and purl 2 together. Turn, knit 12, knit 2 together. Turn, purl 13, purl 2 together. Turn, knit 14, knit 2 together. Turn again, and continue in this way until all the heel stitches are worked on to one row again. Then knit 13 stitches and the heel is completed.

Slip all the instep stitches on to one needle, and on to the first needle knit the remaining stitches of the heel. Knit up 21 stitches at the side of the heel and the first stitch from the instep needle, and with a second needle knit all the instep stitches but the last one. With a third needle knit the last instep stitch; then knit up 21 stitches at the other side of the heel, and the other 13 heel stitches. Knit one round without shaping, and then decrease thus for the instep in the next round.

Knit to the last four stitches of the first needle, knit 2 together, knit 2. Knit the stitches on the second needle without shaping, but on the third, knit 2, knit 2 together, and through the back of the loops knit to the end of the needles. Repeat

the last 2 rounds until only 20 stitches remain on each of the first and third needles. If a 10 in. foot is required, work without shaping until the sock measures $6\frac{1}{2}$ in. from the side of the heel where the stitches were knitted up; for a 10½ in. foot, work 7 in. from the side of the heel, and $7\frac{1}{2}$ in. for a foot measuring 11 in.

Shape the toe thus: * Knit to the last three stitches on the first needle, then knit 2 together and knit 1. On the second needle, knit 1, knit 2 together, and then knit to the last 3 stitches; then knit 2 together, and knit 1. On the third needle, knit 1, knit 2 together through the back of the loops, and knit to the end of the row. Knit 1 round without shaping, and then repeat from * until only 24 stitches remain on the round. Knit the stitches on the first needle on to the third, and close the toe, by the procedure known as grafting.

To do this, place the two needles together and having threaded the wool into the bodkin, work in the following way. Place the bodkin in the first stitch of the front row, as for knitting, slip the stitch off the needle, and draw the wool through. Then put the bodkin in the second stitch of the front needle as for purling, and draw the wool through, but do not slip the stitch off the needle. Pass the bodkin under the front needle, put it in the first stitch of the back row, as for purling, draw the wool through and slip the stitch off the needle. Then place the bodkin in the second stitch of the back row, this time as for knitting, and draw the wool through, but do not slip the stitch off the needle. By this it will be seen that the action of the bodkin is reversed on the back needle. Repeat until all the stitches are worked off, and take care not to draw up the wool too tightly. When the last stitch is reached, pass the wool through it and fasten it off securely on the wrong side.

Child's Socks. Woolen socks, with striped coloured tops, Fig. 2, for a child of about 6 years of age, can be made according to the following directions. The socks measure 8½ in. from the top to the ankle and 17 in. from the back of the heel to the point of the toe, and the work is done at a tension to produce about 10 stitches to the inch in width. The materials required are 1½ oz. of Bealve 3-ply Scotch heathering wool in white or grey, and ½ oz. of the same kind of wool in any other colour for the turnover or striped tops, with four No. 11 steel knitting needles.

With the coloured wool cast 24 stitches on each of 3 needles, and working the top in a rib of knit 1 and purl 1, do 4 rounds in the coloured wool and 4 rounds in white, then 1 round in colour, 4 rounds in white, 4 rounds in colour, 4 rounds in white. This completes the top, and as both sides are the same it does not require turning if the socks are to be worn with a turnover top.

Knit the next round in plain knitting and increase one stitch at the beginning of the round by picking up a loop of the previous round and knitting it as an ordinary stitch. Now begin the shaping for the leg in the next round. * Knit 1 stitch, knit 2 together, knit to the last 3 stitches of the round, slip 1, knit 1, pass the slipped stitch over the knitted, knit 1. Knit 4 rounds without any shaping. Repeat from * 3 more times, then do another decrease round, making 5 decrease rounds and 10 stitches decreased away all together. Work 51 more rounds to reach the ankle. Extra rounds are worked here for longer sock.

Now begin the heel. Knit the first 16 stitches of the round on to one needle, slip the last 16 stitches of the same round on the other end of the same needle, these 32 stitches are for the heel flap. Divide the remaining 31 stitches on 2 needles and leave them for the instep. Now work on the heel stitches, always slipping the first stitch, knit 32, turn, knit 31, turn, purl 30, turn, knit 29, turn. Continue

in this manner until 9 stitches are left at each side of the heel, the last now being purl 14.

Turn and knit 14, lift up the right-hand side of the loop just before the 15th stitch and knit the 2 stitches together to prevent a hole.

Turn, purl 16 lift up the loop just before the 16th stitch and purl the 2 together. Continue in this manner working one extra stitch on to each row till all the 32 stitches are on the one row. The last row will be a purl row. Knit back 16 stitches and so complete the heel. Slip the instep stitches on to one needle.

Now on the first



Socks Fig. 2. Child's sock hand-knitted in wool, with coloured turnover top

needle knit the remaining 16 stitches of the heel, knit up 2 stitches at the side of the heel, and knit the first stitch from off the instep needle. With the second needle knit the instep stitches, with the third needle knit up 3 stitches from the side of the heel and the other 16 stitches. Knit one round plain, then decrease for the instep in the next round as follows. Knit to the last 3 stitches of the first needle, then knit 2 together, knit 1, knit the second needle without any shaping, on the third needle knit 1, slip 1, knit 1, pass the slipped stitch over the knitted one, then knit to the end of the needle. Repeat the last 2 rounds 3 times. Now work 56 rounds without any shaping for the length of foot required before shaping the toe, allowing for the latter to add another 17 in.

Shape the toe as follows: * Knit to the last 3 stitches of the first needle, knit 2 together, knit 1; on the second needle knit 1, slip 1, knit 1, pass the slipped stitch over the knitted, knit to the last 3 stitches of the same needle, then knit 2 together, knit 1; on the third needle knit 1, slip 1, knit 1, pass the slipped stitch over the knitted one, knit to the end of the needle. Knit 2 rounds without shaping. Repeat from * until there are only 28 stitches in the round, then knit the stitches of the first needle on to the third needle.

Place the two needles together, and knit a stitch from each needle at a time, and when 2 stitches are on the right-hand needle slip the first one over the second stitch, and so on

until there is only one stitch left, then cut the wool, draw it through the last stitch, thread the end in a darning needle, and fasten off very securely on the wrong side of the sock. Casting off the toe can also be done by grafting which is a much neater method and more comfortable in wear (see page 659).

Bed Socks. To make a pair of bed socks of average size for a woman 2½ oz. of some such soft wool as Baldwin & Walker's 3 ply Ladyship Flossella Wool will be required and also 1½ yards of ribbon, and three No. 7 needles. Commence at the top by casting on 53 stitches, and work the first 24 rows in ribs of 2 plain and 2 purl, always knitting the first two stitches at the commencement of every row and purling the last three stitches of every row.

Now change and work in moss-stitch (1 stitch plain and the next stitch purl, alternately to the end of the row, then on the return row reverse the order of the stitches so that a plain stitch comes over a purl stitch of last row) for 4 inches, increasing 1 stitch at the beginning of the first row in order to bring the stitches up to 51.

To make the holes for the ribbon, work 2 moss-stitches, * make 1, take 2 tog., 1 moss stitch, repeat from * to the end of the work, ending with 2 moss stitches. Now work again in moss stitch for 12 rows, then the stitches will be divided for the foot.

Work in moss-stitch over the first 16 stitches, on the next 22 stitches work backwards and forwards in moss-stitch for 40 rows (always slipping the first stitch), then break off the wool and join to where the 16 stitches were left and with the same needle pick up 20 stitches along the side of the instep flap and also 11 stitches across the toe. With the spare needle work across the remaining 11 toe stitches and pick up 20 stitches along the other side of the instep flap, also the 16 remaining stitches on to the same needle. Work across all the stitches for 10 rows, then decrease 1 stitch at both ends of both needles for 5 rows. Then cast off or leave the stitches for grafting. Join up the seams and thread the holes at the ankle with the ribbon.

SODA. Soda is a valuable agent for quickly and thoroughly removing grease and dirt from pots, pans, and other kitchen utensils, accessories, and cloths. These should be thoroughly rinsed in clear hot water before they are dried. Soda should not be used for cleaning aluminum and enamelled vessels.

Household Uses. If the household water is very hard, common soda is frequently added to it when boiling green vegetables, or it is used for the purpose of restoring the colour of the vegetables when they have been closely packed and carried to market. It is, however, preferable to sacrifice appearance and omit it altogether, for on some constitutions it has a deleterious effect, particularly the common or washing soda. At all times the quantity should be strictly noted, and bicarbonate of soda should be substituted for the washing soda, as much as will be on a sixpence being quite sufficient to soften each gallon of water.

Bicarbonate of soda is used as a raising agent in the making of bread, cakes, and scones, and for cakes it has almost superseded yeast. Sometimes cream of tartar is added to the soda in order to prevent it from darkening the flour. Bicarbonate of soda is the most important ingredient of baking powder.

Uses in Medicine. Soda is largely employed for medical purposes in the form of various salts of sodium.

Sodium bicarbonate, 2 drams to the pint of water, is a useful lotion to apply to the skin in cases of mild itching. Made into a paste with a little water and applied to insect bites and stings, it often gives immediate relief, as also in burns and scalds before blisters have formed.

Internally sodium bicarbonate is constantly prescribed in various kinds of indigestion.

The phosphate and sulphate of soda and tartarated soda are widely used purgative salts. Most of the natural purgative mineral waters such as Apenta, Rubinat, Hunyadi Janos, Carlbad, etc., derive their characteristic action from one or more of these sodium salts.

Sodium chloride or common salt is one of the natural ingredients of the tissues, and therefore is an essential article of our dietary. In large doses it acts as a cathartic.

Sodium citrate is often added to the milk of babies' bottles to make it more readily digestible. One gram of sodium citrate dissolved in a teaspoonful of water is added for each ounce of cow's milk in the bottle. The effect is to render the curd of the milk which forms in the infant's stomach less tough. See Salt.

SODA CAKE. For making this delicious cake, the ingredients are 1 lb. flour, ½ lb. sultanas, ½ lb. chopped peel, 6 oz. meringue, ½ lb. granulated sugar, a little grated nutmeg, 2 eggs, 1 teaspoonful bicarbonate of soda, 1½ gills milk, and a pinch of salt. Sift flour and salt together, rub in the meringue, add the sugar and dried fruit. Put the bicarbonate of soda in the milk and add it to the eggs, which have been beaten. Pour this on to the dry ingredients, and beat all thoroughly before putting the mixture into a baking tin lined with paper and baking it in a moderate oven for about 2½ hours.

SODA WATER. The name soda water is rather misleading, for commercial soda water consists usually of water charged with carbonic acid gas. Occasionally soda is present in small quantities, about 5 gr. of bicarbonate of soda to the bottle. It should properly contain 10 gr. to the pint of aerated water. Soda water can be made at home, the aerating process being accomplished with sparklets. See Sparklet.

SOFA. Through its predecessors the day bed, counting seat, settee, and the couch of the Regency period, the sofa has a very long pedigree. As seen to-day it has a head at one end and sometimes a back. The frame is of wood, which may be mahogany, deal,

intermediate value. Many sofas are fitted with a loose cushion and a bolster for the head.

In Victorian days a sofa was made and sold as part of a suite of furniture, and these suites were seen in dining rooms, drawing rooms, and other living-rooms. To-day the sofa is less popular, its place having been taken to a large extent by the divan, modern versions of the settee, or the Chesterfield.

It may be remembered that, in common with many other pieces dating from the first half of the 19th century, well-made sofas increase in value and interest as people begin to collect furniture of this period.

Repairing a Sofa. The back of a sofa is composed of a shaped top rail as at A, Fig. 1, two ends B, a centre piece C, and a bottom rail D. These parts are generally secured together with dowels, as shown, and if loose they can be replaced and the joint glued up again. An alternative method of strengthening the frame is to screw on angle brackets at the corners as at E. This method should not be employed in the case of a badly damaged frame.

The frame itself is usually dovetailed to the seat frame and screwed to the scroll ends. The seat frame shown at Fig. 2 is sufficiently strong to resist the strain of wear, but it is possible that the cross or end rails may have become loose or broken; in this case the method of repair is to fit a new rail across, as at F or G, the latter being additional, to strengthen the frame or remove a twist caused by a warped length.

The legs are usually secured with dowels, the repairing being generally a matter of fitting new dowels. It will be seen from Fig. 3, which

shows a plan of the framing directly over one of the legs, that two of the dowels are fitted in the outer rail and one in the cross rail. In renewing them, a larger diameter dowel should be provided, and the old ones bored out. In addition the two flat surfaces should be scraped quite clean so that the glue will hold up tight. The leg with dowels is shown in Fig. 4.

Castors may have been replaced two or three times and worked loose again, or the wood may have split. In the former case it is advisable to fit a stout dowel in the leg as in Fig. 5, the end can be shaped so as to fit in the castor. If the leg has been split at the bottom, it will be as well to bind it with wire, suitable grooves being cut as in Fig. 6. By using an ordinary wood filler the wire binding can be entirely covered and will not be noticed. The scroll ends are liable to work loose or break off at the tenon joints, as at H, Fig. 2, and K in Fig. 7. Although they can be glued up again, it is generally more satisfactory to cut the tenons off, fill up the mortises with suitable blocks of wood, and replace with a dowelled joint, as in Fig. 8. The dowels should enter both pieces for at least 14 in.

If the ends are not very loose, the joint can be strengthened by blocks of wood screwed to the inside of the frame, as at L, Fig. 9, but it will probably be necessary to fit in thin blocks each side, as at M, to bring the inside of the scroll upright to the same distance as the seat rail. Further strengthening may be necessary in dealing with the scroll ends by renewing the rails P, R, and T. These are placed there as much for upholstery purposes as for strengthening the construction. As a rule, they are secured by glued blocks, as at N, but in better class work they are housed in the sides.

Breakages in the short grain of the wood are not unusual, either at the bottom, as at W, Fig. 7, or as in Fig. 10. In dealing with a break as at W, the best way is to screw on a suitable strip of hardwood, as shown. Breakages at the top are repaired with a narrow strip screwed on as in Fig. 10, but the broken edges, particularly if they are of long standing, must be thoroughly cleaned and glued together. Re-glued joints should have newly planed surfaces, but if this is impracticable, the surfaces must be scraped to remove old glue, where it is impossible to use a scraper, the wood should be cleaned with hot water and a

stiff brush. See Castor; Chesterfield; Divan; Dowelling; Settee.

SOFFIT: In Building. There are numerous applications of the soffit in domestic architecture. Externally it is the covering applied to the underside of the eaves of a house on internal parts of the building the term soffit refers to exposed ceilings such as those found beneath some forms of staircase.

The term is applied to the inner face of an arch and to some forms of ceiling formed into panels and otherwise treated, and often found on projecting or bow windows. Soffit lining is the covering on the underside of lintels for a window or door, or arch opening, or the linings covering the underside of an exposed flight of stairs. See Ceiling; Eaves; Rafter; Roof.

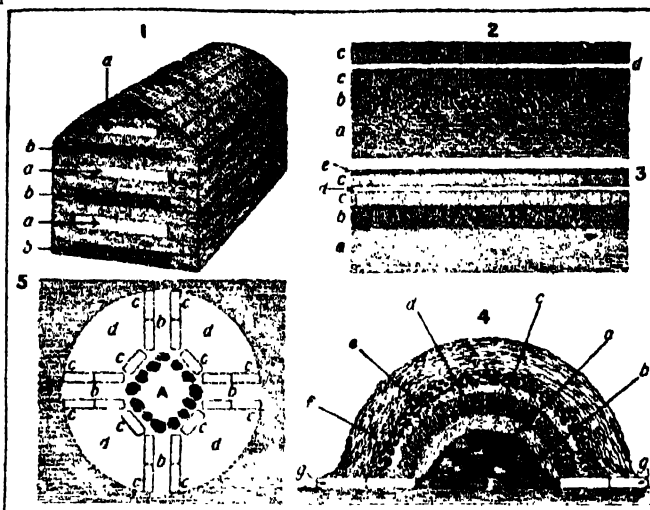
Soft Water. See Water Supply.

SOFTWOOD. The timbers that are classed as softwoods are those that are light in texture and are easily worked, the opposite kinds being the hardwoods. The chief of the softwoods are the coniferous trees such as the pine, fir, larch, and yew. They abound in resin, and yield turpentine and pitch. See Hardwood; Larch; Pine; Wood.

SOIL: The Varieties. The chief kinds of garden soil are heavy, loamy, peaty and light or sandy soil. The nature of each can be modified by artificial treatment to suit the conditions of the garden and the requirements of the plants that are to be grown therein.

Of the four chief kinds of soil, a heavy soil consists almost entirely of stiff clay, and must be lightened by deep digging and throwing

the subsoil open to disintegration by the action of frost during the winter months. It may also be further lightened by the admixture of sand, wood ashes, burnt weeds, grass and other bonfire material. Road sweepings, where they can be obtained free from the taint



Soil. 1. Soil stack: curves interlaid with lime (a) and manure (b). 2. Lightening heavy soil: a, bottom spit well dug; b, manure; c, top soil with lime and sand forked in (d). 3. Improving light soil: a, subsoil; b, manure; pig, cow or vegetable refuse; c, top spit with lime (d); e, surface of clay or heavy loam. 4. How to burn clay: a, coal and coke fire; b, soil; c, soil and slack; d, coal dust; e, leaves; f, soil; g, draught bricks. b. Base for same: A, fire; b, draught passages; c, bricks; d, soil, etc.

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of petrol refuse, are excellent for lightening heavy soils.

A loamy soil is the best for all general purposes, and is the one in which clay and sand are found naturally mixed. A peat soil is very dark in colour, due to the preponderance of decayed leaves in its composition. It is invariably found in the neighbourhood of woods and forests, and should be mixed with other soils to obtain the best results.

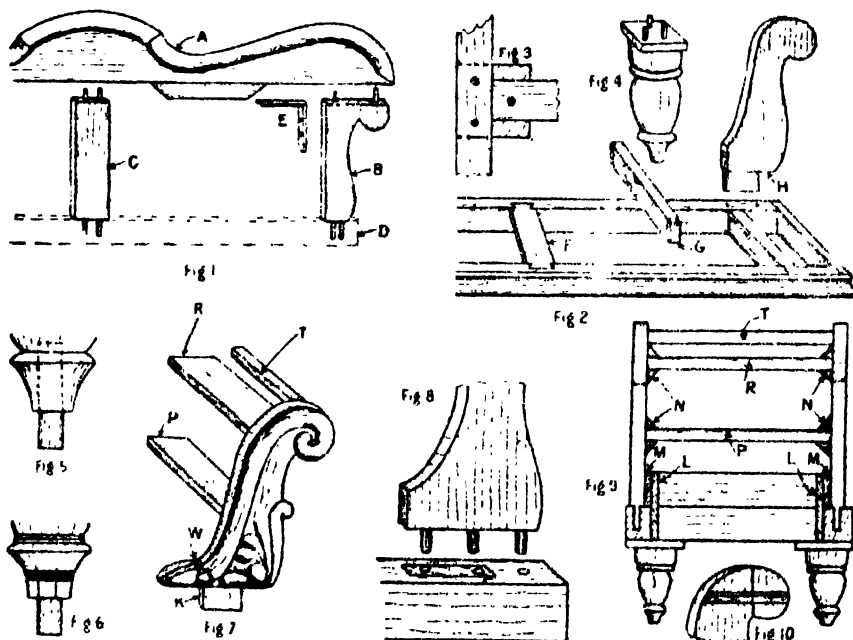
Sandy soil is easily recognized by its dry and powdery nature. It is composed chiefly of silica, and alone is unsatisfactory and unproductive. It is best improved by the addition of clay, animal manure, decayed vegetation, and anything that helps to bind the particles of sand together.

If the soil is sick, and grows moss and sorrel, it contains too much acid, and requires a good dressing of lime. In making a new garden liming is always necessary. About 10 lb. to a square rod will be sufficient.

Health and the Soil. The nature of the soil on which a house is built may have a great deal of influence on the health of the inhabitants. It often happens that a person who suffers from rheumatism, neuralgia, lung troubles, etc., finds himself much better on changing his residence to another neighbourhood. There may be other reasons, of course, for the improvement, but in many cases the chief cause is removal from a damp soil or low location to porous, dry, and warm ground.

The most porous or permeable soils are gravel and sand. Through these the rainfall percolates freely, passing down until it meets an impermeable stratum, such as clay or rock. The next most porous is a chalk soil. Any of these furnishes a dry site for a house provided it is situated on a slope. Limestone is only slightly porous, the water will flow away over it if the site is on a slope, but otherwise it is apt to keep the surface wet.

Hard rocks and clay soil are almost impervious to water. A rock site on a slope forms a very healthy foundation as the water flows away quickly. Clay is nearly always cold, and on a dead level, or in a hollow, it forms a



Sofa: how to repair. Fig. 1. Pieces forming back framework. Fig. 2. Seat frame with new cross rails. Fig. 3. Plan of framing above leg. Fig. 4. New dowels fitted in leg. Fig. 5. Worn leg repaired for fitting new castor. Fig. 6. Split leg bound with wire. Fig. 7. Scroll end of sofa. Fig. 8. Mending broken joint of scroll end. Fig. 9. Details of end. Fig. 10. Repairing top of scroll.

very wet, bad site, both the ground and the air being damp. When sandstone or chalk is present in a mixture with clay, it is likely to be damp unless the slope is steep enough to allow the water to run away freely.

Two important points have to be considered in connexion with soil, namely, ground water and ground air. All soils except those that are quite impervious, contain water and air. The water consists of the rain which has passed through the upper porous layers, and at a greater or less depth, is prevented from sinking further by an underlying impervious stratum. Thus if we dig down we always reach water. In some low-lying, wet places this ground or subsoil water comes up close to the surface in rainy seasons; in marshy districts it may be level with the surface; in other places it may be hundreds of feet down.

Above the level of the ground water the interstices of the soil are filled with air, the ground air. When the water level is close to the surface a great deal of it goes off into the outer air by evaporation, making the air around the house damp. The level is constantly varying, and each time the ground water rises it forces out the air contained in the soil above it.

If the soil is pure this air is harmless. If the soil is contaminated, the air will be impure, and when forced into the basement of a house it may cause injury to health. The soil may be contaminated by its contents of decaying vegetable matter, or by drainage from manure heaps, cesspools, middens, farm buildings, leaking drains, lavatories, etc. Not only does a rise of ground water force gas into a house, unless there is a thick concrete foundation, but it may contaminate wells.

The points to consider in connexion with this matter are the nearness to the surface of the ground water and the greater or less fluctuations of level which take place. If the ground water is not more than ten feet below the surface, the site is not a good one for a dwelling house; probably the level should be fifteen or twenty feet. Likewise, if there are great and frequent changes in the level of the water, danger arises from the gases forced out.

In Great Britain the building by-laws of most local authorities now require the provision of a ground layer. This usually consists of six inches of concrete over the site of the rooms, and effectually prevents any movement of ground air inside the house irrespective of the level of the ground water. It also protects the inmates of the house from contaminated ground air which is detrimental to their health. See House Ventilation.

SOIL PIPE. This name is given to an impervious pipe connecting the w.c. with the manhole in a drainage system. The requirements of the local authorities must be strictly observed when putting in, repairing, or in any way dealing with soil pipes.

In most districts it is a requirement that these pipes be of good grade cast iron treated on the interior with Dr. Angus Smith's solution to render them immune from the attack of acids, water, and foul matter generally. All joints must be properly made and absolutely airtight. Customarily an air vent is provided from the highest point reached by the soil pipe and taken from that some distance above the roof.

The lower end of the soil pipe discharges into the first manhole adjacent to the house. This manhole has also to be ventilated with fresh air in common with other parts of the sewage system. The result in a properly devised system is that the soil pipe is normally empty and is ventilated throughout by a steady current of air. The exterior of the pipe should be kept in good condition by the frequent application of paint, and all ears, lugs, straps, etc., used to fix the pipe to the

exterior of the building should be examined from time to time. See Drains; Sanitation.

SOLANUM. This is the botanical name of a group of shrubs and plants which includes the potato and several kinds of ornamental value. The bitter sweet of the hedge-rows, of which the red berries are poisonous, is *Solanum dulcamara*. *Solanum melongena* is the egg fruit or aubergine which is raised from seed under glass in spring and grown in large flower pots or on a sunny border. The winter cherry (*Solanum capicastrum*) is a favourite window and greenhouse plant which bears orange-red fruits in winter and is raised from seeds or cuttings under glass in spring. *Solanum crispum*, mauve, and *jasminoides*, white, are vigorous climbing plants suitable for a wall in mild districts, or for the greenhouse elsewhere. *Solanum Wendlandi*, which must be grown under glass is a climbing plant with large mauve blooms.

SOLAR FLOWER. A flower that opens and shuts during the day about certain hours is known as a solar flower. Thus the goats-beard is open from 3 to 5, the dandelion from 5 to 6, the pimpernel about 8; day lily from 10 to 11, and the tiger lily about 12.



Solanum. The winter cherry (*Solanum capicastrum*), a greenhouse and window plant with orange-red berries in winter.

Closing times vary with particular plants. Solar flowers are sometimes used to compose a floral clock.

SOLAR PLEXUS. Lying behind the stomach and in front of the aorta, or chief blood vessel of the abdomen, is that part of the sympathetic nervous system known as the solar plexus. It consists of two large ganglia, and of interlacing nerve fibres. It receives branches from the right vagus nerve and supplies branches to the liver, stomach and other abdominal organs. The disabling effects of a blow over the solar plexus are well known.

SOLDERING FOR THE METAL WORKER

Enabling the Handyman to Undertake his own Repairs

THE following is a copy for a number of readers of a short article on soldering, written by C. H. W. P. and published in the "Handyman" for April 1914. It is a very short article, but it is a very good one. See the new Pipe, etc., in the "Handyman".

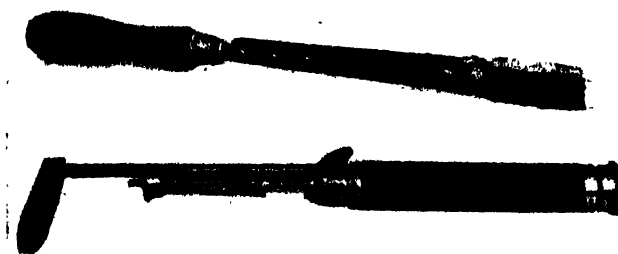
The process of joining metals together by means of another metal that melts at a relatively low temperature is known as soldering.

The requirements for amateur work consist of a soldering iron or copper bit (Fig. 1), some solder, flux, emery paper, an old file or two and an old knife for scraping the metal clean. In addition there must be some means for heating the iron, and preferably some sacking or rough cloth with which to wipe it clean.

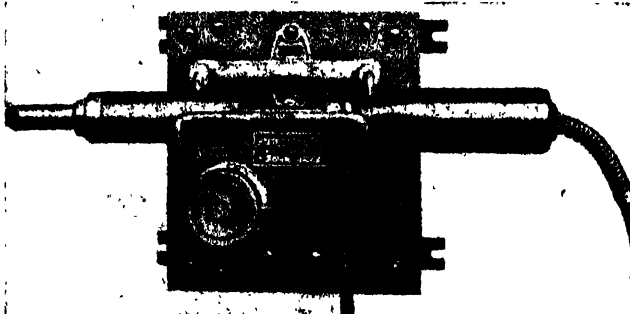
1 in. wide and 4 in. thick, sold by weight. Blow pipe solder, which is harder, is sold in long, thin strips; this is best used with a large copper bit or a blow pipe. Tinman's solder also can be purchased in narrow strips.

The soldering acid or flux may be powdered resin, killed spirits, that is, hydrochloric acid in which a number of small pieces of zinc plate have been dissolved, or one of the proprietary brands. A combined solder and flux in paste form is useful for small jobs, as the surfaces can be coated with the paste, held or wired together, and united by sweating, using a blow pipe or lamp, as later described. In an awkward corner the point of the soldering iron can be introduced to heat the joint.

The heating medium for the soldering iron



The size of the iron and its type will depend on the nature of the work. For domestic use a plain bit weighing about 3/4 to 1 lb. will suffice, and this may be the ordinary adjustable type of iron with a wooden handle. The term "iron" is misleading, for the actual heating element is a pointed or hatchet-shaped piece of copper. The most useful form of solder is tinman's solder in bars about



Soldering. Fig. 1. Top, ordinary type of soldering iron, showing well-tinned bit. Centre, self-heating petrol blow lamp type of soldering iron. Bottom, electrically heated soldering iron in place on economy bracket; the weight of the iron automatically presses down the bracket and reduces the current consumed.

is preferably a gas heater of some kind, a regular soldering stove, or a powerful blow-lamp when gas heating is not available. Irons are made that are self-heating (Fig. 1). Some derive their heat from a self-contained gas burner, and others from an electric heating device, or a petrol blow lamp forming a part of the soldering iron itself.

Mending a Kettle. As an example of the methods of soft soldering, suppose a leak is to be mended in a tin kettle. The first step is to clean the surface to be repaired. The best method is to scrape or polish the metal with an old file or knife, as in Fig. 2, and finish with rough emery paper. Then wipe the metal clean with a piece of clean cloth to remove the dust and chips.

The iron is heated over a gas ring or any clear, hot, bright fire until the copper is almost but not quite red hot. Now take the bit from the fire and wipe it quickly with a cloth to remove any surface dust. Next rub the tip of the copper with a file, as in Fig. 3, testing the iron on an odd bit of wood or metal to prevent scorching the bench.

The next step is to tin the bit, that is, to cause a film of solder to run on to and adhere to the point of the bit. If the bit has cooled in the cleaning process it must be reheated. Place a spot of flux on the centre of the clean piece of tinplate and dip the point of the hot iron into the flux for a moment. Then, holding the iron in the right hand and the strip of solder in the left, place the point of the iron on the tinplate and apply the solder to the edge of the iron.

The worker turns the iron over as the solder melts (Fig. 4), moving it about and rubbing it into the little pool of molten metal until the solder adheres to all the four sides near the point of the iron. The appearance of a well-

timed bit is shown in Fig. 5, and it is in this state that the iron is fit to use. The iron need not be reheated until it fails to melt the solder freely. When this point is reached, take care not to overheat the iron and melt off the tinning, as if this is done it will have to be cleaned and retinned as already described. If carefully used the iron should not need tinning except at long intervals.

Presuming the iron to be still hot, the next step is to take a small disk of tinplate and place it over the hole on the cleaned part of the work in hand, to which flux will previously have been applied, adding a touch of flux to the edges. Press the iron on the edges of the tinplate disk and apply the solder to the side of the soldering bit, melting off a few lumps or blobs as shown in Fig. 6 and proceed to flow the solder all round the edges of the disk. At the same time press the soldering iron on the centre of the disk to assist in heating it, and also to draw the solder well under the metal and ensure a sound joint. Finish by running the iron around the joint to make the surface of the solder neat and tidy, as shown in Fig. 7.

It is well when the solder has been run round the patch, to press on the latter with the point of an old file or some similar object, so as to hold the patch firm until the solder cools. If the file is held upright on the centre of the patch the soldering iron can be worked round the edges of the patch to make a neat and even joint. The kettle should be firmly supported so that both hands are free.

Exactly the same processes are followed in soldering any tinplate article, the steps being to clean the surfaces, apply flux, see that the iron is well tinned and sufficiently hot, flow the solder round and under the joint, and finish by smoothing with the point of the iron. Any small lumps of solder are removed by the iron

or can be filed away, the use of the soldering iron being preferable.

Tinning a Joint. For brass or copper the same procedure is adopted, except that it is necessary first to tin the surfaces to be united. This is accomplished by rubbing with the point of the tinned copper soldering bit and at the same time flowing on a further supply of solder. The surface is generally made smooth and bright by wiping it over with a clean rag while the solder is still hot and molten. This ensures a better ultimate joint, as the two faces can then be brought into more intimate contact.

Wrought iron and steel can be soft soldered by first tinning the surfaces; they are, however, more often brazed together, as there are few occasions for the use of soft solder when steel has to be employed, since this metal is used on the grounds of strength. A soft soldered joint is not naturally strong unless the parts to be joined are fitted into one another, or otherwise made secure against external stresses.

Sweated Joints. Another method of soft soldering is known as sweating, and this does not call for the use of a soldering iron. The typical procedure can be illustrated by the case of a brass ferrule forming part of a pipe union for attachment to a gas fitting. The first steps in this case are to clean the surfaces thoroughly and then to tin them by holding the parts in the flame of a blow lamp; as soon as the metal is hot, apply a trace of flux and press the end of the stick of solder on to the metal. It should then flow over the surface and partly adhere. The tinning is completed by wiping the surface with a clean rag.

The parts are then placed in position, the flame of the blow lamp directed on to the joint, and the solder melted into place. The end of the joint should be pressed against some suitable object, the heat being concentrated on the outer part of the joint, remote from the lip, as the solder will always run towards the heat. If the greatest heat is at the inner end where the joint begins, the solder will be more difficult to flow into place. Small jobs can be carried out by using paste solder combined with flux. Sometimes the objects to be united can be held over the flame of a gas-ring, spirit lamp, or Bunsen burner.

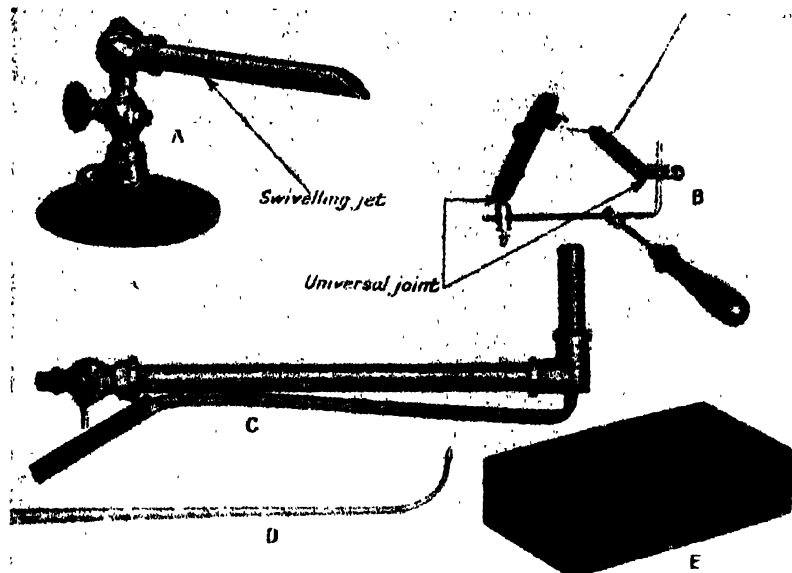
Zinc is soldered in the usual way, but with the use of killed spirit as a flux. Aluminum can be soldered, but only with specially prepared solders and a suitable flux. There are several proprietary brands on the market, and they should be employed exactly as the makers direct. Methods of soldering lead are dealt with in this Encyclopedia under the heading of plumbing.

Hard Soldering. To carry out hard soldering, or silver soldering, a blow lamp or blow pipe (Fig. 8) is essential, or some other form of easily controllable heat giving a long clean blue flame. The soldering is effected with silver, the metal being alloyed with a small proportion of brass, to lower the melting point. Articles made of silver can thus be united with the solder without danger of fusing them. This method is used by silversmiths and jewellers, and has the advantage that the joints are particularly strong and durable for small work, being in many respects superior to brazing. There are several kinds of flux that may be used, but probably the best is borax in lump form, which is reduced to a paste with water by rubbing the borax on the surface of a slate. The solder is obtainable in several grades, melting at different temperatures. To use it, the metal is cut into strips of suitable size and fed up to the job while playing on it with the blow-pipe flame or the jet of a blow lamp.

As an example, suppose it is desired to solder in a boiler end to a model boiler, the barrel being formed of seamless tube, as



Soldering. Fig. 2. Scraping bottom of kettle with a file before soldering. Fig. 3. Cleaning end of iron before tinning it. Fig. 4. Tinning the bit by dipping it into molten solder. Fig. 5. Well tinned bit. Fig. 6. Soldering disk over a hole in a tin kettle. Fig. 7. Patch soldered in place on kettle.



Soldering. Fig. 8. Implements used in hard soldering. A, bench gas burner. B, holder for small objects. C, gas blow pipe. D, mouth blow pipe. E, charcoal block.

Courtesy of H. W. Burn & Co.

described in the article on Engine. After the surfaces of barrel end and disk have been cleaned the borax paste is applied to the joint with the point of a small camel hair brush. One or more of the strips of solder are bent around and placed on the borax flux. After this the flame of a blow lamp or gas blow pipe is directed on to the work. The clean part of the flame must be kept on the joint. This is generally a little distance from the tip, at a spot where the inner cone of flame is visible as a slightly different coloured cone. If the dirty part of the flame is used the work may be oxidized and the result prove a failure. As the metal is heated the borax will froth and turn white and finally melt. Soon the metal will appear to be red hot and the strip of silver will melt and flow around the joint.

The crux of the operation is to make the silver flow properly, and only experience can give the requisite skill to accomplish this. It is largely a matter of correct temperature and correct position of the flame; the metal will always follow the heat of the flame, and can be drawn, as it were, to the desired spot. If the work is at all delayed the flux may all be burned, but this can be remedied by application of a further supply from a spoon made from a piece of thick iron wire beaten to a spoon-like end. If this is placed near the flame of the blow lamp it will keep hot, and when dipped into the borax some of the latter will adhere, and it can then be conveyed to the desired spot.

When properly made, a silver-soldered joint is nearly as strong as the metal to which it is applied, and for all small work it is preferable to soft solder. The resulting scale on the work can be removed by filing and finishing with emery paper.

Should it be desirable to unsolder an article, the sweating process is perhaps the best when it can be carried out, the metal being heated, a small amount of flux applied, and the parts pulled asunder while the solder is molten. After any soldering process all traces of the flux or soldering acid must be removed by scouring the article in hot soda water or by the use of emery paper.

Some of the appropriate implements for hard soldering are illustrated in Fig. 8. The gas blow pipe (C) is used in conjunction with a small bellows of the kind shown on page 406. The gas burner (A) has a swivelling tube; when this is turned at right angles the flame is reduced to a tiny jet.

The method of silver soldering jewelry and similar objects is somewhat different. The worker places the articles to be united on a charcoal block (Fig. 8, E), or a soldering "wiz," and after applying the borax plays on the joint with a small blow pipe (D). The solder is cut into small pieces and placed in position



Solitaire Board, showing the thirty-three holes, arranged in the form of a cross, for the marbles.

with a pair of tweezers. The jobs are small, of course, and the heating source can be a spirit lamp or a Bunsen burner. The parts to be soldered are fastened together with binding wire. For quite tiny objects one can use a holding device (Fig. 8, B) consisting of a pair of clips mounted on a rod which is held in the hand or a vice. The clips have universal joints, so that the parts, when gripped by them, can be brought into contact and are held fast while being soldered.

SOLE: The Fish. A flat fish with firm, white flesh, and an excellent flavour, the sole should be cooked as soon as possible after it is caught, but in cold weather it can be kept for a few days without harm. There are two kinds of sole, one known as the lemon, the other as the Dover sole. The latter is superior in flavour, and therefore dearer. Steaming between two plates over a saucepanful of water is the best way of preserving the delicate flavour of fillets of sole. The fillets of the fish should be seasoned with pepper and salt and lemon juice.

Fillet of Sole. To bake fillets of sole, wash them well, removing the white skin, and roll each one into a round. Stand them in a greased pie-dish, add $\frac{1}{2}$ gill milk, and salt and pepper to taste, and place a small piece of butter or margarine on each fillet. Cover the dish with a plate, and bake the fish in a moderately hot oven for about 18 min. In the meantime prepare $1\frac{1}{2}$ gills white sauce, and brown some breadcrumbs. When the fillets are cooked, take them from the oven, roll them in the breadcrumbs, and then stand them in a line on a dish. Pour the sauce round and garnish the top of each fillet with a thinly cut slice of lemon.

Another method is to skin and fillet a small fish, season it, and then fold each fillet in two, doubling the thin end over towards the thick. Lay them on a greased baking-tin, add a tomato, cut into quarters, then cover the whole with a piece of greased paper, and bake for about 8 minutes. Serve the fish on a hot dish, with the pieces of tomato placed round it.

Baked fillet of sole may also be served with white sauce to which two heaped tablespoonfuls of grated cheese have been added. Some more grated cheese should be sprinkled over the fish after it is cooked and then browned under a gas grill.

Either whole or filleted, sole may be fried as directed in the article on Fish.

Sole may also be grilled, and a pat of maitre d'hôtel butter is a good garnish. Finely chop 1 teaspoonful parsley, add a squeeze of lemon juice and incorporate with sufficient butter to make a round pat. Place one on each portion of grilled sole when ready to serve. See Carving: Fish: Lemon Sole: Sauce.

SOLIDAGO. These vigorous herbaceous perennials bear yellow flowers in September and October. They flourish in ordinary soil and are easily increased by division in autumn and spring. The best kinds are Golden Wings, Shortii and canadensis, all about 5 ft. high. One, canadensis nana, is only 2½ ft. high.

SOLITAIRE. This game for one is played on a circular board containing 33 holes, each made to hold a marble. They are arranged in the form of a cross, each line containing 7, as shown in the illustration. Marbles are placed in the holes, except the centre one, and the object of the player is to remove them one by one until only one is left, and that one in the centre hole. The removing is done by taking one off the board when another is moved over it into an empty hole beyond, as in draughts. Moves can only be made in a straight line, not diagonally. It is by no means easy for the beginner to succeed in his task, as one false move will leave him with three or more marbles in such positions that they cannot be taken.

SOLOMON'S SEAL. This is an excellent hardy plant for shady places. It grows 3 ft. high and has arching leafy stems bearing



Solomon's Seal. Showing the rows of greenish-white bell-like flowers which hang from the undersides of the stems.

numerous greenish white flowers in May. It spreads rapidly and thrives in ordinary soil. Roots may be potted in autumn and placed in the greenhouse for spring blooming.

SOLO WHIST. This card game, generally known as solo, is played by three or four players with an ordinary pack of 52 cards. If only three play, either one suit entirely is omitted or only three hands are dealt, as the players agree. The cards are dealt three at a time to each player in turn, and the last round consists of a single card to each player, the final card, the dealer's, being turned up for trumps.

Each player either says "I pass" or makes a call. The lowest call is proposal, usually contracted to "prop". A player who proposes so in the belief that his hand is good enough, if backed by a reasonably good one by another player to make 8 tricks in the partnership. Any other player may take the proposal, pass, or make his own call.

The next highest call is solo. This is a call by a player when he undertakes to make at least 5 tricks, playing a lone hand against the other three. Above the solo call is misère. When a player makes this call he undertakes to lose every trick, despite every effort on the part of the other three players to make him take a trick. There is no trump suit in the misère call. Above misère comes abundance in any suit except trumps. A player declaring abundance undertakes to take at least 9 tricks, playing a lone hand against the other three. Abundance in trumps calls over abundance in a plain suit.

Above the last call comes open misère. When this call is made a player undertakes to lose every trick, his hand being exposed upon the table after the first trick has been played. The highest call of all is abundance declared, when the player, naming his own trumps, undertakes to win all 13 tricks against the other three players. A player making such a call has the right to lead.

When players are playing prop and take, or prop and cop, as it is more generally called, they may be sitting together on opposite one another, and in those positions they remain. No player may bid after once passing with the exception of eldest hand, who has the privilege of accepting a proposal.

In three-handed solo a player is sometimes allowed to bid a 6-trick solo, in which he names his own trumps and must take at least 6 tricks. Except abundance declared eldest hand leads and players should follow suit. If not, a player may discard or trump. The winner of each trick leads for the next. See Whist.

Somnambulism. See Sleepwalking.

SOOT. In summer, when fires are infrequent, soot accumulates only in small quantities, but in winter it forms a thick coating inside the chimney and it is most important to have it thoroughly swept and to arrange for the periodic visits of a sweep.

Garden Uses. Soot which has been exposed to the air for a few weeks is an excellent fertilizer for plants and can be scattered on the soil round about them. If placed in a bag suspended in a barrel of water, soot makes a useful liquid manure for ferns, chrysanthemums and other pot plants. Fresh soot, either alone or mixed with lime, is a good soil insecticide; it should be worked into the ground, not left on the surface.

SOOTHING SYRUP. The practice of dosing fractious and restless children with soothing syrups, soothing powders, and similar preparations is strongly to be deprecated. It may make things easier for the mother or nurse, but this may be at the expense of the child's welfare. If a dose of castor oil, or some other simple purgative, does not improve the child's temper, consult a doctor. See Aperient, Child, Teeth.



Sorrel. Hardy evergreen shrub much used in cookery, sometimes as a substitute for spinach.

SOPHRO-CATTLEYA. This name is given to a bigeneric orchid raised by cross-breeding between *Sophronecphala grandiflora* and *Cattleya*. It flowers during winter, and may be grown in well drained pots, or hanging baskets. The cultural requirements of *sophronecphala* are very much the same as for *cattleyas*. See Orchid.

SOPHRONITIS. This is a small group of dwarf growing evergreen orchids. The favourite is *grandiflora* with orange-scarlet blooms. It should be grown in pans or baskets suspended from the roof of the intermediate house. *Sophronecphala* needs a mixture of peat moss, and charcoal, and flourishes in a temperature which may vary from 55° to 70°, according to the season of the year. See Orchid.

SORBET. This is a water ice flavoured with fruit and liqueur. General directions for the making of water ices and the serving of sorbets will be found in the article on ices (q.v.).

Sore Throat. See Laryngitis, Pharyngitis, Throat, Tonsillitis.

SORREL: The Herb. The leaves of this herb are used as an ingredient of salads and soups. Seed should be sown in March in drills 6 in. apart, and the rows thinned out during the following month. The name sorrel is frequently applied to species of the genus *Oxalis*. See Oxalis, Spinach.

Use in Cookery. Sorrel is used in cookery chiefly for a soup and a purée, the purée being employed as a means of dishing and also as a garnish for entrées. It is especially suitable for serving with lamb, veal, or sweetbreads, and also as a garnish for poached eggs in place of spinach.

Sorrel must always be thoroughly cleansed, and it is better to use a hair sieve for making it into purée. Soda should never be put with sorrel when cooking it, on account of the acid contained in the leaves.

Sorrel Purée. To make the purée, pick and wash 2 lb. of sorrel and boil it in about 1/2 pint of water until quite soft, then drain it on a hair sieve until all the water is out of it. Clean the stewpan in which it was cooked, dry it and melt in it 1 1/2 oz. of butter. In this

try to a light brown 1 peeled and sliced onion, then add 1 oz. of flour, 1 dessertspoonful of brown sugar, and 1/2 teaspoonful of grated nutmeg. Stir all together for 2 or 3 min., then put in the sorrel and 1 1/2 gills of brown sauce. Season well and pass through a hair sieve.

Sorrel Soup. Sorrel soup may be made as a clear vegetable soup or it may be thickened by mixing in the yolks of 2 or 3 eggs to each quart of soup. If it is to be served as a vegetarian soup water must be substituted for stock. For the thin soup clean and shred fine 2 lb. sorrel, the best part of a large lettuce, 12 sprigs chervil, and 4 or 5 sprigs parsley. Sauté these in 2 oz. margarine in a stewpan, then add 2 pints well flavoured rich clear stock, 2 lumps sugar, and seasoning to taste. Boil up and simmer for 20 min., then clear the soup of fat, pour it into a soup tureen and serve with dice of fried bread.

For the thickened soup proceed as for thin soup, but when the whole is boiling, whisk up 2 or 3 yolks of eggs and add to them by degrees about 1/2 pint of the liquor of the soup. Stir these till all is just ready to serve, then draw the pan back from the heat and stir in the thickening. Cook for 2 or 3 min. without allowing the soup to come to the boil, then add some margarine, stir this in, and serve.

Souchong Tea. Souchong is a black China tea of a fine flavour suitable for everyday consumption or for blending. See Tea.

SOUFFLÉ. The meaning of this word is something puffed or blown up, and in cookery this condition is obtained through using the stiffly whipped whites of eggs and preparing the ingredients in such a manner that they rise upward as soon as the heat penetrates them. Baking powder is never added to get lightness, success depending on skill in preparation and the beating of the eggs. The delicacy of a soufflé renders it a most wholesome and favourite dish, and one which may be safely offered to invalids.

A soufflé is cooked directly it is mixed and served immediately before it has time to sink. It may be baked, in which case the oven must be exactly of the right moderate heat and kept at a steady temperature during the process of cooking, or it may be steamed in which case the water must be boiling in the saucepan before the soufflé tin is placed in it. Baked soufflés are served in the dishes in which they are cooked.

Before serving a steamed soufflé it is usually turned out on to a dish from the tin mould with straight sides in which it has been cooked. The mould is prepared by brushing it over with pure salad oil or clarified butter. A double band of white kitchen paper deep enough to stand 3 or 4 inches above the top of the mould and long enough to fold tight round and overlap should be also greased and tied round the outside of the mould. A row of paper is then greased ready to cover the top. The soufflé mixture should only fill three parts of the mould to allow for rising. The mould is then put in a pan of boiling water. See that the water only reaches half-way up the sides.

For baked soufflés fireproof earthenware, china or glass soufflé dishes are used. Oven table glass ware is an aid when making a soufflé, as the process of baking can be clearly seen. When serving, fireproof dishes are placed on another dish covered with a paper doily, unless the soufflé dish is provided with a plated or silver frame. Individual soufflés are baked and served in small paper or china cases. Any dishes or cases used must be first well greased. When three parts filled with a soufflé mixture, they are placed in a baking-tin and cooked until well risen and firm. Avoid any unnecessary opening of the oven door, as a sudden draught of air might cause the soufflé to sink. It should never be

left in either steamer or baking dish after it has finished cooking.

Sweet flavourings are added for light soufflé puddings, while cheese or fish, game and white meats make this quickly cooked dish into a savoury, a light luncheon course, or entrée. The main ingredients consist of flour, milk or stock, and new laid eggs. Any fish or meat used should be first pounded and passed through a sieve. Cheese should be grated. Fruit is not very suitable for sweet soufflé making, the best flavours being chocolate, vanilla, coffee, almond, or a delicate essence. Sweet soufflés can be steamed or baked; cheese soufflés are baked, fish and meat soufflés are steamed.

Cheese Soufflé. Melt 1 oz. butter or margarine in a saucepan, stir in $\frac{1}{2}$ oz. flour, and when the mixture is smooth add 1 gill milk, stirring the whole over a gentle heat until it thickens. Then take the pan from the heat and mix in 2½ oz. grated cheese. When the mixture is slightly cooled stir in, one at a time, the yolks of 2 eggs. Season the mixture to taste, afterwards folding in lightly the stiffly whipped whites of 3 eggs. Half fill a greased and fireproof soufflé dish with the mixture and bake it in a quick oven for 10 or 12 min. Sprinkle about 2 teaspoonfuls grated cheese over the top of the soufflé, and serve it immediately.

Chicken Soufflé. Make this by taking the flesh from a chicken and, after removing the skin and gizzards, cutting it into small pieces and pounding them well in a mortar. Season them with salt, pepper, and a grating of nutmeg, and add 1½ gills good white sauce and the yolk of an egg before passing the mixture through a fine wire sieve into a clean basin. Then work in lightly, but thoroughly, 1½ gills cream, partially whipped, and the stiffly whisked whites of 2 eggs, pour into a prepared soufflé tin, and steam gently for about 50 min. Let the soufflé stand for a minute to shrink slightly, then remove the paper from the tin, and turn out on to a hot dish. Serve at once with béchamel sauce. Game or rabbit can be used for this soufflé in place of chicken.

Chocolate Soufflé. This soufflé can be made from $\frac{1}{2}$ lb. breadcrumbs, 2 oz. sugar, 1 oz. grated chocolate, 1 pint milk, $\frac{1}{2}$ oz. butter, and 2 eggs. Boil the milk, chocolate and sugar together, then add the breadcrumbs and butter and stand the mixture in a cool place. When it is cool, add a few drops of vanilla essence and the yolks of the eggs, afterwards stirring in the whites, whipped to a stiff froth. Pour the whole into a well-greased glass or other fireproof soufflé dish, and bake it for 20 min. in a moderate oven until it is of a golden brown tint.

Fish Soufflé. To make this soufflé melt 2 oz. margarine in a saucepan, stir in the same quantity of flour, and mix them together over the heat for a few minutes. Then add 1 gill milk or fish stock, and stir until the sauce thickens. Put it into a mortar with $\frac{1}{2}$ lb. of any white fish and pound them well together, adding 3 eggs, one by one. Season the mixture carefully, rub it through a sieve, and mix it with 1 gill whipped cream. Put it into a prepared soufflé tin, and steam for

$\frac{1}{2}$ hour, then coat it with some good white sauce and decorate top with chopped parsley.

Lemon Soufflé. This sweet soufflé can be steamed. It is made by rubbing together a heaped tablespoonful of castor sugar and the grated rind of a lemon. Melt a piece of margarine about the size of a hen's egg in a small pan over the heat, add a heaped tablespoonful of flour, and mix the two smoothly. Cook them for a few minutes, taking care that they do not brown; then pour in a gill of milk, and stir the whole over the heat until it leaves the sides of the pan. Move the latter to the side of the heat, add the sugar and rind, and a little lemon juice, and then beat in separately the yolks of 3 eggs. Whisk the whites of 4 eggs, together with a pinch of salt, to a stiff froth and stir them into the mixture, blending the two well together.

Have ready a prepared soufflé tin, and decorate the bottom of it with halved glacé cherries. Pour the mixture in, and cover it with another piece of greased paper. Place the tin in a pan of boiling water and steam the soufflé for about $\frac{1}{2}$ hour, or until it is well risen and firm to the touch, then turn it on to a hot dish and serve it with lemon sauce. Orange can be used to flavour the soufflé, and sauce instead of lemon.

Liqueur Soufflé. Any kind of liqueur can be used to flavour this soufflé. Make it by melting a piece of margarine smaller than a hen's egg and then mixing in a well-beaten tablespoonful of flour. Stir the two over the heat until they are smooth, but do not let them brown. Pour in 1 gill milk, continue stirring for a few minutes, and draw the pan to the side of the stove before beating in separately the yolks of 2 eggs.

Add 1 tablespoonful castor sugar, a pinch of salt, and enough liqueur to flavour the whole to taste. Just before turning the mixture into a greased soufflé dish, stir in the stiffly beaten whites of egg. Place the dish in a tin of hot water in the oven, and cook the soufflé until it is firm and risen. If a sweet sauce is served, it can be flavoured with the same liqueur as that used for the soufflé itself.

Oyster Soufflé. To make this soup, Blanch and beard a dozen oysters and cut each into three or four pieces. Melt 1 oz. margarine in a stewpan, stir in smoothly 2 oz. flour, and mix them well together over the heat. Pour in 1 gill oyster liquor, and stir the whole until the flour loses its raw flavour and the sauce thickens. Take the skin and bones from $\frac{1}{2}$ lb. whiting, then put it into a mortar with the sauce and pound the two together, adding



Oyster Soufflé, coated with white sauce, and decorated with half slices of lemon

the yolks of 3 eggs, one by one, eat salt, pepper, and cayenne to taste.

Rub the mixture through a hair sieve, then stir into it the yolks and the stiffly whipped whites of 4 eggs. Pour the mixture into the prepared soufflé tin, and steam it gently for about $\frac{1}{2}$ hour, or until it feels firm. Serve it with a good white sauce poured over it, and garnish it with lines of finely chopped parsley or slices of lemon.

Potato Soufflé. To make this dish, rub $\frac{1}{2}$ lb. cooked potatoes through a sieve, add to them 1 oz. margarine, previously melted in a pan, and put in 2 tablespoonfuls milk, the yolks of 2 eggs, and seasoning to taste. Mix these well, then take the pan from the heat and stir in lightly the stiffly whisked white.

Turn the whole into a prepared soufflé mould, and steam the soufflé for about 40 min. in a saucepan containing enough boiling water to reach half way up the mould. Turn it on to a hot dish, pour some white sauce over it, and garnish it with chopped parsley or the yolk of a hard-boiled egg rubbed through a sieve. If preferred, the soufflé can be baked in a china soufflé dish in a moderate oven for about 2 hours.

Rice Soufflé. An excellent rice soufflé can be made by washing $\frac{1}{2}$ lb. rice and boiling it in 1 pint milk to which has been added 6 oz. margarine, and the same quantity of sugar. When these are cool, stir in the yolks of 4 eggs and add a little vanilla essence. Whisk the whites of the eggs very stiffly, then fold lightly into the rice, and pour the whole into a greased mould decorated with angelica and cherries. Steam the soufflé gently for about $\frac{1}{2}$ hour, and serve it with pan sauce. See Eggs, Egg Whisk, Entrée, Fireproof Ware, Ham, Mould, Onions, Sauce.

Sound Box. See Gramophone.

SOUPS: CLEAR AND THICK KINDS

Some Recipes for the Staple Item of the Dinner Menu

This article, which describes the making of various kinds of soup, should be read in conjunction with the article on Dinner, Luncheon, Supper. See also the entries on Article 100, Beef Tea, Broth, Broth, Clondine, Clondine Menu, Mutton, Soups, Scotch Broth, Stock, etc.

Soup is prepared by boiling meat or vegetables with water. It can be thickened with starchy substances or beaten eggs. It precedes the fish and meat courses at meals.

To make nourishing soups good stock is essential, and directions for preparing the various kinds are given in the article on Stock. It should be noted that when butter is mentioned in this article, margarine can be substituted. Directions for browning (or caramel) used for colouring soups are given in page 153, and for making roux to thicken brown and white soup, in the article on Sauces. Soups can be divided into five classes: Clear Soups, Broths, Thick Soups, Purées, Vegetarian Soups.

Clear Soups. Clear soup or consommé is prepared from first stock, and if that is ready all that is necessary is to provide extra seasoning, and a garnish.

The foundation of clear soup is always the same, the various names given to it on a menu

being merely dictated by the garnish. Spring soup, for instance, is clear brown stock garnished with delicate spring vegetables, including asparagus points, green peas, forced French beans, or new carrots, the last two cut small.

A good clear soup is made by the addition to any clear stock of minced beef and vegetables. An onion and a carrot, cut into small pieces, should be allowed to $\frac{1}{2}$ lb. beef and 4 pints stock. These should all be put into a saucepan, with 1 or 2 peppercorns, a sprig of mixed herbs (parsley, marjoram, and thyme), and the white of 1 egg. The soup should be whisked over the fire until frothy. After it has boiled it is left to simmer for about 30 min., then strained through a scalded cloth.

Consommé royal is made from brown stock with the addition of a savoury mustard, cut into fancy shapes. To make the custard, 1 egg is allowed to 1 tablespoonful milk or white



Fish Soufflé. Dish made from any white fish

stock. The egg is beaten with salt and pepper to taste, and stirred into the hot milk or stock. The custard is then steamed in a small greased basin for about 15 min. and allowed to cool. When it is cold the custard should be sliced with a knife which has been dipped in hot water, and then stamped into fancy shapes. These should be placed in the soup tureen and the boiling consommé poured over.

Clear soup can be garnished with cooked vegetables, shredded very finely, or with cooked vermicelli or macaroni, or small force-meat balls fried and well drained.

Julienne Soup. This favourite clear soup is made by the addition to 3 pints of clear brown stock of 1 carrot, 1 onion, $\frac{1}{2}$ large turnip, 1 strip celery, 1 tablespoonful green peas (cooked), pepper, salt, $\frac{1}{2}$ oz. butter. The prepared vegetables are cut into fine strips like matches. Melt the butter in a saucepan and fry the vegetables in this with the seasoning for a few minutes shaking them to prevent them from scorching. Drain them from the butter, add them to the hot stock, simmer for 30 min., keep well skimmed. The vegetables may be parboiled in salted water instead of frying in butter if preferred before simmering in the stock till quite tender. French beans, cooked and cut into thin strips, may be added instead of or with the peas.

Paysanne Soup. This clear vegetable soup is made by cutting into thin rounds about the size of a sixpenny-piece a carrot, a turnip, 2 leeks and a stick of celery. Fry these lightly in a saucepan containing a little butter, then add a pint of chicken or veal consommé and let the whole cook gently until the vegetables are tender. Just before serving, remove any scum that may have risen to the surface, and add a little chervil.

Broths. For this class of soups the stock is usually made by saving the liquor from meats boiled whole for table. The liquor should be strained through a hair or tannin sieve, skimmed free from fat and well seasoned. It is generally thickened with rice or pearl barley and a few fresh vegetables cut small and cooked in it. At the finish a small quantity of chopped parsley may be added. Sheep's head broth, mutton broth, Scotch broth or veal or chicken broth are some of the varieties of this description of soup or bouillon. Boil some vegetables in the liquor while cooking the meat to flavour the broth.

Pot au Feu. Pot au feu is the name given to the French national broth. To prepare it, put 1 lb. brisket of beef in a large saucepan with 2 quarts water, bring the latter to the boil, remove all scum from the top, and add salt to taste. Simmer all for $\frac{1}{2}$ hour, and in the meantime prepare 2 carrots, 2 leeks, 3 sticks of celery, a cabbage, 2 turnips, and a parsnip.

Cut the cabbage into two, tying the halves together, and peel and slice an onion. Cut up the carrots, turnips, parsnips, leeks, and celery, using only the white portion of the two last-named, and at the end of the $\frac{1}{2}$ hour add them to the soup, together with the onion, cabbage, 10 peppercorns, and a bunch of herbs. Simmer the whole with the lid on the pan for 1½ hours, then strain the soup and skim off the fat from the top. The soup should then be served in a hot tureen. This broth is often termed Croûte au-pot when French bread is cut into thin slices and placed in the tureen just before serving, the meat and vegetables being served as a separate course at another meal.

Veal Bouillon. Take 2 lb. scrap of veal and cut it into small pieces. Then put them into a saucepan with 1 quart boiling water and $\frac{1}{2}$ oz. of well-washed rice, boil up, and simmer gently for an hour. Add an onion, carrot, and 3 sticks celery cut in neat pieces. Cook until these are soft, and just before serving sprinkle in two tablespoonfuls of picked chervil. Skim and remove all fat before adding the chervil to it.

Thick Soups. These may be either white or brown according to the white or brown roux employed to thicken them, or to the nature of the stock used. Thick brown soups should be made with good stock and flavoured with vegetable. They may be thickened either with a brown roux, or with rice. If rice is used as a thickening it should be cooked previously and boiled up in the soup.

All brown soups should possess a rich deep brown colour whether made thick or thin. To improve the appearance of the soup it may be necessary to add a little browning, but this should be done with discretion.

In making either white or brown thick soups the quantities required for thickening are important, and the following may be noted: From 1 to $1\frac{1}{2}$ oz. flour will thicken 1 quart liquor. About 2 tablespoonfuls rice, etc., should be allowed to 1 quart stock and 2 to 3 eggs and 1 gill cream will make a sufficient thickening for about 2 or 3 pints of white soup. When eggs are added as a thickening, the soup must only be simmered and not allowed to boil up again, or the eggs will curdle.

The garnish for thick soups should not be neglected. If vegetables are to be used they must be neatly cut and freshly boiled. If no vegetable cutter is available the roots may be sliced or shaped evenly in dice. Small pieces of carrot take about 7 min. to boil, turnip 5 min.

Chicken Soup. A nourishing thickened white soup is made by cutting up an old chicken into small pieces, and putting the whole, together with the bones, into a saucepan containing enough cold water to cover it. Bring the bird slowly to the boil, skim the stock well, and add a carrot, a leek, two small sticks of celery all cut into small pieces, a bunch of mixed herbs, and $\frac{1}{2}$ teaspoonful salt. Simmer the soup for about 5 hours, remove all traces of scum, and then strain through a fine sieve. Let the liquor stand in a basin till it becomes cold, then pound some of the chicken meat in a mortar, moisten it with a little stock, and rub it through a sieve. Make a smooth white roux by melting a small lump of butter in a saucepan and mixing with it $\frac{1}{2}$ oz. flour, then add the liquor and pounded meat, and boil up the whole. Finally add $1\frac{1}{2}$ gills boiled milk and seasoning, and serve.

Giblet Soup. To make this thickened brown soup the giblets of a goose or turkey, or of a couple of chickens or ducks, are needed. Cleanse and cut them into small pieces; then melt 1 oz. butter in a saucepan, add the giblets, together with 1 lb. lean beef, and a small onion, $\frac{1}{2}$ a carrot, and a stick of celery, all cut into small pieces. Fry all these a pale brown, then add 3 pints stock or water, a bunch of parsley and mixed herbs, and salt and pepper to taste. Bring the soup to the boil, skim it well, then put the lid on the pan and let its contents cook gently for about 2 hours.

The giblets, etc., may then be strained out and the liquid poured into a clean saucepan. Mix $\frac{1}{2}$ oz. flour smoothly with the butter in which the vegetables were fried, brown and add half a glass of sherry or a little cold brown stock, add it to the soup, and boil up the whole. Put in 2 or 3 in. of cooked macaroni cut into thin rings, and stir it over the fire for a few minutes. Before serving the soup add more seasoning if desired.

Macaroni Soup. Boil 1 quart white stock, then add to it 2 oz. cooked macaroni and simmer for 5 min. Mix together the yolk of an egg and 1 gill unsweetened condensed milk, and add 2 tablespoonfuls grated cheese. Take the pan containing the macaroni away from the fire before adding the egg mixture, and then stir all over a gentle heat until the soup thickens. Season to taste, add 1 dessertspoonful of chopped parsley, serve with shrimps of toast and then hand round grated cheese.

Mulligatawny Soup. To make this thick brown soup, fry 1 carrot, 3 onions, cut small, with a head of celery cut into dice, in 4 oz. fat or butter until the onion begins to look clear, then add 2 tablespoonfuls curry powder and the same of flour. Fry all till the onions brown, then stir in by degrees 2 quarts good stock. Let all simmer till the scum has risen well and the vegetables are quite soft.

Pass the soup through a hair sieve, return it to the saucepan, adding a dessertspoonful of curry paste and seasoning to taste. Squeeze in a little lemon juice. The curry paste should be rubbed smooth with some of the liquor and dissolved before being added to the soup. Rice should be handed round with it.

Mushroom Soup. A quart of bone stock and $\frac{1}{2}$ lb. each of ox kidney and mushrooms are needed to make this brown soup. Cut the kidney into small pieces and roll them in flour, mixed with a little pepper and salt. Melt 1 oz. butter in a saucepan and fry the mushrooms, peeled and cut into small pieces. Add the kidney and the stock, and simmer for about 2 hours. Make a brown roux from a tablespoonful of flour stirred into a tablespoonful of melted butter and thicken the soup with this. Bring it just to the boil and serve it very hot.

Tripe Soup. For this white soup take $\frac{1}{2}$ lb. tripe, a turnip, a carrot, 3 onions, 2 tablespoonfuls cornflour, $\frac{1}{2}$ pint milk, 3 pints water, and a little sweet herbs, parsley, salt and pepper. Scald the tripe in boiling water and then cut it into small pieces. Having prepared and sliced the vegetables, put them in a saucepan with the tripe and water and simmer them for 1½ hours. Mix the cornflour to a paste with a little cold milk, add to the soup, and stir all well together. Just before serving add the rest of the milk, the herbs, parsley, salt and pepper, and serve the soup hot with croutons of fried bread.

Turkey Soup. This soup provides an excellent method of using up any cold cooked turkey. To make it, cut up the remains into small pieces and put these, together with the chopped bones, into a stewpan. Add a bouquet garni and a small blade of mace, a small peeled onion, 2 quarts white stock or milk and water mixed in equal proportions, and seasoning to taste. Put the lid on the pan, simmer its contents gently for about 3 hours, then strain the soup, and after rinsing out the pan pour it back again. Mix $1\frac{1}{2}$ oz. ground rice smoothly with a little cold milk, stir it gradually into the soup, then bring the latter to the boil and let it boil gently for about 10 min. Have ready 2 oz. freshly boiled macaroni or spaghetti, cut it into short lengths, and heat it up in the soup before serving.

Purées. This class of soups is made by rubbing the meat, fish, vegetables, etc., through a sieve after cooking. For vegetable purées, beans, carrots, peas, artichokes, potatoes, chestnuts, tomatoes, or celery are used. These are prepared and, if necessary, cut in small pieces. They are then tossed in butter for a few minutes and cooked in boiling stock. When done they are passed with the liquor through a sieve, then returned to the stewpan, boiled up, seasoned, and served in a tureen, with dice of fried bread handed round.

Vegetable purées are often white as when potatoes or artichokes are used. White stock must then be added instead of second brown stock and a small quantity of milk or cream must be boiled with them when finishing the soup in order to blanch it. White soups usually are seasoned still further with a dash of mace or nutmeg.

Carrot purée should be an orange colour and only the red parts of the carrot be used for it. Green pea soup may be made with second stock, and an economical version of it can be prepared by cutting up the pea shucks and adding them with the peas to the liquor, increasing the amount of stock in proportion to

the quantity of shucks. The shucks will boil quite tender if the peas are young, and the flavour after the vegetables have been passed through the sieve will be found excellent. About 2 lb. fresh vegetables to 3 pints liquor is the average.

Dried pulse vegetables make good and nourishing soups, and water may in all cases be substituted for stock. The pulse is soaked overnight, then washed and picked. It should be stirred, with a few fresh vegetables to give it flavour, notably onions, in butter or fat for a few minutes over the fire. The water is then added cold, and the whole boiled up together and cooked until the pulse is perfectly soft. The soup should be passed through a wire sieve or colander, and afterwards returned to the saucepan in which it was boiled, well seasoned and thoroughly heated ready for serving.

A bacon bone or one or two rashers are often added to lentil soup. The bone is removed before the soup is sieved, but the rashers, if minced small, will pass through the sieve with the lentils. To pea soup ham or bacon bones are sometimes added and boiled with the peas, they must be removed as soon as the peas are soft enough to sieve. For soup made from split peas it is better to use the liquor from salt beef after it has been boiled, but first ascertain that it is not over-salted. The liquor from any boiled meat may be used, or a weak stock. Plenty of fresh vegetables must invariably be cooked with dried pulse to give the right flavour.

Haricot beans make an excellent white soup, but only celery and onions are suitable for adding as a vegetable flavouring. This soup should be finished with a small quantity of milk. The amount of pulse required for each quart of water is about $\frac{1}{2}$ pint, $\frac{1}{2}$ pint milk is the usual quantity for finishing 1 quart white soup. Fish purée is made with fish stock, thickened with white roux, seasoned and finished with milk or cream. The fish is cut up and flaked, all bones and skin removed, cooked in stock till tender and then passed through a sieve before adding the cream.

Parmentier Soup. A good creamy potato purée can be made by slicing 3 large potatoes and the white part of 3 medium sized leeks, frying them lightly in a saucepan containing 1 oz. butter, and then adding 1 pint veal or chicken stock. Cook the whole gently until the potato is tender, then rub it through a fine sieve. Reboil it, and before serving add seasoning to taste, 1 gill cream, 1 oz. butter and a little chervil.

Parsnip Purée. The ingredients consist of 1 pint milk, 1 quart bone stock, 4 parsnips, 1 onion, 2 sticks celery, flour and seasoning. Clean and slice the vegetables, fry them in dripping, and then add the stock. Let the whole simmer until the vegetables are tender, then rub them through a wire sieve and return the purée to the stewpan. Add the milk, seasoning and the flour mixed smoothly with a little milk, and cook the soup for about 5 min. Serve it with croûtons of fried bread.

Spinach Soup. Cook the spinach, make it into a purée, then stir it in butter for 6 min. and add boiling white stock and a little cream. The quantities required are 2 lb. spinach, $\frac{1}{2}$ pint stock, 2 oz. butter, $\frac{1}{2}$ gills cream. Flavour with lemon and nutmeg, and add the stock to the purée by degrees.

Tomato Purée. Trim and wash three leeks, holding them under running water so as to rid the inner leaves of grit, then cut them into small pieces, and fry them gently without browning them for a few minutes in a pan containing 1 oz. fat.

Add to them $\frac{1}{2}$ lb. tomatoes previously wiped and cut into quarters. Fry these also until they are tender, and then pour over them $\frac{1}{2}$ pints stock. A bunch of mixed herbs should

also be added, and the whole boiled up rapidly. Then season it to taste, and after cooking it slowly for about $\frac{1}{2}$ hour rub it through a fine sieve.

In the meantime rise out the saucepan then pour the soup back, add a teaspoonful milk, and reheat the whole. Just before serving the soup add a lump of butter about the size of a hen's egg, and, if necessary, a little more seasoning.

Vegetarian Soups. The recipes for the pulse soups given may be adapted for vegetarian soups by using vegetable stock, milk and water or milk in place of meat stock. For other vegetable soups the vegetables are cut thin, fried in butter as for a purée, before adding the liquor. Onion soup and leek soup should be thickened with white roux. For white soups the vegetables must only be stirred long enough for the butter to be absorbed, if the soup is to be brown they must be well fried. After they have been cooked in the butter, they are boiled and passed through a sieve. Onions, leeks, and a touch of garlic are necessary for these soups to increase the flavour. They are seldom thickened except with dried or baked pieces of bread.

Another class of white vegetable soup is made by shredding lettuce, the hearts of spring cabbages, cucumber, spring onions, and various salad herbs. These shreds are stirred in butter for 8 min. without colouring them. They are then moistened with vegetable stock, a little nutmeg is added, also seasoning, boiled up and simmered for 15 min. Just before serving the soup is thickened with a liaison of eggs and cream. Bonne femme soup is made much like the foregoing. 4 lettuce, 1 cabbage and a good handful of salad herbs being required, and about 3 pints vegetable stock and 2 oz. butter.

Vegetable Bouillon. A purely vegetarian broth is made from the following vegetables prepared, cut up into small pieces and placed in 4 quarts boiling water to make 2 quart-soup after simmering for 4 hours. 8 oz. carrots, $\frac{1}{2}$ oz. haricot beans, $\frac{1}{2}$ oz. lentils, 4 oz. potatoes, 4 oz. turnips, 3 oz. leeks or onions. Add salt to taste.

SOUP MILK : Medical Uses. Poisonous substances resulting from the putrefaction of protein food in the bowel have been blamed for causing or aggravating various disorders, such as acne, boils, eczema, enteritis, neurasthenia, and arterio-sclerosis. It is often attempted by the use of soured milk to diminish or prevent this auto-intoxication. The lactic acid bacilli contained in sour milk multiply in the bowel at the expense of the putrefactive bacteria. A pint of soured milk is taken daily, in two or three portions, at meals, or preferably between meals. The soured milk is taken for three weeks at a time, and should be persevered with even if constipation ensues, which it frequently does.

Ordinary buttermilk is sometimes used, but milk artificially soured by the Bulgarian bacillus is better, as this bacillus appears to be more active and more resistant than the ordinary lactic acid bacillus found in buttermilk. Solid and liquid preparations containing the Bulgarian bacillus are on

the market, but it is better to use the products of a good dairy, when these can be had. It is very important, when undergoing the treatment, to avoid meat extracts of all kinds, white of egg, fat meat, and high game, as these form a good food for the putrefactive bacteria which it is desired to destroy.

Sour Milk Scones. To make these, take $\frac{1}{2}$ lb. flour, $\frac{1}{2}$ teaspoonful cream of tartar, $\frac{1}{2}$ pint sour milk, 1 teaspoonful bicarbonate soda, 1 teaspoonful golden syrup. Add salt to flour, then mix in all dry ingredients. Add the syrup to the sour milk, pour into flour, etc., and mix lightly. Turn on to a floured board, and knead quickly until smooth. Roll out into a round $\frac{1}{2}$ in. thick, divide into four or six pieces, and cook in a hot oven or on a griddle until well risen and browned. The scones should be served hot.

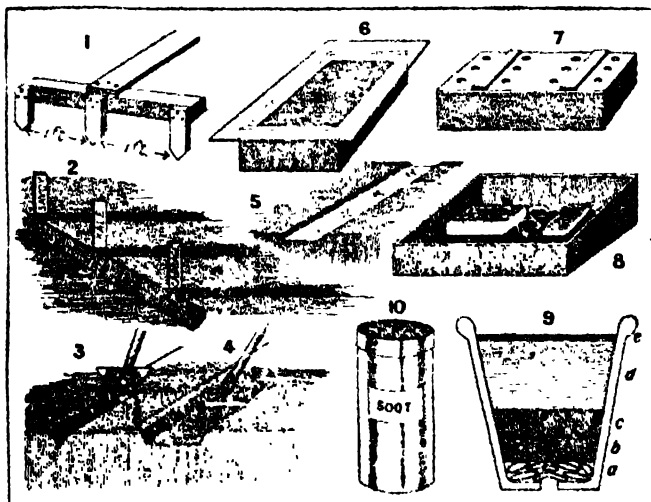
Sour Milk Cheese. Allow the milk to become very thick and curdled, then put the solid curds in a piece of clean muslin. Tie this up and suspend it on a hook in a cool place where all the moisture can drip from it. When it is dry and crumbly take the bag and dip it quickly into boiling water. Do not let it stay in the water more than a minute or so. Let it dry again, then put the curd in a basin and beat up with salt and pepper to taste. Press into a mould or make into a pat, and cover with greaseproof paper. The cheese will keep several days in a cool place. See Milk.

SOUTHDOWN MUTTON. A fine special breed of sheep fed on the Sussex downs is noted for the quality of its meat which is known as Southdown mutton. A leg of this mutton, in particular, is considered a delicacy, but the chops and cutlets are also esteemed. See Mutton.

SOUTHERNWOOD. This is a shrubby plant *Artemisia abrotanum*, which grows 3 ft. high and bears fragrant greyish leaves and yellow flowers in late summer. It flourishes best in light or well-drained soil and is increased by cuttings in a frame in August. Other names for this plant are lad's love and old man.

SOWING : Of Garden Seeds. The commonest errors made in sowing seed are to sow too thickly or too deeply, and to allow insufficient drainage to seeds sown in pots, pans, and other receptacles. As to depth of sowing it is a good practice to cover seeds about twice their own depth.

Vegetables as a general rule are best sown in drills shaped like a V to the desired depth by means of a hoe, but in the case of beans and



Sowing. 1. Home-made drill rake. 2. Drills drawn and labelled. 3. Triangular drill. 4. Flat drill for beans, peas, etc. 5. Economical group sowing. 6. Seed-box with glass covering. 7. Drainage holes for same. 8. Seed-boxes and pots in frame. 9. Pot prepared for sowing: a, crocks; b, soil fibre; c, chopped turf; d, good soil; e, fine soil and sand. 10. Soot sprinkler.

peas it should be flat or saucer-shaped, as shown in the diagram. Other drills are also pictured. Always use a taut garden line when chopping out or drawing drills to ensure straightness. Sufficient seed should be placed to provide good rows, an old garden maxim being one for posts, one for the weather and one for the harvest crop.

The following quantities, in portions of ounces or punts, will be found ample for good rows of vegetables 100 ft. long: Broad beans, French beans, and scarlet runners, $\frac{1}{2}$ pint; broccoli, Brussels sprouts, cabbage, cauliflower, leek, kale, lettuce, onion, savoy and turnip, $\frac{1}{2}$ oz.; carrot, parsnip, radish, and swede, $\frac{1}{2}$ oz.; beet chervil, and spinach 1 oz.; peas, 1 pint.

Hardy annuals are usually sown out of doors in March and April where they are to bloom in summer; many may be sown in August-September to provide late spring and early summer flowers. Biennials, e.g. sweet william and Canterbury bell, are sown in May; hardy perennials under glass in spring or out of doors in early summer. See Frame. Hotbed; Propagation, Seed.

SOY. This sauce is usually bought ready prepared. Its chief ingredient is the soya bean, which is imported from China, Japan and Manchuria. Japanese soy, made from soya beans, coarse barley meal and salt in equal weight, is usually the most popular. It should be brown in colour, of a thick consistency and clear. Chinese soy contains varying amounts of sugar, mace, ginger and pepper, and has a sweet treacly flavour. Japanese soy is largely used in the making of store sauces. See Sauce.

SPADE. There are several varieties of spade, and many fancy shapes, but the one with the simple, broad, straight edge is the



Spade. Correct position in which to hold the spade before thrusting it into the earth.

best for general purposes in the garden. The handle grip usually fitted is of the type known as the eye handle, and is strengthened with a rivet through the gripped part. Another type (illustrated in a c) is T-shaped, having a short length of round wood attached at its centre to the end of the handle.

Much labour is wasted in digging if the spade is not properly used. The spade should be held nearly vertically over the ground where it is desired to dig, the left hand being a good way down the handle. The right hand grips the end of the handle. A sudden downward

motion follows this. Having pushed the spade as far as possible into the soil with this downward thrust, the left foot is planted on the blade on the left side of the handle. The weight of the body is used to



Champion field spaniel, with close-up of head (top left). (By permission, H. B. B. Co.)

sink the blade still lower into the ground. Using the unbroken ground at the back of the spade as a fulcrum, the earth is prised up on to the blade of the spade by a downward and backward movement of the right hand. If this operation is found very difficult the earth may be loosened by moving the spade backward and forward before attempting to prize the mass. To turn the earth over or to throw it to any desired place, the left hand is used for raising the blade end of the spade. The last operation consists of turning over the earth, the spade being tilted over sharply to free it from the earth. See Digging.

SPAGHETTI. A particularly fine make of macaroni, spaghetti is easily digested and can be given with safety to invalids.

Savory Spaghetti. To prepare savory spaghetti, melt 1 oz. margarine in a saucepan and fry in it for a few minutes 1 lb. sliced tomatoes and a peeled and sliced onion. Then add $\frac{1}{2}$ pint stock and $\frac{1}{2}$ teaspoonful of mixed herbs tied in muslin, bring the whole to the boil, adding seasoning to taste, and then simmer it until the vegetables are tender. Break $\frac{1}{2}$ lb. spaghetti into small pieces, wash it well and cook it in boiling salted water until it is tender. Take out the herbs from the tomato sauce, rub the latter through a sieve and then put it back into the saucepan, thickening it with $\frac{1}{2}$ oz. cornflour previously mixed with a little cold water.

Boil the whole for a few minutes, keeping it well stirred, and then mix in the cooked and drained spaghetti. Grease a pie dish, cover the bottom of it with 2 oz. grated cheese, then pour in the tomato and spaghetti mixture and over the top sprinkle another 2 oz. grated cheese. Heat the whole in the oven, and then brown the top beneath a grill before sending it to the table. See Macaroni.

SPAN. As a measure of distance this is 9 in., which is approximately the distance between the tip of a man's thumb and little finger when his hand is outspread. In architecture it is the spread of an arch between its abutments.

SPANDREL. A spandrel is the corner space between an arch and its surrounding frame. If the arch is in a colonnaded oak bed-head, there are two spandrels, one on each side of the arch. If a circular panel is used in a door, there are four spandrels, each roughly triangular, occupying the space between the ring and the enclosing frame. Spandrels are found in inlaid sideboards of the Sheraton and other styles.

SPANIEL. The generic name of spaniel is applied to seven of the most useful varieties of gun-dogs. They are the clumber, cocker, English and Welsh springers, field, Irish water,



and Sussex. The cockers and springers are most used, performing the dual function of springing and retrieving the game. They are generally docile and friendly of disposition, the exception being the clumber, who does not lavish his favours upon strangers. The spaniel's length of muzzle allows free olfactory development, securing highest scenting

powers. See Clumber; Cocker; Dog; Japanese Spaniel; Kennel; King Charles; Mangle, etc.

SPANISH BROOM. This beautiful hardy shrub (*Spartium junceum*) bears slender, rush-like branches, and yellow flowers in summer. Spanish broom will thrive in ordinary garden soil, especially if light and sandy. It does not care for stiff, heavy soil. Propagation is by seeds, sown in the open in autumn or spring, or by cutting of young shoots raised in frames in the summer-time.

SPANISH CHESTNUT. This is a hardy, summer-leaving tree (*Castanea sativa*) 20 ft. to 50 ft. in height, which flourishes in ordinary soil and a sunny position. The nuts are ripe in late autumn. Propagation is by sowing the nuts in early spring, and transplanting the seedlings when they are one year old. The timber is of value to the woodworker, as it is hard and heavy and is sometimes used as a substitute for oak. See Chestnut.

Spanish Fly. See Cantharides.

SPANISH FOWL. One of the oldest breeds of poultry known to British breeders is the Spanish fowl, which is an excellent layer of large white eggs averaging 24 oz. and in some strains even more. It is a moderately large bird, with a fair quantity of white flesh, and although it is a black-plumaged bird its skin is delicately white.

A single-combed breed, the Spanish fowl carries large white lobes that spread over its face until they meet beneath the wattles. The comb and wattles are red, the plumage rich, glossy green-black, legs and feet slate blue. See Fowl; Poultry.

SPANISH IRIS. The common name for *Iris xiphium* is Spanish iris. It is one of the most useful bulb plants for display in the



Spanish Iris, popularly known as the poor man's orchid and invaluable for providing out blooms.

garden, and for providing cut flowers of many shades of colour. It has been called the poor man's orchid. Spanish irises should be planted 3 in. deep and 6 in. apart in early autumn. See Bulb; Iris; Planting.

SPANISH OMELETTE. To make this, finely chop a shallot and a clove of garlic fry them to a pale brown colour in 1 oz. butter, and then add 4 stoned olives cut into small dice. Beat up 4 eggs, add 2 tablespoonfuls sherry (if desired), and seasoning to taste, and pour them on to the mixture.

Stir the whole over the heat until the eggs begin to set, then tip up the pan and shape the omelette to an oval form. The upper side can be lightly browned by turning the omelette. Serve it with a little hot Espagnole sauce. See Omelette; Sauce.

SPANISH ONION. This large variety of onion, eaten in quantity, is said to benefit people who suffer from boils. An old remedy to hasten the breaking of a boil consisted in applying a hot poultice made of roasted and mashed onion. See Onion.

SPANNER: For Nuts and Bolts There are two main kinds of spanner in general use. Within its limits the adjustable type can be made to fit almost any nut as occasion demands, the fixed or key pattern is rigid but can be obtained in various sizes.

Cycle spanners, or wrenches, are perhaps the most common of the first type. These can be adjusted by means of a nut, which is generally in the handle of the tool. The fixed size spanner is often double ended, the two ends differing in size by about $\frac{1}{4}$ inch. In box-type spanners the ratchet is capable of taking the whole thickness of the nut to be unscrewed, reducing considerably the risk of the spanner slipping off the nut. Some are tubular in form, with a T-handle, a cranked arm, or just a hole through which a loose "tommy" bar can be put to give leverage. The tubular type is usually supplied in sets, the smaller sizes nesting inside the largest one. Since they are often double ended, a complete set takes up quite a small space.

Ratchet spanners are handy and take two main forms. In one sort the spanner itself is box shaped, fitting into a holder to which is attached a ratchet handle. In the other kind the spanner resembles the ordinary flat double ended type, but the jaws are disk shaped, interchangeable, and formed with ratchet teeth on the periphery. There is a pawl in the handle which engages with a tooth of the jaw and forces it round as the handle is moved forward and backward.

The cone spanner is for tightening up cones, as on an ordinary bicycle, without removing the wheel. Being made of thin material the spanner can be placed on the cone, and the latter turned the required amount, if the spindle nut is slackened sufficiently. Another handy type for a cycle is the spoke spanner. It fits over the nut on the rim ends of the spokes, and can be turned without taking the spanner off the nut, thus adjusting the tension of the spoke.

In using an adjustable spanner the open end of the jaws should face in the direction of the turn. There is then less tendency for the spanner to slip over the nut. If the nut is exceptionally tight, it should be remembered that a sharp tap, or series of sharp taps, on the end of the handle of the spanner is more likely to effect a movement than prolonged pressure. In some cases it may even be necessary to heat the nut before it can be unscrewed. See Wrench.

SPAN ROOF. The common form of roof for a dwelling-house is the span roof. It is formed by roof plates fixed to the walls, common rafters and a ridge board, all framed

together to cover the space between two walls. Such a roof can take a span of 12 ft. if a greater span is to be covered, purlins will have to be introduced, or principal rafters in the form of a truss. See Purlin; Roof.

SPARAXIS. These bulbs, which bear brilliantly-coloured flowers on slender stems 15 in. high in early summer, may be potted



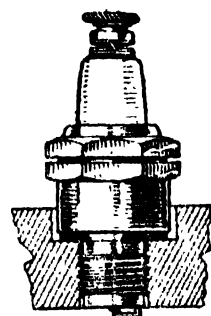
Sparaxis, a early flowering bulbous pot plant

in autumn or early spring and grown in the greenhouse, or they may be planted out of doors in well drained compost of loam, leaf-mould and sand in a sunny sheltered position. In wet weather in winter a temporary glass covering is beneficial. The bulbs may be left undisturbed for several years. There are many named varieties.

SPARKING PLUG. In all types of petrol engine the high tension spark from the magneto or coil is conveyed to the inside of the cylinder by means of a sparking plug and caused to jump across a gap, thereby firing the mixture.

Plugs can be purchased for long, short, or medium reach, the distance from the point of the central electrode to the seating of the plug varying according to the type of engine to which it is to be fitted. The end of the plug should be approximately level with the inside surface of the combustion head or the face of the valve cap, as shown in the diagram.

The sparking plug consists of a steel shell screwed into the body of the cylinder or the inlet valve cap. Inside this shell is fitted the central electrode, which is surrounded by a



Spark Plug used in an internal combustion engine

stout casing of some insulating material, such as porcelain, mica or stearite, and thus insulated from the outer shell. At the bottom of the outer shell is a small projection so placed as to be close up to, but not touching, the central electrode. The high tension current that flows from the magneto via the high tension lead and the central electrode jumps across this gap,

returning to the magneto via the outer shell of the plug and the metal work of the engine.

In order to ensure a gas-tight joint between the insulation and the outer shell a brass gland nut is generally employed. When a plug has been in use a considerable time it is often possible to tighten the gland nut down a little owing to the fact that the gland packing will have contracted. This adjustment should only be made while the plugs are warm, and it will necessitate also the checking or re-setting of the gap or amount of space between the points of the plug.

The proper setting is highly important, especially in regard to the starting up of an engine, because the wider the points are apart the stronger is the current required to jump across. Thus, with a magneto, a greater initial speed will have to be given to the engine before a high tension spark of sufficient intensity can be developed. The gap for magneto and for coil ignition must be kept at the width stated by the makers.

Testing Ignition. Sometimes a fault in the ignition is put down to the magneto because a test of the plugs has been made by turning the engine over very slowly while passing a finger on the terminal of the plugs and noticing whether a slight shock is felt. This procedure is wrong because it in no way proves that a current is passing across the points. Further, it is possible for a plug to function properly at a low voltage, and yet to short badly on a high voltage through insulation failure, such as a cracked porcelain body.

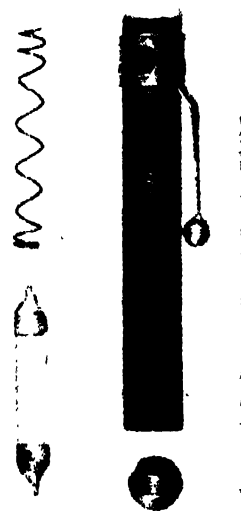
One way to test for insulation failure is to take the plug out of the engine and lay it on some metal part with the high-tension lead attached. The metal shell must be touching some metal engine part, but care must be taken that the plug terminal is not in contact with, or too close to, any metal. Then, by revolving the

engine at a good speed by hand or by the self-starter, the sequence of sparks at the points can be noted. The spark should be regular and of a uniform intensity, otherwise the insulation is at fault, assuming the plug is perfectly clean. A better method is to use a neon tester, consisting of a small tube containing neon gas. With this device the plug need not be removed.

The tester is suitably protected, and has a terminal which is placed in contact with the terminal of the plug to be tested. If the plug is sparking a characteristic red glow is seen in the tube.

For other details about sparking plug troubles and their remedy the reader should refer to the article on Motor Car, especially parts 1 and 2 of the section dealing with the care of the car. See Internal Combustion Engine; Magneto.

SPARKLET. Plain water can be converted into soda water by the use of metal



Spark Tester. Tube containing neon gas, a device for testing ignition which obviates removal of plug

capsules known as sparklets. They are sold by chemists, and aerate the water or charge it with carbonic acid gas. *See Aerated Waters; Carbonic Acid; Soda Water.*

Sparling. The name is sometimes given to the snail (*q.v.*). Occasionally a young or very diminutive herring is called a sparling.

SPATCHCOCK: In Cookery. Spatchcock chicken is prepared by splitting a young bird down the back, brushing it over with some warmed and melted margarine, and then coating it with a mixture prepared from a little made mustard mixed with 2 tablespoonfuls Worcester sauce, a piece of margarine about the size of an egg (previously melted), and seasoning to taste. Sprinkle the chicken with bread-crumbs, then coat it with some more melted margarine, and grill it over gentle heat. Serve the bird with piquant sauce. The neat appearance of spatchcock chicken is gained by breaking the legs and wings at the first joints and fixing them in a flat position with skewers. *See Chicken; Sauce.*

SPAVIN. This is a disease affecting one or both of the hocks of horses, cobs, and ponies, and it is exceedingly common. A swollen condition of the hock, especially after the animal has been standing in the stable, following upon active work, is spoken of as bog-spavin. The hock is swollen and puffy, imparting a soft or boggy sensation to the fingers when these are pressed upon it, particularly at the front and sides. This condition does not actually constitute disease, unless it amounts to a considerable degree of distension, thus interfering with freedom of movement of the hock. Apart from this, it does not render the animal in any way unsound. Bone spavin is regarded as constituting unsoundness. No one should purchase a horse without having it examined previously by a veterinary surgeon. *See Horse.*

SPEAR GRASS. Spear grass, which in some instances is called the bayonet plant, is the hardy rock perennial *Aciphylla*. There are three species in cultivation, *lyallii*, *colnsoni*, and *squarrosa*, all about 6 in. high. Spear grass is best planted in rich sand loam, during spring or autumn, in an open part of the rockery. *See Rock Garden.*

SPEARMINT. The fragrant herb called spearmint is sometimes known as lamb mint, and has lance-shaped leaves of pungent odour. Other familiar kinds are peppermint and pennyroyal. Of the several kinds of garden mint, spearmint has the finest flavour.

Spearmint is sometimes used as a flavouring for milk or batter puddings, and can be regarded as suitable for either sweet or savoury dishes. *See Mint.*

SPECIAL LICENCE. This term is used for a marriage licence issued by the archbishop of Canterbury. It permits a marriage to be celebrated at any place, with or without previous residence in the district, and at any time, but the reasons given on application must be regarded as satisfactory by the archbishop's advisers. The fee for a special licence is £25, and application for one must be made to the Faculty Office. The term special licence is often wrongly applied to a licence granted by a registrar. *See Marriage.*

SPECTACLES. The principal use of spectacles is to correct errors of vision. The particular type which should be worn is highly important. Much harm results from wearing spectacles or glasses of any kind which do not fit properly, or are not accurately suited to the purpose in view and the sight of the wearer.

The type of lens required can be determined only after skilled examination by an oculist or a sight-testing optician, and advantage should be taken of the facilities provided under the National Health Service. Incorrect

lenses are bound to injure the sight. The eyes should be re-tested every five years to ensure that the lenses are still suited to the sight defect.

If necessary, spectacles should be worn by children, and the frame should be of steel nickel plated, or solid nickel, with curl sides which hook behind the ears. The bridge of the frame should not bear directly upon the bridge of the nose; the weight should be borne by attachments which bear only on the sides of the nose. The lenses should be of such a shape that the child cannot easily look over or under them.

For adults the frame may be of platinum, gold, rolled gold, tortoiseshell, or other material, or even without any frames around the glasses, or a half-frame across the top of the lenses. Spectacles with curl sides are best adapted for those who require to wear their glasses continuously.

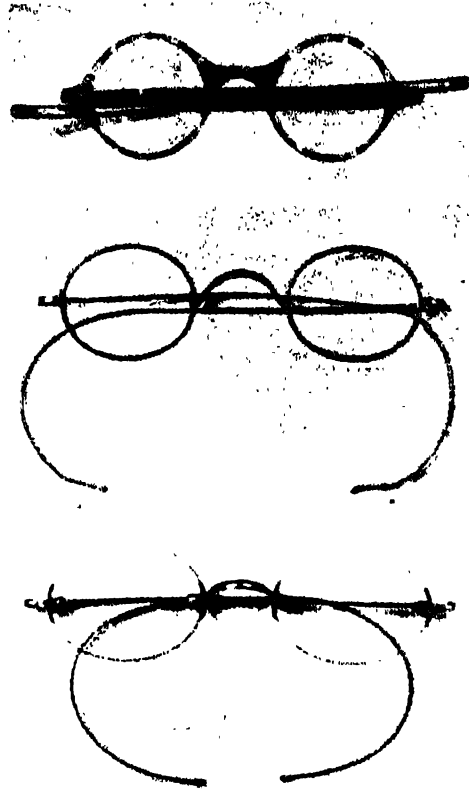
Where bright light irritates the eyes, spectacles made of 'crookes' glass are often worn. It is made in four tints, the two palest ones being most beneficial for absorbing the ultra violet rays; the two darker tints are suitable for bright sunlight and tropical climates. Deeply tinted glasses are also largely used in factories where there is a very bright light. These glasses are usually fitted up in the form of goggles, with fine gauze around the edges, to protect the eyes from flying particles of metal. Goggles of various forms are also used in strong winds and in sandy districts to protect the eyes.

Spectacles require great care in handling. They should not be put on or taken off roughly, and the greatest care should be exercised in closing down the sides lest the points be damaged or the frames bent; when not in use they should always be placed in a case. When the frames become bent, the defective vision is not properly corrected, therefore it is essential that they should be straightened by an optician.

Glasses should be wiped with a piece of clean old linen, or with special cleaners, which prevent the glasses from steaming, and give a bright, clean polish. If they are much soiled, they should be washed in warm water with soap to which a little ammonia may be added. *See Eye; Eyeglass; Sight Testing.*

Specularia. This hardy annual with purple, bell-shaped flowers is called Venus' Looking Glass (*q.v.*).

SPECULATION: A Card Game. This is a card game for any number of persons, and is played with the full pack of 52 cards, each player contributing an agreed number of counters to the pool. The dealer sits in twice as many counters as other players. He deals three cards face downwards to each player and



Spectacles. Top, pair with round lenses in tortoiseshell frame. Centre, steel rimmed with curl sides. Bottom, rimless pair with gold bridge and sides

himself, and turns up the next card for trumps. This last card the dealer has a right to, as well as the three he has in his hand.

The object of the game is to hold the best trump among the cards dealt. If the turn up is an ace, the dealer automatically holds the best trump and takes the pool. If it is a court card or a ten it becomes an object of speculation, and any player may try to buy it, the price being agreed upon between him and the dealer, on the off chance that the card is the highest trump and will take the pool. The dealer may elect to keep the card if he wishes.

Rules of Play.

Beginning with the eldest hand, each player in turn turns up his topmost card. If any player turns up a better card than the exposed trump, this card may become an object of speculation. The holder of the highest trump for the time being is accepted from turning up any more of his cards. If all cards are turned up without it being beaten he takes the pool. If his card is beaten he continues with the other players to turn over his cards one at a time in his turn. Any player turning up the ace of trumps at once takes the pool.

Any player may buy any of the unexposed cards from another player, in the hope that they contain the winning trump. If any card in his hand is accidentally looked at by a player, save the actual card he is turning up, all his cards are immediately thrown face upward in the middle of the table, and the player must then pay a penalty into the pool.

SPEECH: Its Defects. Human speech may be affected more or less seriously by a large number of complaints. When there is any blocking of the air passages, as by chronic catarrh of the nose, adenoids, nasal polyp, etc., the patient pronounces the letter M as ER, and N like ED. Treatment is to clear out the obstruction so that the child may breathe properly. After this, lessons in correct pronunciation should be carried out. Lispering may be due to carelessness in teaching the child to talk; the defect is well within his power to control.

Deafness coming on after disease in childhood, before speech has been solidly acquired, may end in deaf mutism. Another serious defect is aphasia, which is interference with the thought processes of speech and is due to some injury or disease of the brain.

Stammering and stuttering are not due to actual defect in the speech mechanism but to inability to control it on account of emotional disturbance. It is an expression of anxiety hysteria, and an attempt should be made to cure it by finding out the emotional disturbance that underlies the hysteria. Voice exercises, as in declaiming, and breathing

exercises may be beneficial by giving the patient confidence. See Deafness; Larynx; Tongue; Voice.

Speedboat. See Boat.

SPEEDWELL. This name covers a group of evergreen shrubs and hardy herbaceous plants of great garden value known botanically as veronica. They flourish in ordinary soil. The hardiest shrub is *Veronica Traversii*, 4 ft. high with white flowers in summer. *Veronica speciosa* of which there are varieties with purple, crimson, rose or white flowers 3 to 5 ft., is less hardy; it does well in sea-side gardens and in mild districts or may be grown in pots in the greenhouse.

Among the herbaceous border plants the best are *gentianoides*, 18 in., with pale blue flowers in May, *longifolia* and *subsessilis* 2 or 3 ft., blue, in August, and *spicata* 12 in., blue, in June. *Veronica rupestris* is a lovely low-growing blue flowered rock garden plant. The shrubby kinds are increased by cuttings in a frame in July, the others by division, or seeds in spring.

SPERMACETI. The fatty substance obtained from the sperm whale, and called spermaceti or cetaceum is quite a common basis of ointments. The ointment of spermaceti is made up of spermaceti 10 parts, white-beeswax 4 parts, benzoin 1 part, and almond oil 36 parts. These ingredients are heated for 2 hours. Spermaceti may be applied alone to inflamed, irritated surfaces for its emollient action. Pron. Sper-ma-se-te.

SPHAGNUM. Sphagnum moss, which is commonly found on peat bogs, is used extensively in the potting of orchids. Being extremely retentive of moisture, it keeps the fleshy roots of plants in sound condition, whilst its open, spongy character allows air to be admitted freely. Sphagnum does not decay like other mosses, a peculiarity that adds a good deal to its usefulness. See Orchid.

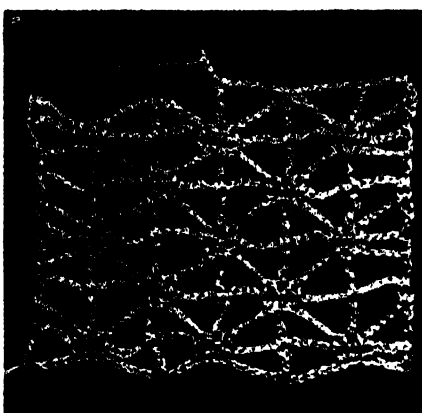
SPICE. Aromatic seasonings obtained from plants of tropical growth are used in cookery and as food preservatives, and some have certain medicinal properties. They are known as spices, those chiefly employed in cookery being cinnamon, cloves, ginger, mace, nutmeg, and pepper. Allspice or Jamaica pepper combines the flavours of cinnamon, cloves, and nutmeg.

In addition to their use in cookery, cloves are employed to flavour wine, cough mixtures, and confectionery, while cinnamon is a popular flavouring for liquors, and has certain properties that justify its inclusion in many tablets and mixtures sold to cure colic. Grated nutmeg is added to junkets and puddings, and ginger is a valuable stimulant. Various spices such as turmeric, coriander and ginger are contained in curry powders and pastes. Condiments such as pickles and sauces owe some of their piquancy to spices.

Spices should be bought only in small quantities; some deteriorate rapidly if exposed. They should be stored, separately, in tins with tight-fitting lids, or in special spice boxes. See Allspice; Coriander; Cinnamon; Cloves; Curry; Ginger; Mace; Nutmeg; Pepper; Turmeric.

SPIDER: A Crochet Pattern. This all-over pattern derives its name from the solid centre-piece of double crochet, from which long chains branch out in different directions. The foundation chain on which the work begins should be a multiple of 14 with 5 stitches over. In the small piece illustrated there are 47 chain stitches, worked as follows:

1st row. 1 double crochet in the 11th chain from the hook, 1 double crochet in each of the next 2 stitches, * 5 chains, miss 5 stitches, 1 double treble in the next stitch, 5 chains, miss 5 stitches, 1 double crochet in each of the



spider. The crochet stitch which goes by the name of the spider pattern

next 3 stitches. Repeat from * until only 6 stitches are left, then make 5 chains, miss 5 stitches, 1 treble in the end stitch, 7 chains. Turn.

2nd row. * 3 double crochet on 3 double crochet, 5 chains, 1 double treble on double treble, 5 chains. Repeat from * across the row, ending with 3 double crochets, then 5 chains, 1 treble in the 6th chain of the loop at the end, 1 chain. Turn.

3rd row. * 1 double crochet on double crochet, 5 chains, 1 double treble in the centre double crochet, 5 chains, 1 double crochet in the chain before the double treble, 1 double crochet on double treble, 1 double crochet in the chain after the double treble. Repeat from * across the row, then 5 chain, 1 double treble on the centre double crochet, 5 chains, 1 treble in the 6th chain of the end loop, 1 chain. Turn.

4th row. 1 double crochet on the first chain, * 5 chains, 1 double treble on double treble, 5 chains, 3 double crochet on 3 double crochet. Repeat from * across the row, ending with 5 chains, 1 double treble on double treble, 5 chains, 1 treble on double crochet at the end, 7 chains. Turn.

5th row. 1 double croc on the chain before the double treble, 1 double croc on double treble, 1 double croc on chain, 5 chains, 1 double treble on the centre double croc, 5 chains. Repeat from * across the row, 1 double crochet on chain, 1 double croc on double treble, 1 double croc on chain, 5 chains, 1 treble in double croc at the end, 7 chains. Turn. Repeat from the 2nd to the 6th rows inclusive, according to the length of pattern required, finishing the last pattern at the end of the 4th row to give a straight edge. See Crochet.

SPIDER WEB: In Embroidery. This pattern is used in two different forms of work, one as a solid white or coloured linen embroidery for decorative purposes, and the other to fill in an empty corner where threads have been drawn.

In the first case fancy canvases and coarse linens are used, when the threads can be easily counted to form sections. In the illustration coarse linen is seen, worked with coarse sylko cotton giving bold relief to the pattern. Here 40 threads are counted each

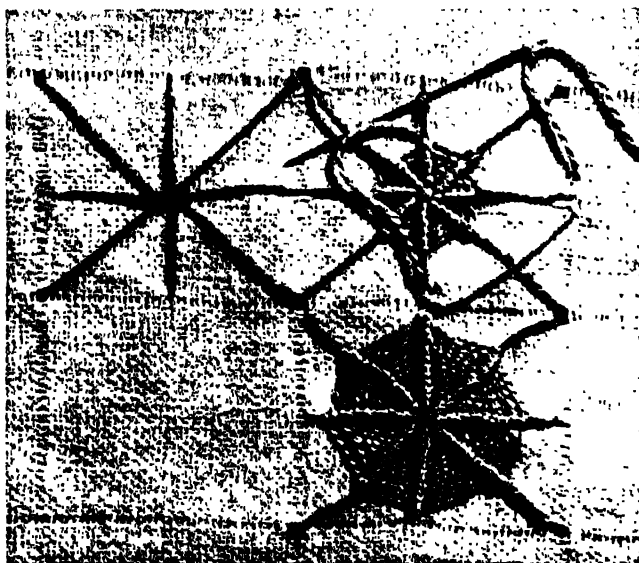
way and the next thread is drawn out at even intervals; this divides the linen into sections.

To work, secure the thread on the wrong side at one corner of a section and cross in an oblique line to the opposite corner then put the needle down to the wrong side. Bring the needle up again at the bottom right-hand corner and down again through the top left-hand corner—there will now be 2 threads crossing each other from the corners. Now cross the square in the same way but working from the 2 sides. Bring the needle up in the centre of this section and make a small stitch across the lines, then another stitch in the opposite direction, so that there is a small cross stitch in the middle holding the long lines in position. If one colour is being worked, the weaving can be continued without a break.

To join on a new colour, pass the thread back through the centre to the wrong side of the material and fasten off very securely with a few back stitches. Join the new thread under the back stitches and pass through to the right side at the centre of the design to the left of one of the spokes. Pass the needle from right to left under the same spoke and under the second spoke at the same time, and draw up the thread closely. It will be seen that the thread encircles the first spoke. Pass the needle from right to left under the second and third spokes and draw the thread up. As the second spoke was worked under in the previous stitch the thread will now encircle it.

The work proceeds in this way in rounds, always passing the needle under 2 spokes, so that the thread goes under and round a spoke each time. This causes the rolled effect on the finished web as seen in the third section of the illustration, with a web completed. The second section shows the web in progress, with the needle in position. Here the spokes are laid in one colour, and the little centre cross-stitch is made in that colour in the third section, giving a little spot of colour at the centre, while the web is woven in the second colour entirely.

For Drawn Thread Work. To work the spider-web on a drawn-thread corner, the working thread is secured to the buttonhole stitches that are usually worked on the edge of the linen after the threads are drawn. The spokes are attached to the edges in the same manner, but a cross-stitch cannot be worked at the centre, as there is not a material foundation underneath, so 2 drawn-thread knots are worked in opposite directions to hold the



Spider Web, a pattern which is much used in solid embroidery, and also for filling up a corner in drawn thread work

spokes at the centre. The latter are woven under and over as in ordinary darning missing 2 threads at the beginning of each new round, so that the thread that was passed over in the previous round will be passed under in the second.

The change of round can be seen easily in the working, when the needle passes a second time under the same thread. To ensure an even weave, it is best to put the material in an ordinary round embroidery frame when working the corner pieces, that is, when the remainder of the work is being done over the fingers. See Drawn Thread Work Embroidery.

SPIDERWORT. This is the popular name of tradescantia, a group of hardy and green-house plants. The best of the hardy kinds is *Tradescantia virginica*, called Flower of a day, which thrives in shady places and bears purple-blue blooms in summer. These suitable for a warm greenhouse are quick growing trailing plants with green and coloured leaves. They are useful for planting beneath the staging, or if grown in pots make a suitable edging; they look well also in suspended baskets. They are easily increased by cuttings and thrive in a compost of loam, leaf mould and sand.

SPILLIKINS: The Game. This game is played with a number of thin pieces of bone or ivory. These pieces, the spillikins, are cut into queer shapes and each has a number, the numbers usually running from 5 to 40.

The spillikins are taken in the hand of one of the players and dropped in a heap on the table. The players then take turns at trying to remove one of them from the heap without disturbing the others. This is sometimes done with the fingers and sometimes by means of two small hooks provided for the purpose.

When the game is over each player adds up the numbers on the spillikins he has taken, and the one with the largest number wins. Sometimes, instead of the players taking turns to remove one spillikin, one player continues to remove them until he disturbs another one, when he loses his turn.

SPINACH. There are four chief kinds of this useful leaf vegetable. Summer spinach is sown at intervals from February to April in drills 1 in. deep and 12 in. apart; rich deep soil is necessary to ensure quick growth. Winter spinach is sown in August-September in a similar way; the seedlings of both crops should be thinned to 6 in. apart. The round spinach is commonly sown in spring and the prickly spinach in August and September.

New Zealand spinach is a vigorous tender plant which should be sown out of doors in May, or raised in pots in a frame. The plants must be 3 ft. apart. The tips of the shoots

are gathered for cooking. Perpetual spinach or spinach beet is a rather coarse, large-leaved vegetable which should be sown in spring and again at the end of July to provide a long succession of produce.

How to Cook. Spinach is one of the most wholesome and readily digested of vegetables. It is served either as a vegetable or as an entrée. Spinach sometimes accompanies fried

and 2 tablespoonfuls white sauce, also 1 teaspoonful oyster sugar. Serve it on round croûtes of buttered toast with a garnish of fried half-moons of puff pastry or of bread.

A savoury dish of spinach can be prepared in the following manner. Boil 3 lb. spinach as directed in the second recipe. Chop it slightly, and fry it in 2 oz. margarine, with 4 anchovies, washed, boned, and chopped fine.

Add a good squeeze of lemon juice, seasoning of salt and pepper, a pinch of ground mace and 2 oz. muscatel raisins, stoned and cut in quarters. Serve the spinach on a dish with a border of grilled tomatoes and croûtons of fried bread.

Spinach greenening for colouring sauces is made by pounding 2 lb. well-washed spinach in a mortar until it is a pulp, then turn it into a clean pudding cloth and twist it one end one way and the other end the other way. Take care that the spinach is completely enclosed in the cloth and that a basin is placed underneath to catch the juice. The squeezing

is done better if two people hold the ends of the cloth. Pour all the liquid squeezed out into a small saucepan, place it on the heat, and, as it bubbles, scrape the curds out on to a sieve to drain off the water. After draining put the greening into a covered jar in a cool larder till the sauce is ready. Home prepared greening is best for sauce or mayonnaise, but for colouring sweets it is more convenient to purchase liquid spinach green colouring. See Kitchen Garden.

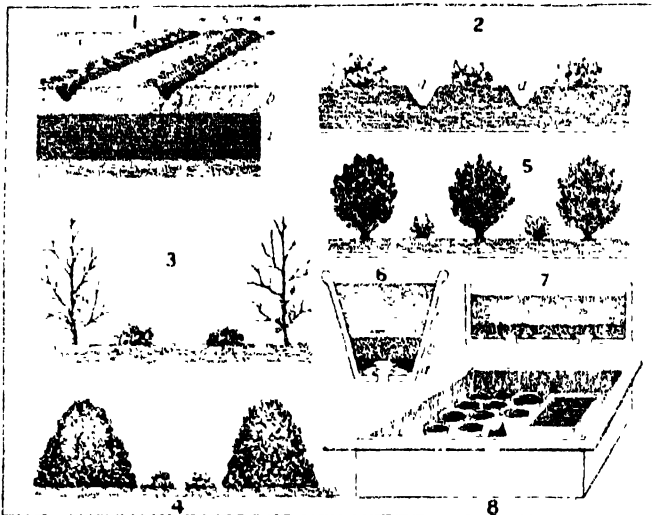
SPINDLE TREE. This is a small British tree (*Eunonymus europæus*) valued for its highly coloured ornamental fruits in autumn. It thrives in ordinary soil.

SPINE. The spine, or backbone, makes it possible for the body to assume and maintain an upright position and at the same time act as a protective covering for the spinal cord, which, with the brain, forms the main part of the central nervous system. It is made up of 24 vertebrae, which allow a certain amount of movement one on the other, and two terminal bones, the sacrum and the coccyx. The bodies of the vertebrae are separated by thin layers or disks of cartilage. These not only allow the bones to move without grating, but also act as shock absorbers.

When standing in the erect posture, the spinal column forms a series of natural curves from before backward. These curves balance each other, with the result that the general line of the spine is practically vertical.

Curvature of the spine is dealt with under that heading. Injuries to the spine by blows, twists, and other forms of violence may result in sprains or strains. There is local pain and tenderness, and perhaps slight swelling. Cold applications may relieve suffering, but it is often necessary to rest for some weeks. The result of an injury may, however, be much more severe than this. See Curvature; Fracture.

SPINET. Being smaller than the harpsichord, the spinet does not possess a double keyboard, and the tone was usually a fifth



Spinach. 1. Soil preparation: a, manured soil; b, fine soil. 2. Rows separated by rain channels (a). 3. Catch crops between peas or beans. 4. Winter spinach sheltered by heaps of bracken or straw. 5. Spinach beet between shrubs or under trees. 6. New Zealand spinach in pots: a, crocks and rough stuff; b, decayed manure; c, fine rich soil. 7. Box similarly prepared. 8. Pots and boxes sheltered in cold frame or covered box.

or grilled ham, and a favourite dish is poached eggs on spinach.

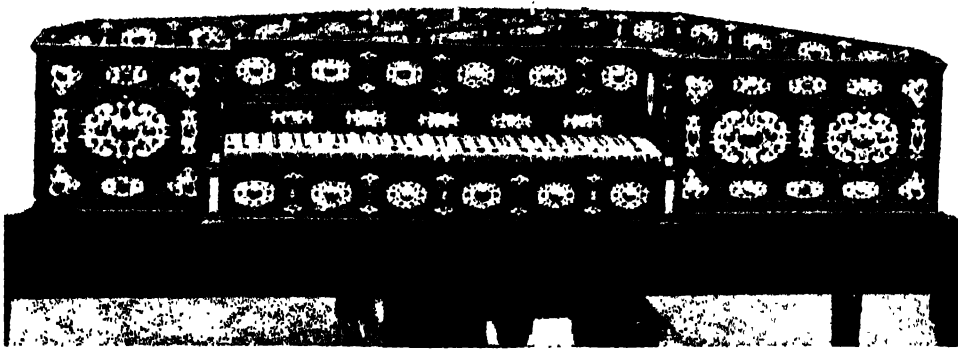
The leaves require very thorough and careful cleansing, as they are always gritty. They should be well picked over after being washed, and the stalks removed. Salt is required in varying quantities according to taste. No soda must be added to it while cooking and no water is required save that which clings to the leaves after washing. One of the simplest methods of preparing a plain dish of spinach is to put about 4 lb. of the leaves in a large saucepan, sprinkle over them a tablespoonful of salt and a teaspoonful of white sugar. Bring slowly to the boil and boil them for about 12 min., or until they are soft, stirring them in case they cling to the bottom of the pan. When cooked, strain and press out the water until the spinach appears dry, then turn it on to a board, chop it, and return it to the saucepan with a little margarine, lemon juice, pepper and salt. Dish it on toast.

For an entrée, prepare 4 lb. spinach, then boil it in the drippings from the leaves, adding

salt. Stir frequently, and when it is cooked strain and press it free from moisture. Now immerse it in cold water and leave to cool but do not separate it. When quite cold, drain, and once more squeeze out all water. Chop it fine, and pass it through a wire sieve. Melt in a stewpan 2 oz. margarine, add the spinach, and stir it round, then season it with salt, cayenne, and $\frac{1}{4}$ teaspoonful of grated nutmeg. Pour in 1 gill thick cream



Spinach. Leaves of the round variety, the best summer spinach



Spinet of wood and ivory ornamented with jasper and other stones, made in Milan in 1677
By permission of the Director, Victoria & Albert Museum, South Kensington

higher. The sound is produced by means of a piece of leather or quill which is attached to an upright piece of wood called a jack, and plucks the string as it passes, when the further end of the balanced key is depressed by the finger. As it returns, a wooden tongue into which the striking-point is inserted allows the quill to repress the string without repeating the stroke, this tongue being kept in place by a string at the back.

Small pianos of the late 18th century were sometimes called spinets erroneously, as they possessed a hammer mechanism instead of the rising jack and pluck-point of the spinet. Dating from the 16th century, during the 17th the spinet was popular in England. It was usually set on a three-legged stand which gave it the appearance of a miniature grand piano. Any graduation of tone is impossible, as the spinet has but one string to each key. See Harpsichord, Piano.

SPINNING WHEEL: The Antique. Though first introduced into England about the 11th century, Dutch examples of spinning

wheels made in the late 17th and 18th centuries were copied in most European countries, and the spinsters of England, Scotland, Wales, and Ireland used wheels which in design were very similar to those of Flanders. What is still known as the Dutch wheel is collected assiduously by interested people, though the name is used to designate one of Irish manufacture.

The wheels employed in English cottages for the purpose of spinning for a living were frequently of elm, ash, or birch. The fly-wheel of these was heavier, and the turning of the spokes, spindles, and legs much coarser in detail than was the case in the walnut and mahogany spinning wheels of more expensive make. Round the distaff, which is seen on the left above the wheel in the illustration, is loosely wound the raw fibre. This is spun off by the spindle. The fly-wheel is driven by the treadle, which is also clearly shown.

A unique collection of spinning wheels is that of Mr. John Horner, of Belfast, where these old machines are housed in the Municipal Art Gallery and Museum. Various museums in Yorkshire, notably Hull, also possess examples showing local characteristics, and a few specimens are preserved in the Victoria and Albert Museum, South Kensington.

SPIRAEA. Both shrubs and herbaceous plants of decorative value in the garden are included in this group. Some of the shrubs are very handsome when in full bloom; they thrive in ordinary well tilled soil. The best are *Thunbergi*, arguta and canescens, which bear white flowers in spring and early summer, and grow 4 ft. or so high. *Lindleyana*, *Atchisoni* and discolor, which bear cone-like clusters of white or cream-coloured flowers in late summer and reach a height of 10 ft. or more; and *japonica*, *bumalda*, and *Anthony Waterer*, which have red flowers in July-August, and are from 2 ft. to 4 ft. high. Propagation is by cuttings or seeds.

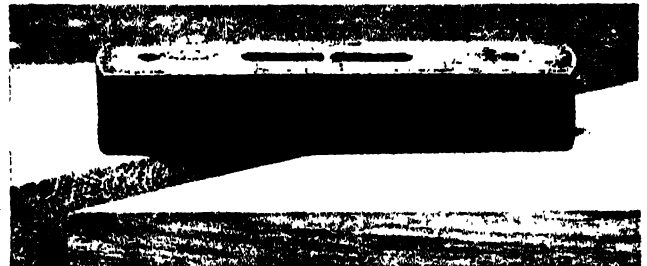
Of the hardy herbaceous spiraeas the noblest is *aruncus*, a vigorous plant 5 ft. or so high, with cream-white flower plumes in summer. *Filipendula* and *ulmaria* (the common meadow-sweet), with whitish flowers, and *palmata*, red, are other useful kinds. They are all good waterside plants, for they thrive best in moist soil. Propagation is by division in autumn and spring. *Spiraea japonica*, white, is a favourite plant for the greenhouse. Pron. *Spi-ree-a*.

SPIRIT LEVEL. A spirit level is an instrument for ascertaining the level or adjusting the level of an object in relation to the horizontal.

Essentially, the instrument comprises a wooden or metal frame containing a glass tube

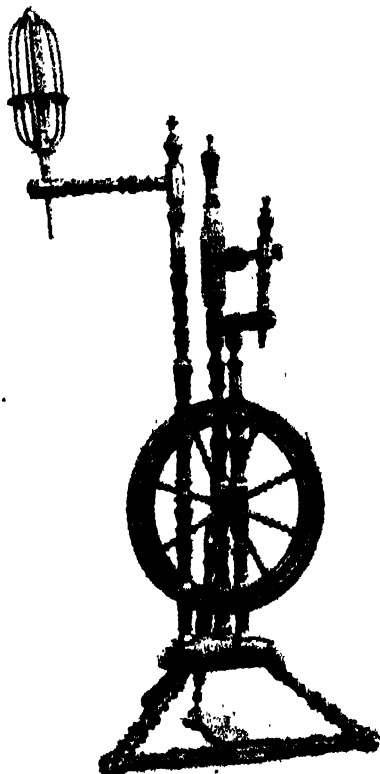
closed at each end and almost filled with liquid. A small air bubble, however, remains visible in it, and when the tube is in a horizontal position the bubble will always be exactly in the middle of the length of the tube, and at the top of it. A spirit level is calibrated and tested at the time of embedding the bubble tube in the frame, and thereafter should not be disturbed; otherwise the instrument may be thrown out of truth. To facilitate the reading and to increase the accuracy of the result, two lines are generally marked on the top of the tube in such a position that when the air bubble is exactly between them, the instrument is perfectly horizontal.

As an example of its use, suppose that a floor joist has to be set in a horizontal position. All that has to be done is to place the joist approximately in position, rest the spirit level upon it, and raise or lower the ends of the joist until the air bubble is exactly between the two lines marked on the tube. The joist will then be level. For ordinary purposes the regular carpenter's level shown in

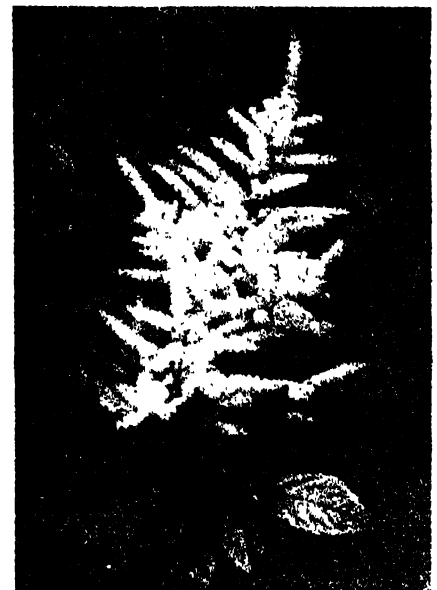


Spirit Level. Fig. 1 Testing level between two pieces of material

Fig. 1, will suffice. It is here seen in use to level two adjacent planks. These levels are available in various sizes, but one about 10 in. long is very convenient. Practically all levels with a wooden body, or frame, have a brass plate at the top and brass tips at the bottom, to strengthen the wood and increase the durability of the instrument. For carpentry or building purposes a longer level measuring about 24 in. will be found to be preferable. A useful type has two tubes, one at right angles to the other. The second



Spinning Wheel. Carved walnut spinning wheel; height with distaff, 4 ft. 4 in. 18th century
By permission of the Director, Victoria & Albert Museum, S. Kensington



Spiraea. Spray of *S. ariloides*, a July blooming plant with long feathery spikes of white flowers

tube is set near the end of the frame in a vertical position, so that the instrument can be used for plumbing uprights. When the bubble is in the middle of the tube it indicates that the object which is being tested is perfectly upright, as shown in Fig. 2. See Plumb Bob; Plumb Rule.

SPIRIT OF SALT.

This strong acid, known alternatively as hydrochloric acid, has valuable cleansing properties. It can be used to take stains from lavatory pans and washing basins, and when diluted with 20 times its volume of water, it removes rust marks from clothes without damaging the material. Thorough rinsing is essential, otherwise the acid may cause the fabric to rot. See Hydrochloric Acid.

SPIRITS.

General term for alcoholic liquors above a certain strength, which are obtained by distillation of fermented liquors. Such liquors include those used as drinks, e.g. whisky, brandy, gin, etc. The term also is applied to some liquids used for lighting, power, and other purposes, e.g. methylated spirit. In chemistry, it applies to various solutions, e.g. spirit of hartshorn, which is a solution of ammonia in water. See Alcohol; Brandy, etc.

Spitchcock. This is a method of cooking eels. They are salted, then fried in batter and breadcrumbed. See Eel.

Spitting. See Expectoration.

Splat. This term is used for the broad, flat upright portion of a chair back. See Chair.

SPLEENWORT. This is the common name of an extensive genus of ferns, hardly, greenhouse, and stove, botanically classified as Asplenium. Amongst hardy kinds the scale, maidenhair spleenwort, and wallru are suitable for growing on old walls, the lady fern in moist shady corners or borders, whilst others are useful for planting in the rock garden. The bird's nest fern is extensively grown for market purposes. See Fern.



Spleenwort fern on a wall



Spirit Level. Fig. 2. Use of spirit level in testing for the vertical

enough on each side of the fracture to afford good support and secure perfect rest.

When first aid is being rendered one person should hold the broken limb in an extended position while the other ties on the splint. First tie above the fracture, then below. If a leg is broken, tie both legs together after the splint has been applied. Handkerchiefs may be used for tying if bandages are not available. The splint should be tied on firmly, but not too tightly, lest the circulation of the blood be interfered with. Make the knots over the outer splint. See Bandage; First Aid.

SPLINTER: How to Extract. Thorns, needles, and splinters of wood which penetrate the skin should be removed as soon as possible, for if allowed to remain until inflammation begins, they become more firmly fixed in the swollen tissues; needles also sometimes wander far from their point of entry. If the splinter is visible, the opening through which it entered should be enlarged with a carefully sterilized needle or a sharp-pointed knife. The sterilization can be done by passing several times through a spirit lamp flame. The splinter should then be worked out by pressure with the tips of the fingers. If the splinter lies deeply, it is better to consult a doctor at once.

SPLIT BALUSTER. This is the name of a form of decoration used on simple styles of oak furniture especially towards the end of the 17th century. It consists of a spindle which, having been turned between two points on a lathe, was cut lengthways into

Splints are most commonly made of wood, but a great variety of other materials are also used, such as poroplastic, gutta percha, metal, celluloid, and cotton, linen, or flannel, stiffened with plaster of Paris, starch, or gum. Straw matting rolled up and cut to a suitable length forms an excellent splint in an emergency. Other materials with which, in an emergency, splints may be made are balsa, a broom-handle, a walking-stick or umbrella, a small straight branch of a tree, a few folded newspapers, a rifle, and a scabbard.

Padding must be done carefully, so that there shall be no lumps and that the splint shall fit evenly against the limb; extra padding should be placed over bony prominences, e.g. at the ankle. Probably the best material to use is sheep's wool, but cotton wool or tow serve very well. In emergency some old flannel or a number of handkerchiefs may be used. A splint should fit the limb accurately, for a broken thigh bone it should reach from the armpit to below the ankle. For other broken bones it should extend far

two or more parts and applied to ornament a frieze or border on a chest or dresser.

SPLIT PEAS: In Cookery. Split peas are amongst the cheapest and the most nutritious of vegetables. Their principal use is for soup-making, and they can be cooked in the same way as lentils. To be quite digestible they need long cooking after being soaked in cold water for 12 hours. See Lentil; Soup.

SPODE: The Ware. Josiah Spode was the founder of this firm of Staffordshire potters, which was one of the leading houses in the trade. After an apprenticeship to Whieldon and Josiah Wedgwood, Josiah Spode started a factory in 1770. His services rank next to Wedgwood's, and his black basalt and Jasper wares are in high esteem. He was the first to apply transfer-printing to the willow pattern, and his printed ware was often finished by hand with enamel colours. The improvements made by his son helped to establish the supremacy of English bone-porcelain and opaque china.

Spode porcelain is a translucent paste with a soft glaze and good printing. Dinner services were at first made with a medium-blue decoration, set off by solidly gilded handles and rims. The production of old Japan patterns, and also of lustre ware, was in the front rank. The earliest mark was Spode, stamped in the paste or pencilled on the glaze. The name was afterwards placed within a scroll, or across a square seal with the words stone-china beneath. Partnership between the younger Spode and William Copeland led to the factory passing ultimately into the family of the latter. For a time the mark was Spode & Copeland, then Copeland & Garrett late Spode, and afterwards Copeland late Spode, a mark which still survives. The present factory continues to produce many of the old Spode designs because of their popularity, but the modern ware is always distinguishable by the mark. See China; Pottery.



Spode. Beaker painted in colours and decorated with gilding in imitation of Japanese Imari ware. By permission of the Director, Victoria & Albert Museum, S. Kensington

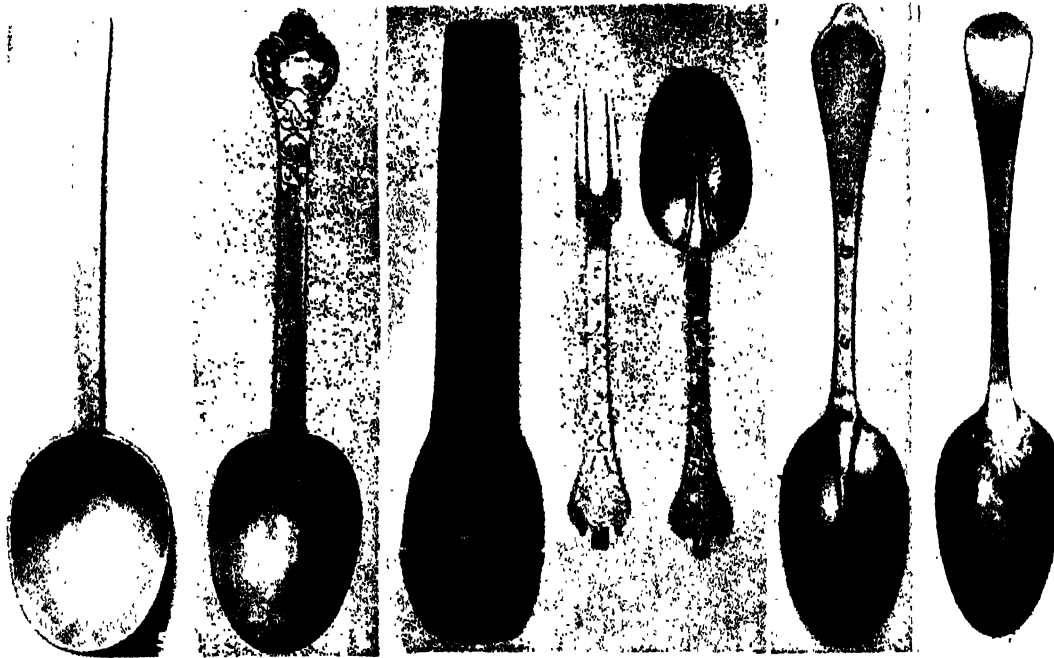
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SPOKESHAVE: How to Use. A spokeshave is a two-handed wood-working implement, consisting essentially of a stock or holder and a cast steel blade or cutter. Two typical examples are illustrated. The original and still extensively used spokeshave has a wooden stock. Into the middle portion is fitted a steel cutter having two tangs at right angles to the plane of the blade and located at each end of it.

The prongs of the spokeshave are pressed into holes cut in the wood, and as both hole and tangs are tapered, the blade holds firmly when tapped home. The other



Spokeshave. Right, pattern with wooden stock and tapered steel cutter. Left, type with malleable iron stock and a flat blade clamped to the stock



Spoon. Fig. 6. Puritan spoon with stump end, made in London, 1653. Fig. 7. Charles II spoon with ornate cleft handle and ovate-shaped bowl. Fig. 8. Silver spoon and fork with contemporary case: William and Mary period. Fig. 9. Early Queen Anne silver spoon. Fig. 10. Silver spoon, George II period, showing scroll instead of rat tail.

Courtesy of Spink & Son, Ltd.

favourite ornament at the end of reign of George II was the bead-edged handle, while a bit later many handles were engraved. After the accession of George III new patterns of spoons were introduced, but these differed only in the manner of ornament, the main design remaining the same, until the fiddle pattern appeared in the Victorian era.

Modern Spoons. To-day, unlike our ancestors, who were often content with one single spoon, which was carried about wherever they went, we have in common use a wealth of spoons for particular needs. A table service contains table-soup, dessert, tea, coffee, gravy, mustard, salt, pepper, oady, sugar, egg, salad, fruit, orange and ice-cream spoons.

The orange or grape fruit spoon illustrated in Fig. 10 shows the bowl conveniently shaped and the handle of conventional Old English pattern, as seen in Fig. 9. Designs for spoons and forks are usually based on the old patterns. Bend or reeded edges are seen on some handles, on others ornamentation takes the form of shells and fluting. Plainest Puritan designs are liked, and the fig-shaped and ovate bowls are reproduced in modern soup spoons, and in fruit and salad service spoons with flat-shaped handles.

The knob ends are often adapted to coffee spoons and to jam spoons. Salt spoons and mustard spoons usually match in style the containers they accompany. Egg spoons may be attached to a silver or plated stand or be bought separately to match the tea and other service spoons in use. Silver or plated ladies for sauce or soup, generally match the table-spoons. Very ornamental spoons are seldom used, but fruit servers are designed in which there is a decorative connexion between the plain silver handle and spoon bowl charac-

terized by fine workmanship and artistic form. Kitchen spoons include the ever-useful wooden ones in various sizes, perforated aluminium spoons for lifting eggs, etc., from boiling water sets of attached measuring spoons, of five different sizes, and tea-spoon intusers for making single cups of tea.

SPORE. This is the name given to those cells or bodies which are found on the backs of fern fronds and other flowerless plants and by means of which propagation is effected. The spores are gathered when ripe by shaking the fronds over a sheet of paper; they are sown in flower pots or pans of sterilized soil in a propagating case under glass and kept moist and shaded.

Spot: On the Skin. See Blackhead, Pimple, Rash, Skin.

SPOT-LIGHT In many modern professional portraits attractive and artistic results are obtained by use of a spot-light, an arrangement by which a beam of light, natural or artificial, is projected on to a face or profile or other part of the sitter, in addition to the ordinary illumination. By this means striking high lights are obtained, or parts which would be without detail in the photograph are given pleasing tone and balance.

In taking portrait photographs by natural light spot-lighting effects can be obtained in a room lighted by two windows especially if a bay window is available. One arrangement is shown in Fig. 1. Ordinary lighting is given by window A and the reflector. Spot lighting from above, or top-lighting, is given by window B, all but the top part about 12 in. or 18 in. square being blocked up. This will give a soft and not too obvious lighting of the face from above. Other arrangements can be

tried; these include leaving the centre of the blocked window open and moving sitter and reflector about. An arrangement which may be tried in an ordinary square room with two windows is shown in Fig. 2. This also will afford basis for experiment which may conveniently be carried out on an inanimate object.

A more convenient and adaptable method of spot-lighting such as is used on a large scale by professional portrait photographers, is the lantern form of light (Fig. 3) for use with electric lamps. It is fitted with a condenser lens mounted on a spring bracket which enables the light to be directed at any angle. The lamp-holder is adjustable to permit focussing with the condenser, and the light is controlled by means of a movable diffusing screen, and also a blue

filter, used separately or together. The light must not be placed too near the sitter. Experiment will show the best positions for the light and the exposure to be given. As a basis the amateur should try the spot-light about 6 ft. or 7 ft. from the sitter. The lamp is also useful in getting effects with daylight portraits, in addition to or in place of a reflector. See Portraiture.

SPOTTED FEVER. This is the popular name of cerebro-spinal meningitis, an inflammation of the covering membranes of the brain and spinal cord caused by a germ. These germs invade the throat in the first place, and are often found in the throats of people who have had the disease and also of others who do not themselves suffer from it.

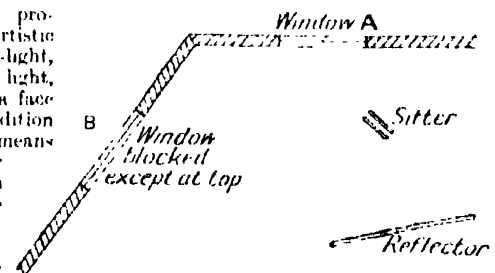


Fig. 1

Spot-light. Fig. 1. Arrangement in a room in which the spot-light is given by the window B.

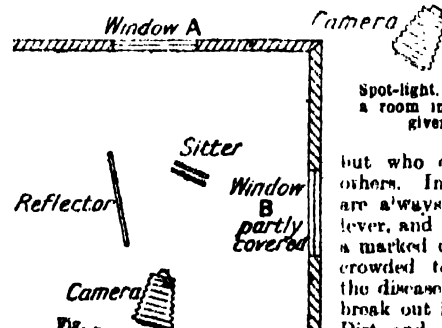
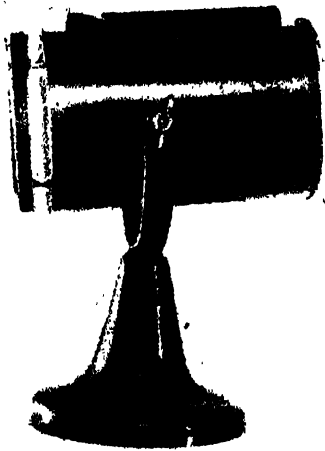


Fig. 2. Arrangement in a square room, with one of the windows partly covered.

but who can communicate it to others. In any community there are always "carriers" of spotted fever, and this danger increases in a marked degree when people are crowded together. Epidemics of the disease are therefore liable to break out in barracks, camps, etc. Dirt and bad sanitation play a contributory part.

Children are most frequently affected. Severe headache and



Spot-light. Fig. 3 Spot-light connected up and alight, ready for making an exposure. See page 1180
Courtesy of E. J. Thompson, Ltd.

vomiting, followed by a painful rigidity of the muscles at the back of the neck, are early symptoms. The doctor should be called at once. This is a notifiable disease and the patient must be isolated. Those who have been in close contact with the patient should use antiseptic gargles.

SPOTTING OF Negatives. Negatives frequently require spotting because of the presence of small holes in the film, called pinholes, due to dust on the plate before exposure or somewhat larger holes due to bubbles of air adhering to the plate during development. These holes are transparent, and therefore print black. They are most noticeable in the high lights, i.e. the dense parts of the negative, and may spoil the appearance of the print or the enlargement.

Prevention is, of course, the best remedy and will be achieved by taking great care to keep the interior of both camera and dark slides free from dust. Do not attempt to brush off possible dust with a camel-hair brush from the negative prior to development. In a dry atmosphere the brushing will slightly electrify the film of the negative, and attract much more dust than it removes. Glass negatives may be sharply tapped on the back with the thumbnail or the edge tapped on the table.

When pinholes appear they must be filled by spotting with Indian ink or other pigment. The secrets of neat spotting are to use the pigment nearly dry and not to attempt to work it on the film. One touch in the right place is all that is required. More will only spoil the result. Spotting is a simple and effective process if a little care is taken. Lamp black or ivory black mixed with water containing a little gum arabic or Indian ink, may be employed. Use a fine brush, preferably a No. 1 camel hair. Give it a good point by twisting on paper or between the lips, and take a very small quantity of pigment, mixed with sufficient water to make it of the consistency of cream.

Try the brush on paper, twirling it as when giving it a point until it hardly seems to mark. Then immediately touch the pinhole once, making a fine dot, and leave it. If the hole is a large one, a series of dots may be required, but they must not be allowed to run into one another. Allow the first to dry, if necessary, before making another. By this means, if care is used, spots in the prints will be entirely avoided, and with a little practice it will be found that a number of pinholes in a negative can quickly be spotted out. When a negative which is to be enlarged contains a number of very small pinholes, it

will be found that by throwing the negative slightly out of focus the holes will be practically unnoticeable in the enlargement without reducing its quality.

To spot prints, a pigment or water colour to match the colour of the print is chosen, mixed with gum water, and spotting carried out as for negatives. Large black spots may be removed with a touch of Farmer's bleacher, as used for intensifying (potassium ferricyanide with plain hypo). A spot of the bleacher is applied with a camel-hair brush, left for a minute or two to set, and then sponged off. The resulting white spot is touched with pigment to match. See Negative.

SPRAIN. Whenever a joint is wrenched the bones may be displaced or fractured but when the injury stops short of this and consists merely of stretching or tearing of the ligaments and tendons it is called a sprain. Even this may do damage, cause pain, and hamper movements of the joint.

Bleeding takes place from torn blood vessels, and this is quickly followed by inflammatory reaction in the injured tissues. These things combined lead to more or less swelling and discoloration, and when in the course of a few days the shed blood breaks down, the familiar changes of colour from red or black to green and yellow occur.

Cold compresses should be applied at once. They relieve pain and help to diminish bleeding. Later hot applications may be used for the pain and to promote absorption. Rest at first is necessary, and splints may be used to this end, but early massage and passive movements are necessary to prevent stiffness. See Ankle, Bandage, First Aid, Joint.

SPRAT: How to Cook. The sprat is seasonable from November to March, and should be eaten very fresh. After being cleaned it should be rubbed in a cloth to remove the scales. The condition of this fish is easily ascertained by the appearance of the eyes; if these are bright it is fresh, also the skin of the fish should have a silvery look when washed. Dried sprats may be bought in bundles. As far as possible of the dried skin should be removed by placing the fish in boiling water and then wiping them dry on a clean cloth. The sprats are then heated in the oven in a greased baking tin.

After being cleaned and rubbed sprats may be dressed by being dipped in seasoned flour and fried in boiling fat, a frying basket being used to keep the fish together. The fat should be smoking hot or the fish will be sodden. If no frying basket is at hand the sprats must be fried in a frying pan, using plenty of fat. The fat cannot be used again for anything except fish. Another method is to dip the fish in seasoned flour and egg and crumb them using very fine white breadcrumbs.

Pickled Sprats. Sprats may be pickled to keep. Clean the fish and boil them, just covered with water. When cooked drain off the liquor and pack them tightly but evenly in jars. Fill up the jars with equal quantities of strained fish liquor and vinegar. Set them by for a few days, and if the vinegar has become reduced fill up the jars. Tie down closely.

Sprats au Gratin. Prepare 2 lb. sprats, and arrange them in a well-greased fireproof dish. Season them with salt and cayenne pepper, and pour

over them the following mixture: $\frac{1}{2}$ lb. mushrooms, prepared, cut in strips and blanched in $1\frac{1}{2}$ gills stock, 2 wineglasses sherry or white burgundy (if desired), 2 peeled and chopped shallots, and a grate of nutmeg. Pour this, including the liquor in which the mushrooms were blanched, over the fish, then place at intervals about 1 oz. butter or margarine in small pieces. Scatter over 1 tablespoonful chopped parsley, and coat with browned breadcrumbs. Bake for about 20 min.

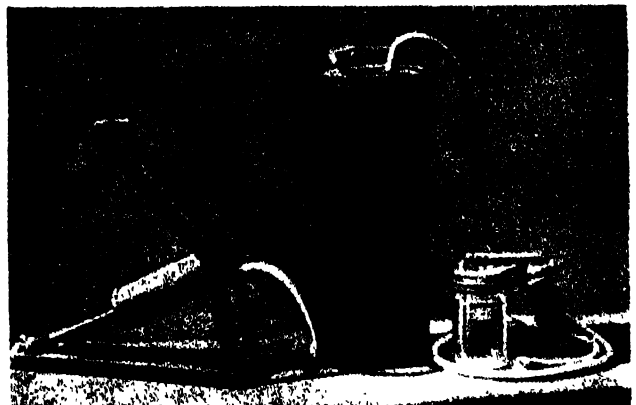
SPRAY: Medical Uses. In affections of the nose and throat the use of a spray is often preferable to other methods of applying medicaments. The liquid is converted into a fine cloud by means of a rubber ball which when compressed, sends a current of air across the mouth of a tube that dips into the liquid. The spray is safer than the nasal douche for a cold in the head, and more effective than gargles for a sore throat. Cocaine, menthol, carbolic acid, iodine and other sedative and antiseptic drugs are used, and the vehicle may be water or liquid paraffin. See Douche.

SPRAYER. For domestic purposes a sprayer can be used for scent and for fixing charcoal, pencil, and other drawing by covering them with a finely distributed film of varnish. Larger forms of the same appliance are employed for spreading whitewash, distemper, and paint, and in the garden disinfectant and insecticide are sprayed on potatoes and on fruit and rose trees. The principle is quite simple and consists in passing a current of air over the top of a tube which is immersed in a liquid.

The simplest form of sprayer consists of two lengths of glass tube fastened together with a hinged clip, so that they can be set at right angles. One tube passes through a cork and reaches almost to the bottom of a bottle containing the liquid to be atomized. When air is blown through the horizontal tube the liquid is drawn up from the bottle and projected as a fine spray. The essential feature of the appliance is in the relative positions of the ends of the tubes, for the end of the horizontal or air tube must be so put that it directs the air across the top of the liquid tube.

In the scent spray for the dressing table the air is supplied either by a rubber ball or a piston, the former producing a continuous spray.

The common pump



Sprayer. Portable paint spraying outfit suitable for home use. The pistol is shown enlarged in the upper photograph
Courtesy of Richard Melhuish, Ltd.

sprayer for insecticides has an action similar to that of the tubular sprayer described above. It consists of an air tube in the form of a pump, and similar in action to a syringe. A nozzle at the end is directly over the liquid tube, which is attached to and fits in a receptacle holding the liquid, this container being filled through an opening covered by a screw cap. This type is used also for spraying rose trees and fruit bushes.

The spraying of distemper, paints, cellulose finishes, etc., requires a more powerful air pressure. In commercial work a power driven air compressor is used, but a substitute for home use is available in the form of a foot pump in combination with an air reservoir. A portable sprayer is shown on page 1181. Machines suitable for garden use are described in the succeeding article.

SPRAYING In the Garden. Various liquid mixtures which are administered by spraying are widely used for destroying insect and fungus pests on fruit trees, rose trees, and other flowers, as well as on certain vegetables; for instance potatoes. Spraying is most effective in dry weather. If it is followed quickly by heavy rain it must be repeated as soon as the weather clears. Early morning and evening are the best times of the day for spraying.

A hand syringe with a spraying nozzle is usually sufficient for treating potato plants, small fruit trees, rose trees and flowers, but for large trees and stretches of potatoes a mechanical sprayer is advisable.

Spraying Machine. Where there are a good many trees concerned a machine sprayer is used. One of the best is known as the knapsack, being so called because it is carried on the back. This is suitable for spraying all kinds of fruit trees, as well as potatoes and other vegetables.

In these machines the container which holds about 3½ gallons of the spray is usually made of plain or tinned copper. The former is less expensive, but it cannot be used for a lime sulphur wash, for which either a tinned copper one must be used, or one with a container made of an alloy that is chemically resistant. Fitted to the container is a short length of hose, and attached to this is a brass lance about 3 ft. long, the nozzle being fitted to the end of the lance. For spraying large trees a lance 5 or 6 ft. long, can, if necessary, be fitted. All spraying machines are fitted with strainers. When it is necessary to spray an orchard of large standard trees, a type of small wheel mounted machine is recommended.

Winter Spraying. For spraying fruit trees in winter the fat-oil washes are recommended; they not only cleanse the trees of moss, lichen and other impurities, but help to destroy hibernating pest among the branches. Lime sulphur, nicotine and Bordeaux mixture are commonly used in early spring before the blossom buds open, and again at summer strength later on if necessary. Arsenate of lead paste is used on, if sprayed on the trees as soon as the blossom has fallen, poisons the food of caterpillars. During the summer months one of the concentrated insecticides sold under various patent names will keep down aphids and other common pests. See Apple, Bordeaux Mixture, Fruit, Insecticide, Potato, etc.

SPRIG In Lace. In lacemaking this word is first to one of the separate pieces of lace stretched on a ground in appliqué lace. Material embroidered with sprigs, or which has sprigs in the pattern, is known as sprig embroidery or sprig muslin. See Lace.

Spring. See Door, Lock.

SPRING In the Garden. For the amateur gardener spring is the most delightful season of all, particularly in the open garden, and it is also a busy time. The results of hard

work during the dark, cold, wet and frosty days show themselves by the arrival at perfection of many beautiful subjects, particularly flowering bulbs. First of all come the snowdrops, which are closely followed by crocuses, scillas, anemones, hyacinths, narcissi, daffodils, and tulips. Later on flowering cherries and almonds put forth their beautiful pink and white blossom, fresh young buds and foliage begin to appear upon trees, shrubs and perennial plants.

Strenuous work must be done out of doors in order to obtain the best results later on. This necessitates care in the sowing of seeds of hardy annual flowers, which, in small gardens may be done safely in between the clumps of spring flowering bulbs already in bloom and the groups of established perennial plants which begin to indicate their presence for the season. Many questions of pruning, propagating, dividing, and other technicalities arise at this time of the year.

As the astronomical period of spring is from March 21 to June 21, information regarding the constructional part of gardening work will be best derived from the tabulated information given in this work under the headings of the different months. See April; Autumn; June; March; May; Summer.

SPRING CABBAGE. This is a valuable vegetable which supplies produce in spring and early summer. Seeds are sown on a reserve bed during the third week in July and early in August in southern districts, and early in July in northern countries. In September the plants are put out where they are to remain at 15 to 18 in. apart. Some of the best varieties of spring cabbage are Harbinger, April, Ellam's Early, Flower of Spring, Mon's No. 1, and Emperor.

SPRING-CLEANING. The housewife who starts to spring-clean with a definite plan of action generally manages to renovate the home with the least possible amount of fuss or disturbance of its other inmates, and with the best and most economically accomplished results. The plan includes arrangements for essential repairs outside (in the case of the owner's house) and inside, also getting rid of rubbish, storing away winter things, making at home anything in the way of new covers, lampshades, curtains or cushions that are required, or getting them made, and sending away carpets and other soft furnishings which need professional cleaning or dyeing.

It is wise to make out the plan a good fortnight before the cleaning begins. Obviously any external repairs needed to roof, gutters, windows, etc., should be done first; then when the carpets are up any repairs to gas fires or other installations which may be required indoors. Should any room or rooms have to be redecorated it is advisable to remove everything portable, and have that work finished before proceeding with the other general spring cleaning. In the meantime small things can be attended to: cupboards can be thoroughly turned out, winter goods protected from moth by cedar chips, naphtha or lavender, stored away safely wrapped in newspapers, and rubbish disposed of. China can be mended and also rugs and carpets which need fresh binding or darning with rug wool. Any odd jobs of carpentry or putting up shelves, etc., should be done before cleaning starts. Mattresses or pillows which require re-making should be sent away, and stock can be taken of the linen, glass, china and kitchen utensils.

Method of Procedure. In the case of a house it is best to start from the top downwards. The sweep should be engaged to clean in turn any chimneys in rooms where there have been coal fires. Having decided the rotation of cleaning, prepare a room for the sweep the day beforehand by removing all

hangings, etc., and covering the rest of the furnishings with dust sheets and newspapers (unless the sweep uses the vacuum method).

An electric vacuum cleaner is not only useful for cleaning ceiling, frieze, picture rail, and walls, but also for mattresses, stuffed chairs, divans, settees, and soft furnishings generally. Once the sweep has finished, the special attachment to the vacuum cleaner should be used for ceiling and walls, or, failing this aid, a long handled soft ceiling broom. After this the floor is dealt with, scrubbed or washed over with soda water and repolished, if parquet, or if of stained boards which are worn, restained with equal quantities of Brunswick black and turpentine, giving as many coats as are required, leaving them to dry in turn and then treating with floor polish.

When linoleum, rubber or cork carpet is the floor covering, use a little disinfectant in hot, soapy water with a clean floor cloth, afterwards dry thoroughly and wax polish. Japanese or fibre matting can be scrubbed, using a little soap and water, and working the way of the weave. The matting should be dried with a soft cloth immediately. Paintwork is best lightly treated with a tepid solution of borax and water, dried and polished with a soft rag on which a few drops of paraffin are sprinkled. Windows should be thoroughly cleaned and blinds, if any, scrubbed with a brush wrung out so that it is merely damp with soapy water and afterwards the blinds must be well dried. All furniture and fittings are next cleaned. Polished wood that requires particular attention should be washed in tepid vinegar and water and then rubbed over thoroughly with linseed oil and left for a few days; after this it should be well polished with furniture cream. Other furniture should have the woodwork washed over with a damp cloth and polished, and any upholstery well brushed or treated with the correct vacuum cleaner attachment.

Cleaning Fireplace and Mantelpiece

All pictures and mirrors should be cleaned, all drawers and cupboard shelves washed over with a damp cloth wrung out of hot water with a little disinfectant added to it, and, when dry, relined with clean paper. Brick fireplaces, which should be rubbed down weekly with warm water to which a little paraffin has been added, may be further cleaned with a preparation sold for cleansing unglazed bricks. White marble curbs and mantelpieces which are stained should be rubbed with half a lemon dipped in salt. Leave the application on for a few minutes, wash off and dry the marble thoroughly.

China and glass, ornamental or useful, should be washed in soapy water with a little ammonia in it, using a hoghair paint brush for finely modelled pieces and for getting the dirt out of crevices. Fittings of brass, copper, etc., and ornamental pieces should be cleaned and the opportunity taken to apply a transparent lacquer to any suitable pieces, which will save further cleaning for a considerable time. Piano keys and other ivory can be best treated with a paste made from sal volatile and olive oil, rubbing it on with a wash leather and leaving till dry, when the paste is polished off with a clean soft cloth. All books should be thoroughly dusted and old papers and magazines discarded if useless. See Brush; Carpets; Carpet Sweeper; Clothes Moth; Labour Saving; Paint; Polishing; Vacuum Cleaner.

SPRINGER The Dog. The breed of sporting spaniel known as the English springer is a very symmetrical dog, weighing on the average from 40 to 50 lb. He is possessed of a long head, square muzzle, longish flat coat, long ears, straight front legs, good strong feet, and a general look of activity.



Springer. Champion of this breed of spaniel

The colours are various. Among sporting dogs the springer's extra size gives him greater pace than the cocker, and he is able to retrieve a hare. See Dog.

Spring Mattress. See Divan; Mattress.

SPRING ONION. To prepare these for table, wash them well in cold salted water, so as to draw out any insects from the leaves, cut off the roots, and trim the green tops. The outside leaves, if withered, may be peeled off. Serve the onions either whole with salt, or cut them up and add them to a mixed salad.

Spring onions are sold in small bunches. The leaves should be upright, any tendency to droop being an indication that the onions are not fresh. See Onion; Salad.

SPRINKLER: For Clothes. Any vessel which has a perforated top that will serve as a sprinkler may be used to damp clothes before they are ironed. The large enamelled tins, with handle and detachable tops, sometimes used as flour dredgers, make good sprinklers, and enable the damping process to be done more evenly and thoroughly than would otherwise be possible. See Ironing.

SPROCKET: The Wheel. A toothed wheel of any diameter suitably designed for chain drive as distinct from gear drive is a sprocket. The shape, width, and pitch of the teeth will vary in accordance with the pitch and width of the chain to be used.

In its true form the sprocket wheel is always employed for pedal cycle work in conjunction with the block or roller type of chain, the roller chain being the most popular. A sprocket used with the silent chain is in appearance identical with the ordinary pinion, the teeth being much the same in shape. This pattern is always employed where chain drive is incorporated in the design of a motor vehicle. See Bicycle; Internal Combustion Engine; Motor Cycle.

SPRUCE: The Tree. This is the common name of a group of conifers among which are valuable timber and ornamental trees. Deal is the wood of the common spruce or Christmas tree (*Picea excelsa*). The blue spruce (*Picea pungens glauca*) is a beautiful lawn tree, and others of decorative value are the Himalayan spruce (*Picea morinda*); Engelmanni, the Serbian spruce (*Picea omorica*), and the Sitka spruce (*Picea sitchensis*); the last-named is an excellent tree for wet land. Propagation is by seeds.

Uses of the Timber. Spruce or white deal is one of the cheapest and commonest woods, imported into Great Britain from N. Europe and N. America. It has a white, clean appearance, with distinct annual rings and with numerous small hard knots, the latter making it rather difficult to work, as they dull the cutting tools, otherwise the wood is fairly soft. It is light, elastic and resonant, the

latter quality making it a suitable wood for sounding-boards and for violins.

As a tree spruce is tall and straight, yielding poles which are suitable for masts, spars, scaffold and telegraph poles, and for ladders when split. Builder's planks and temporary constructions are generally of spruce, and it is used for piles, packing cases, and similar rough work, and also for making paper pulp.

Its cheapness and clean appearance are reasons why spruce is employed for flooring, matchboarding, kitchen dressers and tables, and much other interior joinery. It is used also in boat-building and for oars. The Christmas tree is a small spruce. See Wood.

SPRUCE BEER. This is a beer flavoured with a decoction of the young shoots of the spruce fir. To make it, dissolve 4 lb. treacle in 2 gallons water by heating in a large pan, then strain the liquor into a cask, and add to it 2 gallons cold water and about 2 table-spoonfuls spruce essence.

Let the whole stand until it is just lukewarm, and then stir in $\frac{1}{2}$ gill fresh yeast. Place the cask in a warm place, and when fermentation ceases bung it closely and leave it until the following day, when its contents may be bottled. Spruce beer made in this way is ready for drinking in a week's time. Essence of spruce is made by boiling the tops of the black spruce in water, then taking them out and boiling the water again so as to concentrate the decoction.

SPUD: For the Garden. This is a long-handled tool with a sharp, straight, narrow blade which is used for digging out hard-rooted weeds such as thistles or burdock. Smaller types are convenient for eradicating lesser weeds on lawns paths and between cultivated crops. See Spade; Weeds.

SPUR: For Horses. Nickel or electroplated spurs are those in general use. Each spur consists of the branches for the heel, neck, and rowel, blunt or sharp, with a strap to go below the boot and one to fasten around the instep, with a leather pad to keep it in position on the boot and to prevent undue pressure on the foot. Spurs are used for



Spur Valerian. Rose-red flowers of a hardy plant for a sunny or shady border. See article above

enlivening a jaded horse or as an aid to guiding the animal in crowded thoroughfares, or to force a horse up to its bit when necessary. When applied with discrimination they are considered essential for breaking and making good hacks and hunters. After use the straps should be removed and the leathers carefully sponged. See Horse; Riding.

SPURGE. This is a large genus or group of plants but few of them are of much value to the gardener. The botanical name is *Euphorbia* (q.v.).

SPUR VALERIAN. This is a useful plant (*Centranthus ruber*), suitable for sunny or shady borders, walls and the wild garden. It grows about 2 ft. high and bears rose-red flowers in summer. It spreads rapidly by means of self sown seeds. The variety coccineus is a better colour and the white variety is attractive. See illus. below.

Sputum. See Cough; Expectoration.

SQUAB PIE. To make, fill a pie-dish with alternate layers of fairly thin pieces of uncooked mutton, sliced onions, and sliced apples. Over each layer of meat and onions sprinkle salt and pepper and a pinch of chopped herbs, over the apple a little white sugar. If the mutton is very lean a few small pieces of bacon fat should be added. When the dish is full pour over it about $\frac{1}{2}$ gill water, then cover it with a good thick short crust and bake the pie slowly. It should be served hot. See Pastry.

SQUARE MEASURE. This is employed for measuring land, walls, floors, and surfaces of all kinds, being essential in all building operations. It is as follows:

144 square inches	= 1 square foot
9 square feet	= 1 square yard
30 $\frac{1}{2}$ square yards	= 1 square rod, pole, or perch
40 square rods	= 1 rood
4 roods	= 1 acre
640 acres	= 1 square mile

See Architecture; Bungalow; Measurement; Rule, &c.

SQUEEGEE. The simplest form of squeegee is the flat type, consisting of a strip of thick india-rubber mounted in a wooden holder. When passed over a wet sheet it drives out excess of water from both upper and under surfaces of the sheet.

Large flat squeegees mounted on broom handles are much more effective than a broom or mop for sweeping water off concrete or cement floors and paved courtyards.

Squill: The Plant. Squill is an old-fashioned name for the spring-flowering scillas (q.v.). See Scilla.

SQUINT: How to Treat. Strabismus or squinting is mostly due to errors of refraction, but may also be the result of paralysis of a muscle of the eye. Squinting from long sight or hypermetropia may appear at a very early age. When a child makes a strong effort to bring near objects to a focus there is undue contraction of the muscle, and a squint is produced. In short-sighted squint there is weakness in turning the eye. An inward squint is commonly due to paralysis of the muscle, which turns the eye outward.

For the squint caused by paralysis the treatment will vary according to the disease on which the paralysis depends. In the forms of squint arising from errors of refraction, the child should be at once taken to an oculist, who will prescribe suitable glasses. If this is done in time the squint may be cured in many cases. But if one eye is weaker than the other, efforts must be made to strengthen it. The usual measure is to cover the stronger eye with a shade, so that the weaker one may be strengthened by exercise. The same object is obtained if some atropine ointment is applied daily to the better eye. The treatment should be given a full trial for at least a year. See Eye; Sight; Spectacles.

SQUIRREL: The Fur. Squirrel fur is grey in colour, the clear pale shades being most valued for making up into coats and wraps. It dyes well and the darker skins can be treated to imitate Kolinsky or sable. Squirrel is also dyed to match mole and flat brown furs as a trimming. Unfortunately, it is not a durable fur. *See Fur.*

SQUIRREL PAINT BRUSH. To a great extent brushes of squirrel hair have taken the place of the camel hair brush for oil and water colour painting. They are made in a variety of sizes and are obtainable at artist's colour shops.

SQUIRREL'S FOOT FERN. This is the common name of *Davallia*, a greenhouse fern. Its rhizomes are often trained round objects of various shapes and sold as fern balls. The most popular kind are the squirrel's foot fern (*bullata*) and the hare's foot fern (*canariensis*). *Davallias* are well suited to cultivation in suspended baskets. They like moist, warm, shady conditions. A suitable potting compost is two parts of fibrous loam with one part each of sand, peat, and charcoal, potting being performed in spring.

SQUIRREL TAIL GRASS. The ornamental grass known as maned barley or squirrel tail grass belongs to the genus *Hordium*, and the only noteworthy species is *H. jubatum*. This is an annual growing about 2 ft. high, the bearded awns of which form a kind of mane. It may be sown in spring or autumn and will thrive in any open space.

SQUIRTING CUCUMBER. This is a curious half-hardy annual climbing plant with oblong, cylindrical fruit somewhat resembling small cucumbers. When ripe these fruits open and discharge their pollen. They should be grown in a heated glasshouse in a mixture of loam and leaf mould and may be trained up the sides of a sunny greenhouse and on to the roof. Potting up must be done in early spring in large pots.

Propagation is by seeds sown in pots early in the year, in a temperature of from 60° to 70°. The flowers of the squirting cucumber are yellow in colour. The botanical name of the family is *Menispermaceae*, while other popular names are balsam apple and apple of Jerusalem.

STABLE. In building a stable the points that must be principally borne in mind are that the horses should have plenty of light, plenty of air and that the floor upon which they stand should be dry and well drained. A stable may be built of any material convenient, either stone, cement, bricks, or timber.

The stable walls should be 8 or 9 ft. high, so as to give plenty of head room, and the floor

should be raised at least 9 in. above the surrounding soil. The common practice of building the hay loft above the stable is not a good one. It leads to bad ventilation and to dust and dirt in the stable beneath, while at the same time the ammoniacal vapours rising from the stable do not improve the hay.

Ventilation should be provided in the ridge of the roof and also in the walls, but the ventilators in the walls must be set above the height of the horse or horses' heads. If set lower, draughts will be caused and the horse will suffer. Stalls are frequently made too narrow; 6 ft. is the minimum width to be allowed for an ordinary horse. The slope of the floor should not exceed 1 in 50. There is nothing worse for a horse than to be compelled to stand on a steep slope with the greater part of its weight upon its hind legs.

Points about the Floor

The floor of the stall or loose box is generally made of cement concrete slabs, which are roughened so as to give firm standing. Blue bricks grouted in cement make an excellent floor, but it is more costly than cement. Stone setts can be used if laid on cement and grouted with cement mortar. Cement alone will not stand the hoofs of heavy horses and asphalt is too slippery, while wood absorbs moisture and cannot be kept clean. Good drainage is all important, for if a horse is allowed to stand on foul and wet bedding its feet will certainly suffer. Under-floor drains, like stone causewayed floors, are now out of date, the drainage to-day being usually carried out of the stall.

The modern hay rack is usually of iron and set at a much lower level than the old wooden rack. The feeding trough is either of cast iron or of fire clay, and is set not more than 3 ft. from the floor of the stall. Water is usually provided in the stall, the water pot being set at a little distance from the manger, and provided with a supply pipe and tap. It should be of a shape easily kept clean, and water should not be left in it. The woodwork of the stall should be clean dressed and varnished, and all ironwork painted three coats.

The stall should be provided with suitable windows. It is cruel as well as foolish to keep a horse in a dark stable, and particularly when it is opposite a blank wall. The windows should be of the sash variety, and made to open and shut. The best for stable purposes are made with iron frames. A window in the wall must be protected with iron bars on the inside. It is well to remember that an ordinary 15-hand horse can reach up to a height of quite 7 ft.

The harness room is usually part of the same building as the stable, and is provided with fittings for holding harness and saddlery. These, as a rule, are made of iron, but wood is a preferable material. The harness room is provided with some method of heating it, either a stove or an open fireplace, for although there is no necessity to warm the stable itself, it is essential to have means at hand for drying wet harness, and for making hot gruel or bran mash for the horses.

Shelves are required for holding harness soap, oil, and polishes, and a few veterinary medicines can be kept

in a small cupboard. In a small establishment the corn chests may be kept in the harness room. These are made of galvanized iron, and they are usually separated into two or more compartments, to hold oats, beans, maize, bran, etc.

It is necessary that water be laid on to the stable, and the tap must be one that will take a hose pipe. The manure pit should in no circumstances adjoin the stable. All manure should be removed each day to a pit in the garden, or at some convenient distance from the house and stable. *See Drainage; Harness; Horse; Manure; Root*

STAFFORDSHIRE CHINAWARE. The qualities which characterize this china, both in its useful and in its ornamental forms, are durability, whiteness, and translucency. It has had as much to do as the coarsest pottery and stoneware with spreading the renown of the Five Towns—Burslem, Tunstall, Hanley, Longton, and Stoke, whose activity was greatly enhanced by their amalgamation into the county borough of Stoke-upon-Trent, which possesses five great public museums. Among outstanding names are Spode, Davenport, Minton, Neak, Mason, Ridgway of Cauldon Place, Adams, Copeland, Green, and Brownfield.

Collectors of old china regard the immature and uneven productions of William Little, of Longton Hall, for a few years after the middle of the 18th century, as the beginning of Staffordshire china. The mark was made up of two L's crossed, and examples are now rare. But it was Josiah Wedgwood who introduced into the manufacture of fine earthenware those new methods of potting, firing, and decoration which revolutionized the industry.

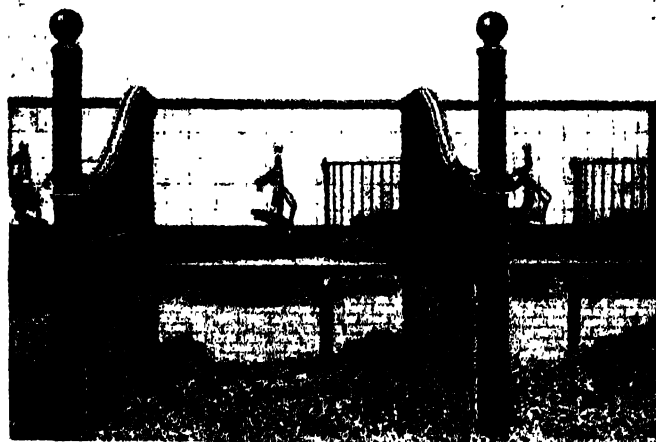
Somewhere about the year 1800, Josiah Spode, the younger, adopted at Stoke-upon-Trent a mixture of china clay, felspathic rock, and bone ash, with a lead glaze, which resulted in a true porcelain. His example was followed not only in his own neighbourhood, but ultimately also in the great rival factories found elsewhere.

The result was to abolish the old 18th century distinction between hard paste, as represented by Dresden, and soft paste, as wrought at Sevres, and virtually to establish a standard composition for English bone-china throughout the kingdom. As the proportion of bone-ash may be as much as $\frac{1}{3}$, the resulting body differs radically from that of the Chinese porcelain, and has become the chief model for modern china manufacture in all countries.

In the early years Spode and Davenport turned out tea and other services in old Japan patterns, sometimes on rose or celadon-green grounds, with gilt feet. Davenport also made at Longport vases and other pieces with raised floral ornaments enclosing delicate landscape panels.

After the mid-Victorian art revival, Mintons did some outstanding work, and the Crown Staffordshire Porcelain Co., Ltd., successfully rivalled the enamel tints used by Chinese potters in the famille verte, famille rose and powder-blue groups. Perhaps the highest achievements in this direction are the flambe glasses wrought by Bernard Moore. *See China; Davenport Ware; Minton Ware; Pottery; Spode; Wedgwood.*

STAG BEETLE. The visits of stag beetles to the garden on summer evenings often gives rise to unnecessary alarm. They are perfectly harmless, in spite of the formidable appearance presented by the antler-like development of the male beetle's jaws. These are neither offensive nor defensive in their function, being, in fact, mere ornaments. The smaller, inconspicuous jaws of the female are of a far more practical character; but they are used only for crushing soft shoots in order to suck up the sap. As the attack is made chiefly on oak trees, no appreciable harm is done. The grubs



Stable. Stalls in a model stable, showing tiled walls, conveniently placed hay racks and feeding troughs, and a general effect of light and cleanliness



Stag Beetle. Male and female of this harmless garden insect

spend the full period of their existence feeding in the decayed wood of old stumps, and are in no sense garden pests.

STAGE. When a stage is required for amateur theatricals or concert in house or garden, it may either be hired from an entertainment caterer with its accessories of proscenium, curtains, and lighting arrangements, or else it can be made at home in a simple but satisfactory way.

Presuming that the performance is to be in the house, the size of the available room must be considered first, as the smallest stage requires a room not less than 14 ft. high, 20 ft. wide, and 30 ft. long. Of the last measurement 14 ft. is required for the depth of the stage and the remaining 16 ft. for the accommodation of the audience, who are too near the players unless 4 ft. be left between the stage and the first row of seats.

The bare stage floor measuring 20 ft. by 14 ft. seems a good size, but when the marginal space of 4 ft. has been allowed at each side, and at the back for standing room, exits, and entrances of the actors, the passing behind the scenes required during the performance and the necessary support for scenery by stage braces, the acting portion of the stage is reduced to a 12-ft. wide opening and a depth of 10 ft. Though workable, it will be seen that this size somewhat limits the scope of the productions. If the entertainment be given with screens or drapery as a background instead of scenery, the same amount of marginal space would not be required on the stage, and a smaller room could be used.

Making the Curtains. The curtains may be made of dark coloured Bolton sheeting, and should part and fall easily. A simple plan

come together in the middle, 6 ft. from the top.

A line is threaded through these rings and over a pulley at each top corner, which will draw the curtains up into a festoon. Weights should be sewn along the bottom hem. This method requires a person on either side to raise or lower the curtains.

Scenery and Lighting. Exterior scenes are usually formed by a back-cloth, wings, or side pieces, and borders of top pieces of trees or sky. Interior sets are, as a rule, made up of flats and ceiling borders. Flats are straight pieces fastened edge to edge by cleats and lines and held up by wood or iron braces.

Effective lighting for an amateur production requires neither expert skill nor elaborate equipment; success can be achieved by intelligent use of the existing house installation, supplemented by some medium-wattage lamps, and a few pieces of tinted glass or gelatine for colour effects. A most important point about lights is that they should focus audience's attention without casting shadows on the actors. Good make up can be ruined by badly positioned lights, and glaring footlights distract the onlooker from what is happening on the stage. When connecting up stage lights to a domestic supply, arrange a simple switchboard, with a switch for each individual light, or group of lights (such as the footlights), so that they are easily controlled out of view of the audience. Use good flex, not odds and ends, and bind all connections with insulating tape, to reduce risk of fire or shock. If there are several fixed lighting points in the room it is better to distribute the stage lights over them all. See *Amateur Theatricals*.

STAINS AND THE STAINING OF WOODWORK

Rules for the Application of this Decorative Finish

Useful both to the householder and the woodworker, this article deals not only with methods of staining but with the preparation of the varied surfaces so treated. See also Floor; Graining; Oak; Paint; Pokerwork; Varnish, etc.

The object of staining generally is purely decorative, but certain stains have preservative qualities and thus answer a double purpose. By the use of a stain interior woods may be made to resemble those of a finer quality, and hardwoods may be darkened to any shade for the purpose of enhancing their appearance.

While painting forms a completely new surface upon the wood, thus hiding the grain, a stain permeates into the grain, changing its colour without forming a fresh surface. There are many different varieties of stains, the chief difference being in the medium with which the colouring properties are mixed. This may be water, spirit, oil, wax, or varnish.

Wax stain is sold under a variety of names. It is applied with a brush, dries in a few hours, and results in a durable wax finish which can be polished with a brush. It is obtainable in a number of shades.

Another method of staining is by the use of chemicals such as permanganate of potash, ammonia, and bichromate of potash. There is another class of chemical stain, the use of which involves two processes, a priming and a colouring coat. The solution combines with the wood to form pigments which are fast, and the colour may take a couple of days to develop.

Stains may be either purchased ready made in liquid form, or obtained in the form of paste, powder and crystals. They are usually named according to the woods they represent, as light and dark oak, mahogany, walnut, and ebony, or in direct colours, as blue or green.

For outdoor work it is necessary to obtain stains which are weatherproof, as ordinary types are apt to fade quickly and develop a

is to sew rings on a tape running diagonally across each curtain on the side away from the audience. For a stage with a 12 ft. opening the rings would start from the upper right and left inner corners respectively, and be continued down to a point on the edge of the curtains, where they

come together in the middle, 6 ft. from the top. A line is threaded through these rings and over a pulley at each top corner, which will draw the curtains up into a festoon. Weights should be sewn along the bottom hem. This method requires a person on either side to raise or lower the curtains.

Where it is desired to stain existing woodwork, care should be taken to ensure its being clean and free from greasy marks, as these parts will be lighter than the remainder when the stain is applied, and will give a spotted and patchy appearance. Such places should be treated by rubbing them with a rag soaked in benzine. Any dirty marks can be removed by the use of glass paper.

When staining wood of poor quality, it is sometimes advisable to dress the surface so that the stain may be evenly. The dressing consists of a coating of size applied fairly thin and left to harden thoroughly before staining. Sizing is necessary before the application of varnish stains to new woodwork, as otherwise the porous texture of the grain will soak up the quick drying liquid before it is possible to work it.

All nail holes and other indentations must be filled in before staining. If water stain is to be used, the stopping is made up of plaster of Paris, or of wax mixed with suitable colours. Ordinary oil putty is used if the work is to be treated with oil or varnish stains. Care must be taken to avoid marking the surrounding woodwork with the putty, as this may leave such places lighter than the rest when the stain is applied. The holes are rubbed down level with glass paper afterwards.

The brushes required vary according to the nature of the work. For intricate parts of the work, such as mouldings and carvings, a narrow flat brush is the most suitable. A too fully charged brush is apt to give a streaky appearance to the wood, and there is the danger of the stain dropping from the brush on to the work.

The stain should be kept in airtight bottles, sufficient being made up to finish the whole of the work in hand, so that the colour will be uniform throughout. When required for use, it may be poured into a shallow vessel. Before applying the stain to the wood, it is advisable to test the colour on a spare piece of similar wood.

How to Use the Stain. The stain is applied by drawing the brush from one end of the work to the other in the same direction as the grain, working across from one side. It is essential that the edge of the colour should not be allowed to dry before the adjacent portion is stained, as this would result in a series of streaks; hence it is necessary to proceed smartly, especially when working on a large surface. A hot, dry atmosphere should be avoided, as one brushful will dry before the application of the next.

It is a mistake to begin at the centre and work outward, as this necessitates working two edges of colour.

Having covered the whole surface the brush should be pressed out to remove all surplus stain and lightly drawn to and fro over the work in a series of parallel strokes in the same direction as the grain. This will have the effect of removing any excess of stain in any one part. Some



Stain. Fig. 1. In staining a floor the brush is drawn with, not across, the grain, working from one wall towards the centre

workers prefer to finish off with a piece of muslin folded into a rubber, which gives a more even finish and removes all brush marks. Rub evenly and with only a moderate pressure, as otherwise the stain will be rubbed off in patches.

When staining a piece of panelling or a door, the panels are first attended to, working across from one side to the other in parallel strokes, taking the brush well into the corners and into the quirks. Any inner members of the framework are stained and then the rails, finishing off with the stiles. By this means the treatment of each successive portion of the work will clean off any stain inadvertently overlapping at the joints, as the brush can be drawn cleanly in a line with the joints in the same direction as the grain. The mouldings are finally stained, using a small brush and being careful to avoid touching the panels, especially when working on mouldings running transversely with the grain of the panels. The brush should be sparingly charged to prevent the accumulation of stain in the quirks and corners.

If a particularly dark colour is to be applied to a light wood, it is generally advisable to give two or more coats of a weaker stain rather than one heavy coat, as the latter is apt to dry

enough to require special treatment may be rubbed with a cloth ball. The latter, being partly composed of fuller's earth, acts as an absorbent and is therefore specially effective in removing grease spots. Various patent preparations are sold for removing either acid or grease stains, but before using them on delicate materials they should be tested on an odd piece of the same colour and texture.

Preparations of benzine, though labelled 'improved' or 'non-inflammable,' still require care in use, and should not be applied near a naked light. The article treated should be aired by an open window until the smell of the cleansing has disappeared.

Stains on alabaster ornaments can be removed with a paste made from whitening, soap and water. The paste is left on till quite dry and then removed with a soft cloth. A little powdered pumice is sometimes effective for the removal of obstinate stains. Stains on marble slabs, chimney pieces, etc., are best treated with half a lemon, dipped in salt. Wash off thoroughly and polish with a soft cloth.

Grease Stains. Stains on clothing caused by the spilling of gravy, oil, etc., should be sponged immediately with hot water or rubbed

Ink Stains. An ink stain on a white fabric should be sprinkled with salt at once, and then rubbed with a cut lemon. Rinse and wash off both cleansers at once. This method should not be used for coloured things as it may shift the tint; instead, try the following method:

Soak the stained part immediately in slightly warm milk. This should remove the mark if it is a fresh one, and the marked area can be rinsed, dried, and smoothed with a warm iron.

Another method is to rub the stain with half a ripe tomato, then soak it in cold water, and the remains of the mark will disappear entirely after the next laundering. Tomato juice is satisfactory on dark woollen material if afterwards well sponged with cold water.

Old ink-stains which have dried in can only be removed from white fabrics with care, as the strong remedies necessary will spoil coloured goods. There is also always a risk of the cleanser eating a hole through delicate fabrics. Spread the stained part over a shallow dish or bowl half full of boiling water. Moisten the mark with water, and place a tiny pinch of salts of lemon over the stain. The latter must be carefully handled, as they are very poisonous. Leave the salts about a minute, then pour a thin stream of boiling water through them and the stuff. Repeat if necessary, rinsing off all trace of the acid immediately.

When ink is spilt on a carpet, take up the moisture immediately with blotting paper, then rub the place with a rag dipped in milk, preferably boiled and dry with a dry cloth, rubbing hard. Or salt may be sprinkled on the stain, and rubbed with a cloth moistened in warm water.

Tea and Coffee Stains. For obstinate coffee stains on linen or cotton, a bleaching liquid made from $\frac{1}{2}$ lb. chlorinated lime, $\frac{1}{2}$ gallon boiling water, and 2 tablespoonfuls ordinary washing soda is effective. Turn the lime into a clean basin, pour the boiling water over it and then add the soda. Stir the whole with a wooden spoon, breaking up any lumps, and working vigorously to help the water to draw out the chlorine. Careful straining is then necessary to remove all the powder and leave the liquid clear.

The latter should on no account be used stronger than one part of bleaching liquid to 4 parts of hot water, and in the case of old or fragile materials, one part of liquid to 6 parts of hot water, or an even weaker solution, is advised. The article should be soaked in this for a short time, and taken out as soon as the stains disappear. A soaking in cold water and a thorough washing to remove all trace of the chemical are then necessary.

This bleaching liquid should never be used on silk or wool. Tea stains may be removed in the same way.

Grass Stains. Grass stains on fabrics which are too delicate to be washed should be treated with methylated spirit dabbed on with a clean cloth. If the material can be laundered, however, the stained part should be soaked in cold water, then covered with a little cream of tartar and left in the sun. Finally rinse with more cold water, and if the marks have not disappeared, repeat the treatment. For grass stains on linen or cotton goods, javelle water (q.v.) will be found effective. See Cloth Ball; Clothes; Dry Cleaning; Floor; Iron mould; Mildew; Paint; Petrol.

STAINED GLASS. The introduction of stained glass in a window for hall or landing depends for success on architectural features, the design and shape of the window and its useful purpose. When there is an ugly outlook, or one on to a blank wall, a well-chosen stained glass window may be a charming piece of decoration, which screens without seriously obstructing the light. The best effects are usually obtained by concentrating the design to a border and a top panel or central motif, and using rippled or muffled white glass for the rest of the window. This is a successful



Stain. FIG. 2. Using a piece of muslin folded into a rubber in order to remove brush marks. It should be lightly held and an even pressure maintained over the surface of the wood.

unevenly and show brush marks. Each coat must be allowed to dry completely before any further staining is attempted. Full directions for varnishing are given in the article on varnish.

Staining a Floor. For this, oil stains are preferable to water stains, because the former are more durable. Wax stain also is suitable. Varnish stains are best limited to small areas and should not be used at the entrance to a room where much treading of feet will quickly wear it out.

When staining a floor, it is important first to clean it thoroughly and to remove any grease marks. The floor should be sized and allowed to harden. Any holes are filled in with putty, wax, or plaster, according to the medium used, and the whole lightly glass-papered and dusted. It may then be stained working towards the door, so that it is not necessary to tread on the finished work. When using varnish or a varnish stain it is essential to avoid dust, as once this has settled on the wet surface it is impossible to remove it.

STAIN: How to Remove. If due to grease, ink, fruit juice, or any other cause, prompt treatment is always advisable. For the older a stain becomes, the harder it sets. In addition, it frequently causes holes by eating away the cloth.

Caution must be used in applying remedies, however, for many agents that are suited to cotton goods would have disastrous effects on silk, and what may with safety be used on thick dark-coloured materials would only produce fresh stains on delicate fabrics or cause the colours to fade. In all cases the fibre must be considered, and some knowledge of the different kinds of cloths is essential. Thus, acids have an injurious effect on vegetable fibres, and need to be neutralized by some other agent. Stains that are not obstinate

with a benzine cleansing preparation. If the fabric is coloured, the affected part may be placed over a cloth and rubbed well with turpentine. Begin at the outer edge of the stain and work to the centre, so that the grease may not spread. Continue rubbing until the dampened portion is dry, and then hang the garment in the open air.

Grease stains may also be removed with the aid of some blotting paper and a warm iron. Place the stained part between two layers of blotting paper, and continue pressing with the iron until all the grease is absorbed. Table linen stained with grease should be rubbed with soap in hot water, but this must be done before the linen is put to soak previous to the usual wash. Marks on white materials caused by machine-oil need special treatment, for they will not yield to washing. Dip the stained material when dry in benzoline and rub it well with a clean linen rag.

Calined magnesia is useful for the cleansing of silk, ribbon, or cloth that has become greasy. The material should be placed on a piece of cotton wadding, and the calined magnesia sprinkled over it. Lay another piece of wadding over it; then pass a moderately warm iron over the surface. The wadding should absorb the grease almost immediately. White of egg will remove grease spots from leather chairs, etc., if allowed to dry in the sun. Obstinate grease stains on rugs may be sponged with improved benzine or covered with powdered magnesia and brushed off 24 hours later.

A stiff, creamy mixture of pipe clay and water will remove greasy patches from wallpaper, etc. It should be left on for a whole day and night. Practical directions for removing grease from plain wood are included in the general article on the cleaning of floors (see p. 486).



Stained Glass: its decorative use in the home. Fig. 1. Two examples of roundels and reproductions of 15th century quarries introduced into the leaded light panels of a living room window

to be specially designed for the style of furnishing in use. Lighting effects can often be improved by tinting white glass panels in fittings with amber or red glass stain. See Glass, Lead Art Craft, Leaded Lights: Window

STAIR CARPET. Whatever the individual choice of colouring and pattern may be it is poor economy not to put down a type of stair carpet that will give lasting wear. Good qualities of velvet pile and hair carpet are always suitable, and for the country cottage coir matting has much to be said in its favour, as besides its durability it does not show footmarks. Thick felt pads should be placed under the carpet on each tread, and an extra yard of carpet should be allowed for each flight, to enable the carpet to be slatted up or down a little two or three times a year.

Stair carpet is usually stocked in three widths, 18 in., 22½ in., and 27 in. In a new make, colour and pattern it is obtainable in 36 in. width. When deciding on colour, and whether the carpet is to be plain or patterned, the width and lighting of the staircase, the wallpaper and the hall should be taken into consideration. Where a number of persons use a staircase it is often considered better to have a patterned carpet.

Where an oriental rug is placed in the hall the pattern of the stair carpet should blend in tone and be of the same type of design. A small conventional pattern is satisfactory with a tiled hall, the ground of the carpet repeating a note of colour in the tiles. Where it can be used, the patternless carpet is easier to bring into an effective decorative scheme. It may be all of one colour, possess a plain contrasting border, or show a narrow line of colour a few inches from each edge. The last two varieties are usually to be found in hair carpet. Hints on the economical laying of stair carpet will be found in the article on Carpet (q.v.)

treatment when it is made up from special pieces of glass put together with calms or lead strips to form leaded light panels as described in the article on Leaded Lights

A cheaper method for the small window is to have it glazed with opal or some translucent glass and to apply a design by means of prepared strips of lead, as explained in the article on Lead Art Craft, colouring the required portions with specially prepared stains.

Quarries and Roundels Decorative effects can be obtained by the use of small panels or roundels reproduced from 15th and 16th century designs. These are most suitable when introduced into leaded lights. The window gains in beauty and colour and where clear glass is used for the rest of the light there is no obstruction either of view or of daylight.

In the 15th century small panels and roundels with pictorial subjects were inserted amongst plain quarries (rectangular or lozenge-shaped pieces of glass), while quarries with sacred

emblems, monograms and heads or figures of saints were also used for church windows. These painted glass decorations were adopted in the windows of ordinary houses as well as of public buildings, and the subjects of the roundels became frequently secular while personal initials and heraldic devices were used for the quarries.

Beautiful roundels were painted with pictorial designs in black and white, often against a background of silver yellow stain. This style of painting is known as grisaille and dates from the Gothic period, though it was not apparently employed for roundels until the 15th century, when many magnificent panels and stained glass windows were painted in England. Henry VIII patronised German

and Netherlandish refugee glass window designers and their influence is noticeable in some of the English work of this style in the 16th century.

The decorative use of quarries and roundels for the home window is seen in Fig. 1. In this instance the shapes of the patterned pieces do not correspond to those of the plain glass, but break the uniformity of the leaded light panel by the pleasing manner of their insertion. Fig. 2 shows a lozenge-shaped quarry with the initials of Henry VIII and Katherine flanking the Tudor rose surmounted by the crown. In Fig. 3 the charming effect is seen of two rectangular quarries set in panels made up of glasses of similar shape. Again royal emblems are chosen of the lion, unicorn, rose and standard. The heraldic shield which is seen in the lozenge-paned light on the left of the picture is another pleasing example of the discreet use of coloured glass. Reproductions of quarries and roundels can be obtained to order at the Victoria and Albert Museum. They can also be sometimes picked up in antique shops. While large panels of old stained glass are expensive, small quarries have been bought for a few shillings; and finely reproduced roundels can be bought, but these are not cheap. Panels and roundels with good geometrical or conventionalized patterns have been introduced successfully into sash windows, but require



Fig. 2. Lozenge-shaped quarry with H and K, the initials of Henry VIII and Katherine of Aragon, flanking the Tudor rose surmounted by a crown



Stained Glass. Fig. 3. Discreet use of stained glass by the inclusion in a charmingly designed window of two rectangular quarries and an heraldic shield

STAIRCASE: PLANNING AND DECORATION

With a Survey of its Architecture at Various Periods

This article deals with one of the essential features of the house, and is therefore discussed to some extent under such headings as Cottage, Hall, House, Landing. See also Colour; Dado; Floor; Panelling; Stair, etc.

Few parts of a house require more careful planning than the staircase, which provides a means of access from the ground floor to the floors above, and at the same time offers great scope for decorative effect. It will almost always be found that a house with a well-designed staircase is easier to manage from the housewife's point of view than one in which the stairs are badly lighted, too narrow, or in some way out of keeping with the style of the house.

Economy of space is another leading consideration, and the location is very important. The severely geometrical designs essential to the construction of staircases admit of little variety in form, but in the materials used and in decorative details there is scope for original treatment. Some of the principal types of staircase are dealt with in this article, which also describes the component parts and constructional details of a simple form.

The materials used in stairmaking are generally either wood, brick, concrete, stone or iron. The stairs are made up of the following parts—strings, risers, treads, nosings, winders, landing, newel, handrail, balusters. The strings are the side members that receive the ends of the treads and risers, the latter two being housed and wedged into the former. If the stairs are fixed against a wall, that nearest to it is called the wall string, the other the outer string.

The risers are the vertical members which are placed across the stairs to receive and support the treads. They are housed into the immediate lower tread. The treads are the

horizontal members which rest upon the risers and receive the wear and tear of the stairs. The nosing is the front of the tread. As a rule it is rounded off or moulded, and projects beyond the riser about $\frac{3}{4}$ in.

Winders are those steps or treads that form an angle, if such exists, on a staircase. Their shape on plan is similar to that of a kite. Winders should be avoided if possible, and be substituted by a quarter landing, that is, a rectangular space the same width as the stairs both ways. The rise of the stairs is the vertical height from the surface of one tread to the other, and the going is the name given to the horizontal distance between the faces of the risers.

The newels are pieces of timber generally 4 by 4 in. in section. They are placed at the bottom, top, and at any change of direction of the stairs. The head and the pedestal of the newel are generally worked. The newels receive the handrail, the latter being tenoned into the former and pegged. The handrail is the member that spans between the various newels. It is rounded or moulded. If need over the outer string, balusters are placed between them tenoned into the string and handrail respectively. They are placed about 4 in. apart, two balusters being generally allotted to each tread. The handrail is fixed about 2 ft. 9 in. above the string.

In addition to the strings, the treads and risers should be supported by carriers, 4 by 3 in. stuff is generally used for these, and they are so arranged that each step is supported by either one or two carriers.

Rules to Determine the Pitch

The pitch of the stair is governed by the available space and height. It should generally be arranged so that the rise multiplied by the tread will produce 66 or thereabouts, e.g. 11 by 6, or 9 by 7. These proportions give very good results in practice. The former would be used in the best class of work, while the latter would be applicable to the ordinary dwelling-house.

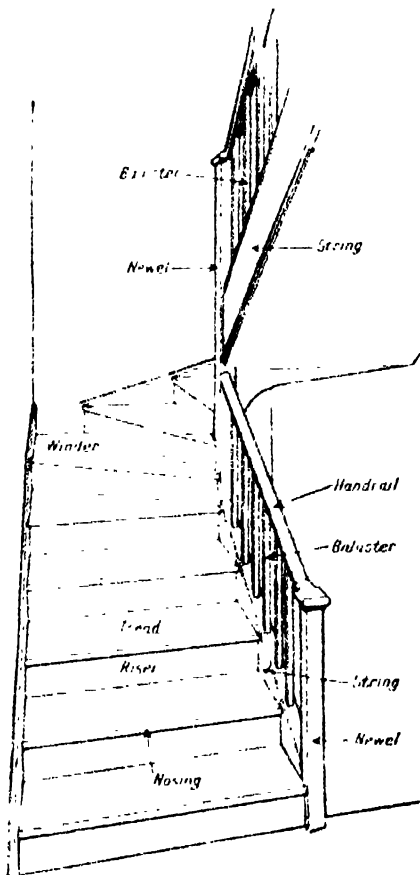
When the amount of rise and going has been determined, a gauge or pitch-board is made. This is a triangular piece of wood, the two sides forming the right angle being the gauge of the rise and tread respectively. By the assistance of the pitch-board and the plan of the stairs the newels and the strings are set out.

The housings for the treads and the risers are cut on the taper, in order that wedges may be driven to complete the fixing together of the strings, treads, and risers. The tenons and mortises are prepared on the newels, these latter being pinned to the strings during the fixing of the stairs. The width of the stairs should not be less than 3 ft. outside measurement. Stairs are often narrower than this, but it is undesirable, and in many instances very inconvenient.

Although in some of the newer small houses metal and concrete are utilized for staircases having steps of white or coloured composition, with rail and supports of metal tubing, the most common type is the timber staircase. Of these the two forms most used are the well and the dog-leg staircase. The latter consists of two or more flights so arranged that the outer string of each successive flight is immediately above that of the preceding one, the bottom newel of the upper flight acting as the top newel of the lower one. This form is chiefly used to economize space, and is seen in many terrace town houses. It is also the cheapest form of simple stairmaking. Fig. 2 shows an elementary type of such a staircase.

Fig. 3 is an example of a well staircase. This type of stairs is probably the most dignified in appearance and consists of two or more flights built so as to enclose a space. The example given is constructed round three sides of a well, each of the flights being straight and having two quarter space landings, thus obviating the necessity of using winders. The handrail is of heavy proportion, but being in combination with the bold newels it does not appear out of place. The upward curve to be seen at the head of each rail is known as a ramp and is used to bring the rail up to the required height for the beginning of the succeeding member.

Tudor and Jacobean Staircases. In the early Tudor buildings the most used type was known as the solid newel, and consisted of a central upright or newel from which the treads and risers radiated in a spiral fashion. These were usually of stone and of crude construction, and were dangerous, owing to the treads necessarily tapering to a point towards the central newel. With the advent of the Renaissance, although stone stairs were still constructed, wood stairs arranged in straight flights came into use, these being the forerunner of those in use in modern times. The earlier specimens were often composed of a series of solid blocks built into strings of similar heavy formation, but these were later superseded by a lighter form of separate treads and risers housed into the strings. A



Staircase. Fig. 1. Diagram showing positions of the various parts that make up a flight of stairs

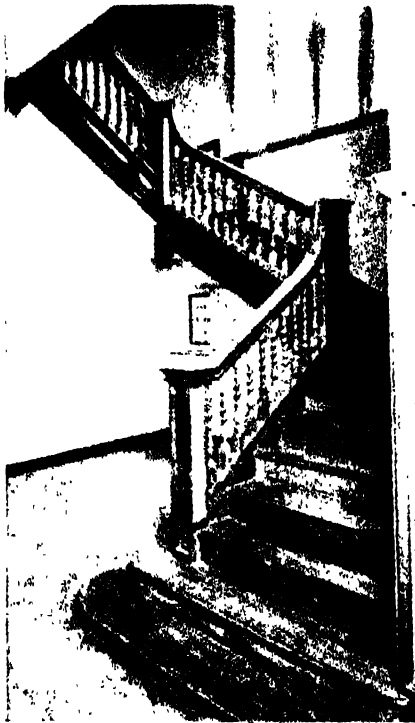


Fig. 2. Open type of dog-leg staircase, simple form chiefly used to economize space

notable feature of Elizabethan staircases is the treatment of the newel, which was carried above the handrail and was usually surmounted by a capping or carved finial. This treatment is found in many later oak stairways, and in adaptations of Tudor and Jacobean styles. An example is given in Fig. 2, page 568. In its simplest form such a newel post is shown in page 600.

A variation from the usual balustrading of turned spindles was that consisting of a series of pierced panels carved in scroll and leaf work in the characteristic style of the time.

The later Jacobean staircases were of similar formation to the Elizabethan, except



Staircase. Fig. 3. Well staircase of modern construction; a simple and dignified arrangement

that they were rather lighter. The turnings, in place of the heavy bulbous type, were slimmer, the handrailing of smaller proportions, and during the first half of the 17th century the newel was still carried above the handrail. This feature is probably a development of an earlier form, when the newel was continued from floor to floor in one continuous line. A style also found partially adapted to the modern stairway, as may be seen in Fig. 6.

Our next illustration, Fig. 4, shows a 17th century London staircase of unrivalled beauty. This is situated in Ashburnham House, now part of Westminster School, the building of which has been assigned to Inigo Jones between 1633-1640, or to his pupil Webb in the period between 1640-1670. This staircase is considered to have been planned and designed with consummate ingenuity and art. Its wide, shallow treads, carved balusters, fluted Ionic column, and its elliptical dome (not seen in the illustration) supported by a series of twelve columns, gave an effect of great dignity and spaciousness. The lovely 17th century panelling should be noted.

Staircases of the 18th Century. For the more intimate and cosy type of house which came into fashion in the reign of Queen Anne staircases were planned of much lighter construction. The heavy balusters and massive handrails disappeared in favour of a lighter and more elegant style. Three finely twisted balusters were sometimes found on each wide tread, and carving was discreetly limited to a delicate newel at the bottom of the staircase, and sometimes to brackets below the treads on the outer side which enriched the appearance of the flight when seen from the hall. In other 18th century staircases a railing of scroll work in bent iron was utilized in place of wooden balusters. This is yet another style adopted to day, in some cases all

the iron work being painted to tone or contrast with the walls, in others the handrail only being coloured.

Fig. 5 illustrates a staircase in mid-Georgian style with turned balusters painted white and carved and polished mahogany handrail. The lighter construction can be noted here. The handrail is shaped round the lower end in the form of a scroll, and is superimposed on the newel. Handrails of this period, and on, were often of such a light pattern that they were strengthened on the under side by the insertion of an iron core. The lighting of this well staircase—an important feature in the construction of all staircases—is particularly good from the admirably proportioned and situated windows.

Modern Staircases. Economy of detail is characteristic of many modern stairways in small houses, but often a charming effect is produced by the planning. An example is shown in Fig. 6. Nothing could be simpler and yet more harmonious in a modern cottage type of building. In the small terrace house the stairs usually have to be arranged within the entrance hall or passage, but in a detached or double-fronted house there is often opportunity for a stairway to be a characteristic feature of a hall sitting-room. In Fig. 6 this is the case. The interest lies in the slightly raised newels at the bottom, the continuation of the newels at the turn of the stair to the upper floor, the well proportioned moulded handrail and square balusters, and the small window in the solid timber partition on the left.

A completely different effect is achieved by the treatment of the wooden staircase in Fig. 7. With the addition of a nursery gate in corresponding style, such a staircase would be ideal in construction for a house where there are small children, as its solid balustrade would obviate accidents. It also has the merit of harbouring no dust, unlike the open type of banister. Interest is given to the design by the panels and the raised newels surmounted by balls. The staircase is painted to match the skirting, doors and window frames. Another interesting departure from convention seen in a modern staircase is to replace upright balusters with two thin,



Fig. 6. Modern staircase in a two-storey country cottage; it has been planned to make a charming feature in a lounge hall

Humphrey & Tava Joel

square rails between the handrail and stairs, and having only one or two matching supports at intervals between the newels. All the woodwork was stained light oak colour. Concrete is occasionally used as a balustrade in the form of an unbroken wall surmounted by a metal handrail and terminating at the bottom in a scrolled formation or pillar, while metal tubing has been employed for banisters in place of wood on other staircases.

Decoration and Finishing. The importance of selecting a suitable colour scheme for the staircase cannot be over-stressed. Brilliant colour is attractive in some houses, but it is advisable to remember that a neutral shade is far more likely to blend harmoniously with all the rooms which open off the staircase. The hall and staircase should unite the whole colour scheme of the house and no discordant note should be permitted in their decoration.



Fig. 4. Beautiful 17th century staircase in Ashburnham House, Westminster School, with Ionic columns, carved balusters and panalled walls. Fig. 5. Georgian staircase with gracefully turned balusters and carved mahogany rail

Courtesy of Country Life

Wallpapers and carpets with very pronounced patterns are, therefore, not a good choice. The modern liking for varnished paint and varnished marbled papers in pale tones of yellow beige green or grey for hall and staircase is to be recommended for two reasons. The first is that a pale, shiny surface reflects the light, and the second that such surfaces, especially when mottled, do not show dirt or marks, a consideration on a family stairway.

Sometimes the balustrade is accentuated by being painted in a darker colour to stand out against light walls as in Fig. 7; in other cases, as in Fig. 6, the woodwork is of the same colour as the walls. In the latter example the dark rich tones of the stair carpet are particularly valuable. A good effect has been also obtained by painting the treads and hand-rail black, while the risers and rest of the woodwork were painted white. A grey-green carpet with a deeper toned border and pattern, and the green marbled wallpaper treatment, with the applied landscape motif illustrated in page 569, completed an inexpensive scheme for a town house. Another staircase was decorated in shades of grey. The walls had a dark grey dado with dove-grey paper above, and all other woodwork, including staircase doors, was in two medium shades of grey. The stair carpet was also grey, but colour was introduced by rugs, window curtains, and a set of flower prints framed in lead (see Lead Art Craft).

While paint is most usual on a staircase, stained woodwork has much to recommend it. It is permanent, neutral in colour, and costs



Staircase. Fig. 8. The cupboard under the stairs in some houses is a dark hiding-place for unwanted things. Not so in this case, where an electric light reveals its useful contents at a glance.

little to maintain in good order. For the type of staircase shown in Fig. 3, brown woodwork has an excellent effect, and renders carpeting unnecessary if the treads and risers are of oak. Deal does not stain very well for this purpose, but British Columbian pine has a beautiful grain and, though dearer than deal, is worth the extra cost, which is comparatively little for the staircase and accompanying woodwork in a small house. The natural colour of the wood combines with a preservative stain to give a beautiful effect when wax polished. A scheme which included a dado of this wood, honey coloured walls and ivory ceilings would place no restrictions on the decorations of the rest of the house, and yet would be warm and inviting in itself. Such a scheme is, however, only possible for new woodwork when the choice of decorations rests with owner or leaseholder. Stains, especially those of a preservative kind, which give the best effect besides preserving the timber not only penetrate the wood (unlike paint, which merely coats the surface) and are difficult to remove, but also have a destructive effect on paint should it be wished afterwards

to make a change in the decorative scheme.

Stair Cupboard. In many houses there is a cupboard under the stairs which can be most convenient if its contents are easily seen and properly arranged. When used as a housemaid's cupboard and not as a hiding place for unwanted things it can be fitted with shelves, a broom rack and space left for the vacuum cleaner, etc. It is also a good hiding place for gas and electric meters. Where electricity

is installed a light which reveals the contents of the cupboard at a glance is well worth the extra point. Fig. 8 shows a stair cupboard fitted in this way. Note the wall socket at the foot of the stairs for radiator or vacuum cleaner.

STAIR ROD. The long, thin rod placed in the angle between the tread and riser of stairs to secure the carpet or linoleum is generally made of wood or metal. In selecting stair rods, it is well to bear in mind that those which are made of polished metal call for constant attention to keep them bright and in good condition, whereas only an occasional polish with furniture polish is needed for wooden rods. The good effect of oak stair rods is illustrated in Fig. 6 of the previous article. An oak rod with an oxidized metal eye or bracket is a useful fitting. The brackets are simply screwed to the tread and riser respectively.

To keep any type of brackets used at a uniform distance apart, it is a good plan to cut a stick or piece of wood of sufficient length to fit neatly between the two sides of the staircase or stringers of the stairs, and to cut two notches in one edge of the stick exactly where the metal brackets are to go. By using this stick as a guide and placing the brackets according to the notches, uniformity in line is ensured.

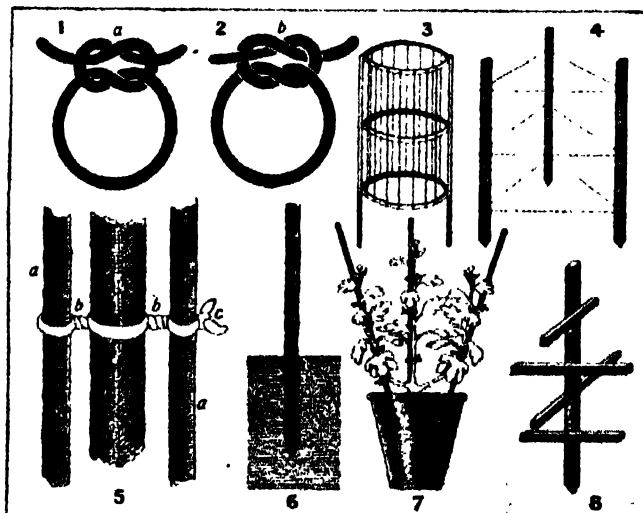
Instead of rods, clips or holders are often now used. A simple switching of the holders is all that is necessary to release or fix the carpet. There are no loose parts to be taken away and replaced. Such holders are finished in oxidized brass, copper or silver.

STAKING: In a Garden. This is an important detail in the cultivation of trees and plants. Standard trees must be supported by strong stakes or the head of branches may cause the stems to break. Suitable ways of supporting herbaceous border and other plants are shown in the accompanying diagrams. Plant supports ought to be as unobtrusive as



Fig. 7. Painted staircase planned for a labour-saving house. The solid construction of the wooden balustrade does not harbour dust.

Humphrey & Vera Joel



Staking. 1. Good knot for garden work: a, details of tying. 2. Same knot incorrectly tied at b. 3 and 4. Two useful supports of wood and string. 5. How to stake a tree securely: a, stakes; b, twisted ligature; c, knot as shown above. 6. Stake tarred or creosoted above and below ground. 7. Method followed in staking a pot plant. 8. General utility stake for border purposes.

By special arrangement with Amateur Gardening.

possible, and they must be inserted in good time, for if the stems become bent the flower display will be spoilt. The metal coil stakes are commonly used for carnations; they are of spiral shape and tying is unnecessary. Split wire rings also save tying.

Stamming. See Speech.

STAMP: On Documents. Certain documents, in order to be valid, need stamps, the value of which varies with the value of the

transaction for which the document serves. For instance, a contract note for the sale or purchase of any stock or marketable security must bear a stamp. This is (1952) 6d. for contracts between £5 and £10 in value, then after rising in increasing sums to a stamp of £37 10s. for contracts of £1,950. Contracts exceeding £1,950 must bear a £1 stamp for every increase of £50 or fraction thereof.

Stamp duties are also payable when land or houses or other property of that kind is conveyed or is sold. These are at the rate of one per cent. When the value of the transaction does not exceed £500, the rate is one half per cent. The stamp duty on a mortgage is (1952) 1s. 3d. every £100, or fraction thereof, with smaller amounts for those below £100.

A promissory note must bear a stamp. If it is for less than £10, the stamp is 2d. It rises

to 1s. for a note between £75 and £100, and is 1s. for every £100 or part of £100 above that amount. Stamps must also be put upon all life insurance policies. This is 1d. if the sum does not exceed £10, rising by 6d. for every £50 or part thereof, until on policies exceeding £1000 in value it becomes 10s. for every £1000, or part of that amount. All agreements, except when the monetary value does not exceed £5, must bear a 6d. stamp. An adhesive stamp can be used if it is affixed and cancelled at the time of the agreement, or a stamp may be impressed at Somerset House within 14 days. Other stamp duties are banker's cheques, 2d.; settlements, 6s. for every £100 part of the sum settled, and any kind of deed not charged under some special head must bear a stamp for 10s. See Land; Mortgage.

have been supplied originally to collectors in this way.

Stamp auctions by reputable firms are a familiar feature of the trade. They are held every week from early September to the end of the following July. Many bargains can be picked up in this way, and when the collector has gained a working knowledge of market values, etc., it would be worth while applying to one or other of the auctioneers for a sale catalogue, in which the lots to be disposed of are listed in single stamps, sets, or collections according to scarcity.

Exchange Clubs These provide another means for the economical extension of the collection, while also being a useful channel for the disposal of one's unwanted duplicates. Numerous clubs are in existence, their primary object being the circulation of a monthly packet containing sheets of stamps submitted for sale by members, each of whom has the opportunity of seeing the packet in rotation in accordance with a postal list supplied by the club secretary, who is charged with the settlement of the sales and the return, in due course, of un-sold stamps to the owners.

The stamp collector must learn to buy wisely if he hopes to sell to advantage. Condition is of vital importance. Each specimen must be examined to see that it is not damaged or defective, that its colour is true. If it is a used stamp, it should be refused if the postmark is very heavy, unless it is a really rare example. If it is a perforated stamp the perforations must be intact, unless it is a bona-fide variety such as that termed partly perf. On no account should a damaged stamp be mounted in an album unless it is a very rare specimen.

In the ordinary way the collection should be limited to adhesive postage stamps. Non-adhesive stamps printed on postcards, envelopes, letter cards, and wrappers are seldom included, nor fiscal or revenue labels, unless they have been used for postal purposes. Stamps available for both postage and revenue fiscally cancelled should be rejected altogether. Railway telegraph, and local stamps

STAMP COLLECTING

Practical Advice on a Popular and Educative Hobby

Devotees of other collecting hobbies will find in this work articles on the various subjects in which they are interested, e.g. Brass Collecting; Butterfly; China; Coins; Pewter Collecting

Whether he intends ultimately to specialize or not, the beginner should make himself thoroughly acquainted with the wider aspects of the hobby in the realms of geography and portraiture, cartography and industry, transport and navigation, history, currencies, languages, and many other subjects. A collection comprising one or more of these groups will be a source of constant interest to its owner and to his friends, whether they are stamp collectors or not.

Whether the two intends to be a philatelist or to remain a stamp collector only, he should start on general lines, laying the foundation of his collection either by means of the gift of specimens by the exchange of duplicates with other collectors, or by purchase from dealers.

Except in the case of the commonest examples, stamps have a recognized "catalogue" value, that is, the price at which they are quoted for in the dealers' annual lists; but it is not necessary for the beginner to buy them separately. Many firms make a specialty of packets ranging in price from a few pence to £50 or more, according to quantity and quality. Whole series of these are available, the contents so graded that no stamp is duplicated, the whole forming a nucleus for a general collection.

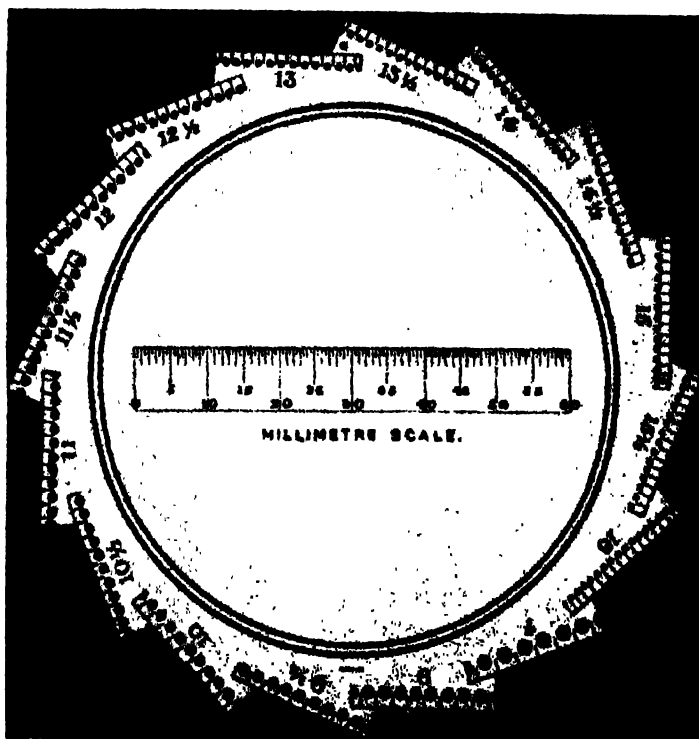
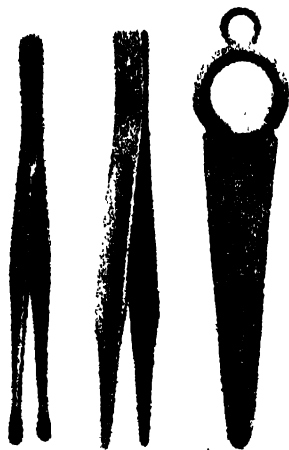
Each stamp, no matter how common, should be studied carefully, both as to its design and philatelic components and its status and value according to the catalogue. The purchase of mixed variety packets from different firms will, of course, result in the accumulation of duplicates; these will be useful for exchange purposes.

After a groundwork has been achieved by the packet system, the beginner is recommended to build up his collection by means of the sets of various countries. These sets may be representative of the whole output of the country in question, or they may be of one series only, and are sold in great variety from a few pence upward. The next step is to write to dealers for selections on approval. These are the specialty of many firms, who invariably offer a discount off the catalogue prices. Approval selections are mounted on sheets or in small books, with the price for each stamp clearly indicated. Such selections

should be handled carefully and, after retaining any specimens required, should be returned as soon as possible, together with the cash for those that are retained.

A standing order may be left with a dealer for selections to be submitted from time to time, according to one's specific requirements, clearly stated on what is technically known as a "want list."

If the collector intends to concentrate on the stamps of a certain country or issue, he should keep his eyes on dealers' announcements in the philatelic press, wherein specialized collections are occasionally offered for sale intact. If, on the other hand, he prefers to collect on general lines, and wishes to keep his album up to date, he cannot do better than join one or other of the several new issue services which exist for his convenience. Through their agency, and



Stamp Collecting: some of the requisites. Lower, star perforation gauge with sixteen variations, each in a space of 2 cm. Above, left to right: tweezers with rounded ends; same with pointed ends; pocket magnifier

should also not be mixed up with the ordinary postal issues in the album.

Necessary Accessories. Apart from the album there are three essential accessories which the collector should obtain at the outset, viz. a box of mounts (small strips of thin, transparent paper, gummed on one side for folding in the form of a hinge), a pair of tweezers, and an up-to-date catalogue. As he progresses with the study of stamps he will need a magnifying glass, a perforation gauge, and a watermark detector. Several sorts of magnifiers are made expressly for stamp collectors, with specially powerful lenses.

A watermark detector is a small black tile or japanned tray, on which a stamp, the watermark of which is undecipherable when held up to the light, is placed face down ward, and a spot or two of pure benzene applied to its back. Used in this way, benzene is quite harmless for all ordinary philatelic purposes, but it is advisable to procure the rectified brand. A few issues do not lend themselves to this treatment being printed

in fugitive colours, some of which disappear when plunged in the benzene bath.

In cases such as this, where the watermark is not apparent on ordinary scrutiny, risk of damage can be avoided by recourse to a simple photographic process, in which the stamp is used as the negative.

Other Requirements. Less important accessories include a surcharge measurer, which is a device like a pair of dividers, opening and closing with a screw adjustment, a chalky paper tester, and a mount damper or fountain brush for moistening stamp hinges. The testers consist of a fine silver point held pencil-wise, which, if the paper be chalky, will leave a slight black mark. The determination of the question of a stamp's surface, as to whether or not it is on chalky paper, frequently affects its value. Any piece of clean silver will serve as a test, which should be carried out in the margin of the stamp if possible, rather than on the stamp itself.

Peroxide of hydrogen is useful for restoring the original freshness to oxidized colours, but

no attempt should be made to expunge postmarks by means of chemicals. A pocket collecting-book and a supply of transparent envelopes are practically indispensable components of the outfit of even the most humble philatelist.

Varieties in the perforation of such stamps as were not issued imperforate must be represented by separate specimens in a specialized collection, but they need not concern the general collector. One of the principal objects in the philatelist's outfit is a perforation gauge. This is a printed card bearing a scale of dots of various sizes, ranging from 7 in the space of 2 centimetres (20 millimetres) to 17 in that width. By passing the edge of the stamp over the dots, it will be found that one or other of the 20 lines of holes will fit these, the figures at the side of the row indicating the gauge of perforation.

A stamp which has more than one gauge of perforation is said to be compound perforate, and in classifying such a combination the measurement of the top row of holes is placed first.

Thus the current postage stamps of Great Britain will be found to be perf. 15 by 14. If the perforation varies on all sides, which seldom happens, the sequence of naming is top, right, bottom, left—that is, the direction of the hands of the clock.

Apart from measurements, there are a good many kinds of perforation, as well as of *condition*, all of which are separately classified by the specialist, but need not concern the general collector. The main difference between perforation and rouletage is that, whereas the former punches out the holes, the latter merely cuts the paper but does not remove any portion of it.

Mounting the Stamps. Before mounting stamps in an album, any pieces of paper or old hinges adhering to their backs should be carefully removed. This can be done by floating the stamps face upward on tepid water, or by moistening between damp sheets of clean, white blotting paper, a dry sheet being laid out ready to receive them face downward on removing them from the water. Stamps printed in aniline inks should not be immersed in water, nor should those on enamelled or chalk-surfaced papers, which would quickly suffer if damped. Stamps should not be kept in a very warm place, as they are apt to curl up.

In the early days of the hobby it was the practice to fasten unused stamps into an album by means of their own original gum, and to gum or paste on the used ones. This has robbed the world of specimens which would have been well nigh priceless to-day had they been mounted by the method now in use. The modern method is as follows: Take one of the special hinges referred to above, fold back about $\frac{1}{4}$ in. of one end, gum side outward, lay the stamp face downward slightly moisten the turned back portion of the hinge, and fix it to the back of the stamp just below the top edge. Then moisten the other

The One Penny

1840

Black Small Crown Stamp

The first postage stamp ever issued—a page from the collection of F. H. Vallancey, showing method of annotation

Post



Mr. Thompson

5 Pembroke Square

Dublin



fold of the mount and attach it to the album in the place chosen for it. Do not use stamp edging or ordinary gummed paper for the purpose, as this will probably ruin the stamps.

Peelable mounts are easily obtainable, the advantage of these being that they can be readily removed from the stamp or the album, or both, without damage to either. It should be borne in mind that occasion may arise, from time to time, to examine the back of the stamp as well as the front, and the use of the special hinges makes this a simple matter. There is no need to wet the mount all over, a mere touch on both the fold is sufficient to make it adhere safely and to simplify its instant removal when required.

In mounting or unmounting, sorting or classifying, always use the tweezers; there is never any necessity for the collector to touch his stamps with his fingers.

Arrangement and Annotation. If using a printed album, the stamps should be arranged in catalogue order, that is, chronologically, spaces being left for specimens which it is hoped to acquire later. If a blank album is used, due regard should be had to the artistic arrangement of the collection. Single stamps look well when arranged in straight, horizontal rows, varying in length in order to obviate monotony as shown in p. 1192.

The stamps should be equidistant one from the other. This is facilitated by the faint ruled squares of the blank album pages. Each row should have the tops of the stamps level. Where blocks, pairs or strips are being mounted, a different plan must be adopted. A block of four or more looks best at the top.

Completing the Album. Whether the collection is a general or specialized one, the pages of a blank album should be embellished by brief neatly written, historical notes appertaining to the various issues displayed, showing the date of their appearance, the artist responsible for their designs, the engraver, printers, mode of production, kind of paper, water-mark and perforation, if any, and any other relevant notes of special interest. "Writing up" is an art in itself, and in highly specialized collections it may be elaborated considerably.

In such collections each issue, perhaps even one value of an issue, occupies several pages of the album, illustrating various stages of its career, shades, varieties, etc., and including examples of original sketches, essays, proofs and colour trials, and so forth. Used copies should not be mounted on the same page as unused ones, and separate pages should be reserved for those on entire, i.e. the original letter.

As a safeguard against damage by friction transparent envelopes, made of mica, may be had from many stamp dealers. These envelopes are as clear as glass, and add to, rather than detract from, the beauty of an artistically arranged album page. They are made in various sizes, for the accommodation of a single stamp, small or large, a pair



Enlarged reproduction of penny red stamp of 1858 1879, showing plate number 177 at sides. This plate is common and must not be confused with the rare plate 77

journal to keep him up to date with the philatelic news of the day, and aid to the extension of his scientific knowledge. In any event, a current catalogue should be his constant companion.

Advanced Specialization. Specialization may be extreme, that is, calling for every possible variety in all colours, shades, papers and perforations, or it may be modest, in which the very minor variations are rejected.

It is open to every specialist to introduce individuality into his collection, and this is often done by the process of "grafting," in which the collection is enriched by a variety of extraneous matter and extensive notes such as postal decrees, original notes and essays for stamp designs, etc. The practically unlimited scope of the hobby is one of its chief charms. Plating, that is, reconstructing a sheet of engraved or lithographed stamps in the form in which it was originally issued, is the most advanced phase.

A knowledge of the various processes involved in the production of stamps is very desirable, and indeed it is essential if the hobby is to be pursued on scientific lines. Generally speaking, stamps are produced either by line engraving (intaglio), lithography or surface printing, the last named being by far the most commonly used. When the philatelist has mastered the rudiments and technicalities of his hobby, it should be comparatively easy for him to separate line engraved stamps from lithographed or surface printed specimens.

A Useful Test. The following is submitted as a test for determining an engraved stamp. Take a thin sheet of tinfoil and place it over the stamp.

or a block of four, fitting over the enclosure like a sheath.

Collectors, having decided in what country or group they intend to specialize, a contingency which is naturally governed by their capacity for acquiring specimens, must learn all about the subject, by reading all the available literature regarding it, or by taking advantage of the displays and papers by other specialists which are arranged by philatelic societies from time to time.

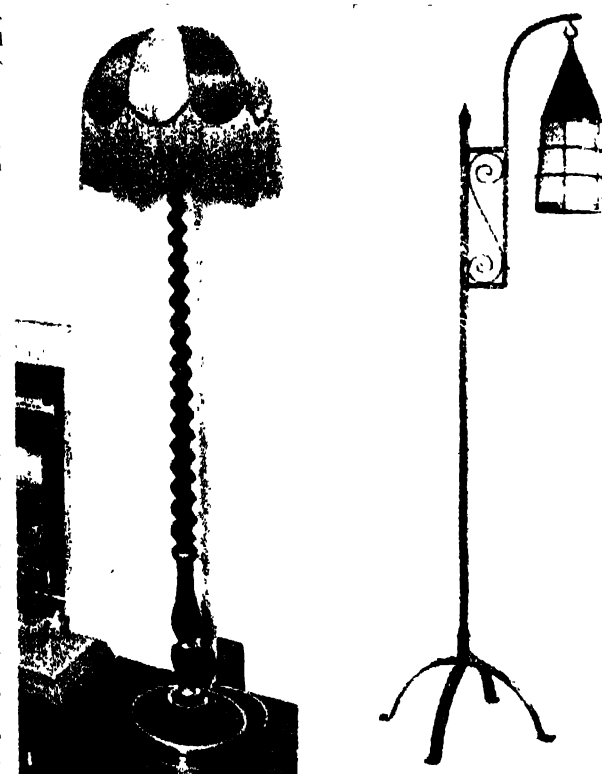
Every collector, specialist or not, should subscribe regularly to a philatelic

Rub it gently with the finger, and in a few seconds the raised design on the stamp, if it is a line engraving, will force its way into the foil, and a distinct raised positive of the design will show on the surface of the metal.

Surface printed stamps show a distinct, though usually very slight, impression of the lines of the design in the paper. A lithographed stamp, on the contrary, has no trace of ridges of ink, and the impression is never very clear, the outlines being more or less ragged. The first issue of Hungary and many of the so-called New Europe stamps are characteristic examples.

STANDARD FRUIT TREES. A standard fruit tree is one with a clear stem of 6 ft. or more high. The apple, pear, plum, damson and cherry are grown in this form for planting in orchards or large gardens. They come more slowly into fruit bearing than bushes or pyramids, but eventually they develop into large trees. Standards of apple and pear ought to be planted at 20 to 25 ft. apart and those of cherry and plum at about 15 ft. apart. If standard trees are planted in grass land it is most important that an area about 4 ft. from the stem be kept clear of grass and weeds. The pruning of standard trees is directed chiefly to thinning out superfluous shoots and branches to prevent overcrowding and is carried out in winter. See Apple; Fruit; Grafting; Pear; Plum; Stock, etc.

STANDARD LAMP. In the article on Lamps, and in those on Electricity, Electric Light Fittings and Gas, some general information is given about standard lamps. Floor standards are now usually adapted for gas or electricity, but occasionally an oil lamp is fitted with a stand. The drawback to this type is that it is more easily knocked over than a lamp placed on a firmly made table or bracket fixture. Whether wired for electricity, gas or oil, a standard lamp should be



Standard Lamp. Fig. 1. Floor lamp fitted for gas. The supply is obtained from the plug point in the skirting through the flexible metal tubing. Fig. 2. Standard lantern of wrought iron fitted for electric light. The design was reproduced by the Falcon Forge, Surrey, from a Puritan original

provided with a solid, well-balanced base. About 5 ft. 6 in. is a good average height.

Gas standard lamps with flexible metallic tube connexions are obtainable in good designs. An example is shown in Fig. 1 of a wooden floe standard with a fringed and dome-shaped silk shade. The wood is painted with brush cellulose lacquer picked out with silver metallic paint. Placed in the position indicated in the illustration there is little likelihood of a sudden pull on the lamp by anyone tripping over the flexible connexion.

Electric floor standards may be either severely plain in construction or highly decorated like the example seen in Fig. 2, a handsome gilded wooden lamp carved in an Eastern design and carrying a beautiful shade correspondingly ornamental. Equally beautiful lamps can be decorated in lacquer work.

Polished wooden standards in oak, walnut, or mahogany either suggest enlarged wooden candlesticks with twisted, fluted or baluster stems and heavy round or square bases, or are frankly modern in design, with base and stem formed of cubes, or of oval and square shapes combined. Metal is often utilized, either oxidized brass or copper, chromium steel or untarnishable white metal, or older styles are reproduced in iron work. See Lacquer Work: Lampshade.

STANDARD ROSE. There are three types of roses usually included under this heading, the half-standard, standard, and weeping standard. They are budded on the common wild briar or dog rose, or on the Japanese briar (*Rosa rugosa*) the latter is being used increasingly as a stock for standard roses. The stem of the half-standard is about 2 ft. high, that of the standard 4 ft., and of the weeping standard from 5 to 7 ft. high. Rambling and climbing roses are used to form weeping standards, and tea roses do exceptionally well as half standards. See Rose: Rose Garden: Stock.

STANLEY PLANE. This is a combination plane extensively used by practical workmen, and it has many different uses. It is supplied with a large number of cutters. By using the various parts and adjustments, the plane can be used for rebating, ploughing grooves, beading, reeding, and fluting for rounds and hollows, for making all shapes of moulding, for matching, chamfering, sash and dado, as a tillister and a shitting cutter. See Plane.

STAPELIA. Possessed of quaint, fleshy flowers, which emit a strong, disagreeable odour, the stapelia, in its native habitat in S. Africa, attracts carrion flies, hence its alternative name of carrion flower. The stapelia is suitable for culture in the greenhouse, the species *grandiflora*, shown in the illustration, being probably the finest. It should be potted in sandy loam.

STAPHYLEA. This is a hardy summer-leaving and flowering shrub, from 4 ft. to 10 ft. in height. *Staphylea* are suitable for sunny borders or shrubberies, in any ordinary soil. The flowers are white and are borne early in summer. The best is *S. colchica*, an early flowering sort, which may also



Staphylea. White blooms and pointed leaves of a summer flowering shrub

be forced for greenhouse purposes. Propagation is by cuttings in autumn.

STAPLE. This name is applied to a U-shaped fastening device. Another application is to the loop shaped fastener used in conjunction with a hasp and padlock. The small staples in common use, which are known as netting staples, are made of tinned or galvanized iron wire, and may be purchased for household use in the form of packets containing about a gross. Various sizes are available, ranging from $\frac{1}{4}$ in. to 1 $\frac{1}{2}$ in. long. The gauge of wire generally employed in their manufacture is No. 17 to No. 14.

A stronger kind is the fencing staple used for attaching wires to fence poles. These staples are generally from 1 in. to 2 in. long, and are made from bright wire of No. 10 to No. 6 gauge. Very strong staples are made with a pair of long thin points. Usually a thick gauge of wire is used, and such staples are handy for attaching a chain to a wall. Electric or telephone staples are made from flat wire, and when protected by a thin piece of fibre are known as insulating staples. See Gate; Latch; Padlock.

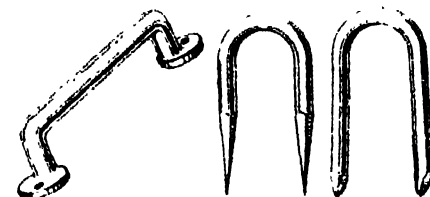
STARCH. Laundry starch is made from potatoes or, in better qualities, from rice. The potatoes are pulped and water run over them to carry off the starch, which is then washed and dried. Rice is treated with caustic soda to burst the starch cells, and when the starch is freed it is washed, dried and ground, washed again with soda, and finally with clean water. Starch is insoluble in

cold water. It improves the appearance of certain fabrics by making them smooth surfaced, the better to resist dirt, and stiff to avoid a limp, untidy look. It is used with hot water for muslins, linens and cotton materials which require slight stiffening, and with cold water for collars, cuffs and shirt fronts which are to be heavily starched. For the former purpose $\frac{1}{2}$ teaspoonful of borax and a few shreds of wax are added to 2 tablespoonfuls of starch, which has first been smoothly mixed to liquid form with cold water, and boiling water is stirred in until the starch and other ingredients become semi-transparent. If boiling water is added to dry starch the result is lumpy.

For cold water starch 1 teaspoonful of borax is dissolved in a little boiling water and added to 2 tablespoonfuls of starch, already mixed with cold water, and a few drops of turpentine. The last named improves the gloss and the iron runs more smoothly on the fabric. The mixture is strained, left for a few hours and well stirred before it is used.

In laundry work the process of starching follows bluing. The strength of starch varies with the article and its required stiffness. For laces, muslins and cottons, boiling water starch is used of about equal parts of the made starch and water. For slight glazing rather than stiffening, about 1 part of starch to 15 parts of water is required and for table linen about 1 to 8. Cretonnes and coloured prints should be starched in equal quantities of starch and cold water used to preserve the colour. A slighter stiffening for lace or muslin can be obtained by using water in which rice has been cooked.

Collars and cuffs are steeped in cold water starch, and then it is well worked into the fabric, wrung out and rubbed from the surface.



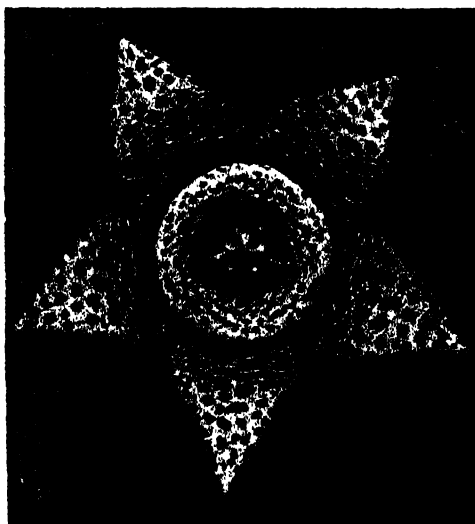
Staple. Left to right: Type for the support of straps around a box; strong wire staple with finely pointed ends; fencing staple for attaching wire to poles

The articles are rolled in a clean cloth and left for about an hour before being ironed; they are then spread wrong side up on the ironing sheet and any loose starch is removed before a hot iron is passed lightly on the wrong side to set the starch. When starching a shirt, the starch must be well rubbed into the front, neckband and cuffs, while care is taken not to starch the body of the shirt, which should be ironed first.

Medicinal Uses. As a food starch belongs to the group known as carbohydrates. Its value lies in the fact that it is easily converted into a readily digestible form of sugar. The starchy foods are digested by the ferments contained in the saliva and in the pancreatic and intestinal juices. Any starchy food should be cooked thoroughly to swell and rupture the granules and should be well chewed.

In medicine starch is largely employed as a basis for dusting powders and insufflations. Mucilage of starch is also employed to suspend insoluble oils or powders. For inflamed skin surfaces the following powder is suitable: Zinc oxide powder, 1 dram; boric acid powder, 1 dram; starch powder, 1 oz. To be thoroughly mixed. The powder should be placed in a cardboard or metal box, over the mouth of which a piece of gauze is stretched as a dredger.

The making of a starch poultice is described under the heading Eczema. See Diet; Food; Ironing; Laundry.



Stapelia. Curiously shaped flower of this greenhouse plant, sometimes known as the carrion flower

STAR OF BETHLEHEM. This is the popular name of a spring flowering hardy bulb (Ornithogalum umbellatum). It should be result in the handle being pulled out of the operator's hand. It is a dangerous



Star of Bethlehem, or Ornithogalum, spring and summer flowering bulbous rooted plant of great charm

planted in autumn, will thrive in shady places and bears greenish white flowers. Other kinds bloom in summer and should be planted in sandy loamy soil in autumn in a sunny place. Some of the best are nutans, greyish green; pyramidalis, white; and pyrenaicum, greenish yellow. The bulbs may also be potted in autumn for spring flowering in the greenhouse.

STARTER: For the Motor Car. With all types of internal combustion engine some form of starting device is required to transmit the initial movement to the crankshaft. In motor car design the starting handle is fitted for this purpose. It consists of a cranked handle, with about a 10 in. leverage, mounted below the radiator in front of the car, and engages with a short extension of the engine crankshaft. Fig. 1 below shows the general design and principles of the old established handle, also right and wrong ways of working.

There are three points to bear in mind when using the starting handle. The first is to see that the ignition is not too far advanced. The second is to let the handle lie snugly in the hand, as at B in the illustration, the third point is to see that all the control levers are correctly set and the petrol turned on.

On no account should the starting handle be gripped tightly with the thumb over the top, as shown at C. To hold the handle incorrectly is to court disaster should the engine backfire. A broken wrist or a dislocated elbow is an accident by no means unlikely to occur.

Before switching on the ignition, revolve the engine three or four times slowly. Switch on the ignition, engage the starting handle, and turn it slowly until the compression is felt just before bottom dead centre is reached. Then swing the handle past the bottom dead centre and finish with a very smart pull up. If the engine fails to start, engage the handle again and repeat the process. The greatest effort should be applied during the pull-up period only, because should a backfire occur it will only

practice to attempt to revolve the starting handle in barrel-organ fashion, unless one is abnormally strong or the engine is easily turned over on compression. Unless the speed is fairly high, there is always the likelihood of a backfire, and should this occur during the down stroke of the handle the consequences might be very serious.

As all modern cars are equipped with some form of self-starter, the starting handle is detachable and is carried on the car as a unit of the tool kit. This frequently means that the self-starter is employed as the starting medium for the engine from cold, which is a bad practice since a serious strain is placed on the battery. The proper method is first to give

the engine a few turns by hand, before switching on, thus overcoming the resistance caused by the cold oil and allowing a charge of gas to enter the cylinders.

Electric Starters. These are of two main types. In the first the apparatus serves a dual purpose, functioning as a dynamo to generate current for the batteries, or as a motor to supply the initial impetus to the engine for starting, current being taken from the batteries in the latter case. In the second type of apparatus, shown in Figs. 2 and 3, an independent starting motor is used and brought into engagement with the crankshaft when necessary.

The type of starter motor that is a combination of charging dynamo and motor is called a dynamotor. The unit is permanently driven off the engine crankshaft or somewhere else in the engine line, usually by silent chain gear, and is controlled by two switches, charging and starting. With the charging switch on, the unit works as an ordinary dynamo, but with the charging switch off and the starter switch on, the unit becomes a starter motor, thus rotating the crankshaft. An advantage of the dynamotor is silence. This type, however, is seldom employed.

Of the independent starter motor little need be said. Current is supplied from the accumulators to the windings of the armature, thus causing it to rotate. The chief point of interest

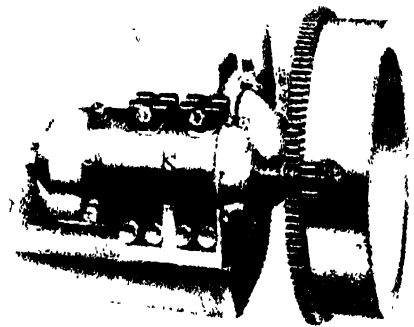
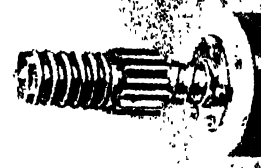
lies with the automatic means by which the pinion mounted on the armature is caused to engage and disengage itself with the toothed ring on the flywheel of the engine. This is carried out as follows. Cut on an extension of the armature shaft is a quick-pitch square thread, on which the pinion is loosely screwed, and retained when out of use at a definite position against a coiled spring. When the armature is caused to rotate, the pinion, being a free member, is drawn along the threaded portion of the shaft, thus bringing it into

engagement with the toothed ring of the flywheel. The duration of time between the commencement of rotation of the armature and that of the pinion is just sufficient to cause the pinion to screw itself along the shaft far enough to engage the teeth of the toothed ring. The moment this occurs, the pinion, by being held stationary, is readily drawn into full engagement.

To disengage the pinion the order is reversed. Current is switched off from the armature, causing it to stop, and the toothed ring on the rotating flywheel, now being turned by the engine, drives the pinion, thus unscrewing it off the armature shaft and out of engagement. Owing to the large gear reduction that must be used to avoid the necessity of employing a big, heavy starter motor, the pinion is thrown out of engagement with considerable force, and brought to rest without damage by the buffer spring.

With the ordinary electric starter motor the rapid acceleration causes considerable noise as the pinion teeth come into engagement. Moreover, the full power is applied on the teeth before they are right home. To overcome these drawbacks some types of starter motor effect the engagement of the pinion before it is caused to revolve, or while it is rotating slowly, the full current being switched on by a further movement of the control.

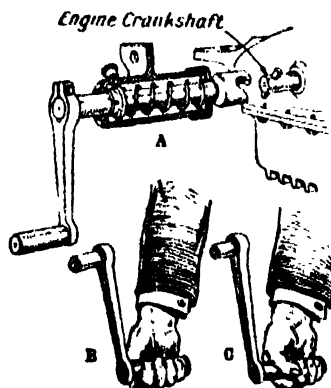
Faults with electric starters are very rare, and for this reason the carbon brushes, the commutator, and the various connexions are liable to be



Starter Fig. 2. Typical method of mounting an electric starter motor. Fig. 3. Showing quick-pitch screw, pinion and buffer spring

neglected. All these should be looked to occasionally and kept perfectly clean. What is of most importance is to see that the carbon brushes are clean and working freely, and that the commutator is perfectly smooth and free from any deposit of carbon and oil. A breakdown from any other cause in the majority of cases will be a job to be dealt with by the makers or an experienced man.


Starting Difficulties. Although, when the engine is warm, there is no harm in a limited use of the starter, such is by no means the case when starting from cold, because the gummy nature of the oil renders the engine very stiff, thus calling for considerable effort from the starter motor to turn the crankshaft at a sufficient speed. First of all, before switching on, revolve the crankshaft by means of the starting handle. A few turns, given slowly, will very considerably reduce the amount of current drawn from the accumulators during the starting process. If this precaution is not taken, it is probable that the efficiency of the accumulators will suffer. Serious damage, such as a buckling of the plates and loosening of



Starter. Fig. 1. A, principle of design; and B and C, right and wrong ways of holding the handle

Like Mould

jam. Then cut
de width of ma-
centre with jam.



Sponge Cream



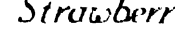
Sponge Basket

Cakes   *Syll*

Strawberry Fool



Strawberry Charlotte

¹ 10 cm₄ 3. 11.7

small percentage of chromium: it is intensely hard and is used for safes. Nickel steel contains a small percentage of nickel, which renders it very ductile. Manganese steel, containing a large percentage of manganese and carbon, is very hard but ductile, and cannot be softened by heat.

Steel can be hardened by heating it to a red heat in a clear fire, and then dipping it into cold water or oil. Steel is tempered by first hardening it and then polishing the surface quite bright with emery cloth. It is then heated up again until it assumes a certain colour, and again cooled. Soft steel is used for pressed and moulded articles, hard steel for cutting-tools.

The difference between iron and steel is not readily apparent without some knowledge of their properties. The easiest test is to drop the metal on a stone floor. Cast iron has a dull, dead sound; wrought iron has a higher tone and a dull ring. Mild steel is similar, but it has a slightly higher tone. Tool steel has a much higher tone and a well-toned ring, and the harder the steel the higher the tone. The best tool or high speed steel cannot be filed, and ordinary carbon steel is not in any way affected by the file when it has been hardened.

The difference between mild steel and wrought iron can be seen if a strip is bent over on itself and hammered; the steel will not break, but the iron will. If fractured, the grain of wrought iron is of a fibrous nature, the outside being of a dull black with a reddish scale. Cast iron has a dull grey granular appearance. Mild steel is somewhat granular in appearance, but it is a greyish white intermixed with bright sparkling grains. The outside is brightish black in colour. Tool steel is similar in appearance, but the grain is finer and the outside is a bright blue black.

Oil and soapy water are used as a lubricant in turning or shaping steel, and also to prevent the cutting edges of lathe tools from getting too hot; the lubricant is also used when cutting threads by hand.

Stainless Steel Containing a percentage of chromium, this is used not only for table cutlery, but for many purposes where a hard cutting edge is not required. Saucepans and other kitchen utensils, dish covers, trays, hot-water jugs, spoons and forks are all obtainable in chromium steel, while excellent use is made of this stainless metal for door furniture and bathroom fittings. **Tungsten steel** is hard, and is employed for metal cutting tools. Mild steel can be hardened by the process known as case hardening, which leaves a hard outer surface with a soft interior. *See* Brazing; Forge; Labour Saving; Lathe; Metal Turning; Metal Work.

STEEL: For Sharpening. This name is given to an instrument used for sharpening knives, especially carving knives. A steel is usually sold with carving knife and fork, the handles and finishings being alike. *See* Carving.

STEERING GEAR ON MOTOR VEHICLES

Principles of Operation and Method of Handling

Other articles that deal with allied subjects will be found under the headings Differential Gear; Front Axle; Gear; Live Axle. *See also* Motor Car; Motoring

From the point of safety, apart from the brakes, the steering gear is the most important mechanical part of a motor vehicle, and the principle of its operation should be thoroughly understood.

There are two classes of steering gear, namely the adjustable and the fixed. The former term denotes that the steering wheel is adjustable for height, sometimes carried out by mounting the steering box on a swivelling bracket. In another type the wheel is attached to a telescopic mounting arranged at the top of the steering column. With the fixed type steering, a specially shaped bracket is cast as a part of the steering box and bolted to the chassis side member.

In the majority of cases the steering gear is designed on the irreversible principle, which means that, although the front wheels may be easily turned by the steering wheel, a reversal of movement from the wheels to the steering wheel is not possible. In actual practice this is only carried out up to a point, and in most cases, if considerable effort is applied against the front wheels, the steering wheel is caused to rotate. This is as it should be, otherwise the caster action of the wheels that tends to straighten out the course of the car after a turn has been made would be lost; also the slightest movement of the steering wheel would definitely deflect the car's direction.

Apart from steering gear design the caster action of the front wheels is of great importance to easy steering, as it tends towards keeping the car on a straight course. Caster action is provided by either setting the stub axle behind the centre of the steering head, or by very slightly canting the steering head backwards. The result is to bring the projected point of contact of the steering head slightly in advance of the wheel's point of contact with the ground, as shown in Fig. 1.

For the 4-wheel motor vehicle the steering gear lay-out is commonly on the Ackermann principle, shown in Figs. 1 and 2, a rigid axle being fitted with a swivelling steering head at each end. These heads carry the stub axes on which the wheels revolve, and are connected to each other by a track rod, usually adjustable for length. The steering wheel controls the movement of the steering heads via the steering box and the steering arm. Movement of the steering arm must be

provided for in all directions. Therefore ball and socket joints are always fitted, and in the case of steering heads that are set outward at the bottom, it is not parallel to each other, it is necessary to employ some form of universal joint at each end of the track rod as well.

Owing to the fact that when the car is turning through part of a circle the outside wheel will be moving through a larger radius than the inside wheel, it is necessary to set the steering arms so that the correct angle is given to each wheel at all points between their limit of movement. This is carried out by setting the steering arms so that their end-cross imaginary lines drawn from the centre of the steering heads approximately to the centre of the back axle as shown by the dotted lines in Fig. 1. The same rule applies whether the steering arms are fitted in front or are fitted behind the axle.

The steering box is very strongly constructed, as the whole of the road shock is imparted to the wheel. It has to be withstood by this unit. Fig. 3 shows the type in common use. It consists of a worm mounted on the end of the steering column, that engages a worm wheel on the shaft on which is mounted the drop arm. The latter, by means of the steering arm, controls the direction of the wheels. Reference to the diagram shown in Fig. 2 will make this clear.

Although some makers still fit a worm segment, it is common practice to fit a full wheel as shown. As wear takes place the wheel can be turned a quarter revolution, thus bringing fresh teeth into engagement, it being understood that only one quarter of the worm wheel is ever engaged for a full movement of the steering gear. Flange bearings are employed for the worm and angle thrust bearings at each end, the latter being adjustable to take the load.

The screw and nut type of gear is characterised by simplicity of construction and saving of weight. A screw on the lower end of the steering column works in a nut, the latter engaging two levers attached to the operating shaft. As the nut moves along the screw the shaft oscillates and so operates the drop arm fastened to its outer end.

In the cam type of steering gear the specially cut worm engages and moves a pin set in the end of a short arm connected to the operating

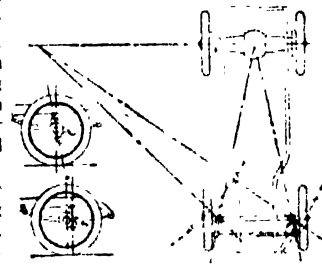


Fig. 1. Diagrammatic lay-out of the Ackermann steering gear. On the left two methods of supplying caster action for the front wheels.

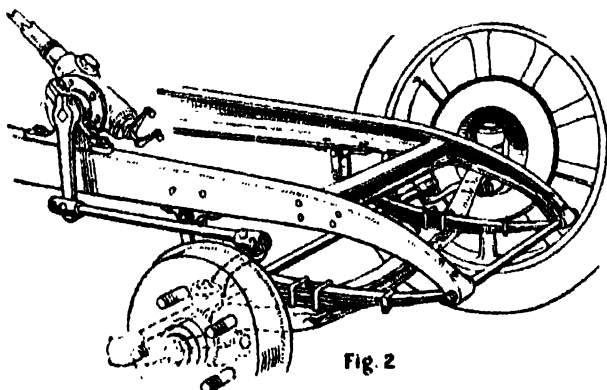


Fig. 2

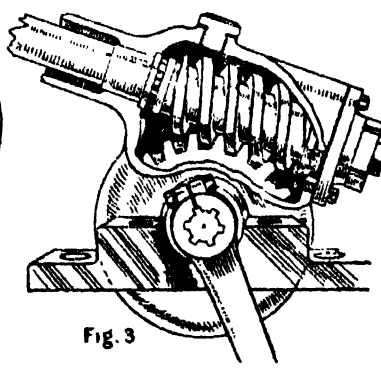


Fig. 3

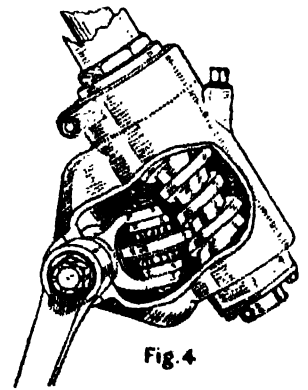


Fig. 4

Steering Gear. Fig. 2. General arrangement of steering mechanism on the Ackermann principle. Fig. 3. Worm gear employing complete worm wheel. Fig. 4. Another type of gear in which the worm on the steering column swings a rotating ring mounted on an arm fastened to the operating shaft.

shaft and thus to the drop arm, causing the latter to oscillate in accordance with the movement of the steering wheel. Another type is shown in Fig. 4. Here the worm on the steering column engages and swings a rotating ring mounted on the forked end of an arm fastened to the operating shaft. In order that the ring throughout its swing shall be properly engaged by the worm, the diameter of the latter increases towards its ends.

Care of the Steering Gear. A periodical overhaul should be given to all parts of the steering mechanism. It cannot be too much emphasized that all the bearings must receive regular and sufficient lubrication. The steering box and its attachments should be looked to first in the case of noticeable slackness, because it may be found that the linkages have worked slack owing to vibration and shocks transmitted from the wheels. The ball joints connecting the drag link to drop arm and steering head respectively should be examined as they are equally affected by any strains imposed. The joints should be well packed with grease and the same applies to the joints connecting track rod and steering levers. The track rod can be adjusted if it becomes necessary to correct the

alignment of the wheels. Wheel wobble is a condition in which the wheels get into a state of side to side vibration; in shimmy, another similar trouble, rapid vibrations are set up in the steering gear, and so transmitted to the driver's hands. Wheel wobble occurs at fairly low speeds, whereas shimmy arises when the car is travelling at high speed. Both conditions are a source of danger, as even a small deflection of the wheels from the straight ahead position may bring about a disaster when running at high or even moderate speed.

On modern cars, especially those having independently-sprung front wheels, shimmy and wheel wobble seldom develop. When these troubles do appear, however, attention should be directed to lubrication and alignment, and any excessive slackness in the mechanism must be corrected. In some cases the hitting of a steering damper, which introduces a certain amount of frictional resistance to the movement, will afford a remedy, though this can be regarded only as a makeshift and not sound practice from an engineering standpoint. Wheel wobble can sometimes be stopped temporarily by a sharp turn of the hand wheel. See Motor Car.

STENCILLING AND ITS POSSIBILITIES

A Decorative Medium Affording Scope for Originality

This article, being the first of a 24-lesson video, audio, and craft series, is the last of the *Latent Work* Project. For more information, visit www.latentwork.org.
Lettering, Monogram, Screen, and Color Print. (page 109)

A stencil is a plate made either of metal or cardboard on which a design has been traced and cut out for the purpose of transferring it to linen, cloth or other material. The transfer is accomplished by brushing over the stencil with oils, water colours, waterproof inks, or stum.

Almost any material can be stencilled. The best fabrics are probably easement cloth, velvet, satin, Arris cloth, and hessian. Chiffon, muslin, and similar thin fabrics can be treated successfully, but they must be stippled and not rubbed. Glass, china, wood, leather, imitation vellum, and cardboard all lend themselves to stencilling. The process is also employed in house decoration for freezes and panels, and other forms of ornament. The outfit required consists simply of the colours and brushes together with a piece of plate glass or marble for cutting plates, oiled muslin paper, a stencil knife, and a drawing board or table. Any good oil-colours may be used, but there are special stencil water-colours, and liquid oil-colours are sold in small bottles. No medium is required with water-colours, but for oils a stencilling medium is used. Inexpensive outfits are obtainable in any good art department.

When working in several colours on a one-plate stencil, it is advisable to use a piece of blotting paper or oiled manilla to cover up the design where the colour is not to go. This is called masking. The piece of paper is moved about to form a screen as the work proceeds. In doing very large quantities of any design,

a plate is generally cut for each colour, as one can work quicker, but for ordinary use a small mask is sufficient.

A separate brush should be kept for each colour, if possible. In working, the brush should be of a size suitable to the design that is to be transferred. If it is too small it makes the surface straky, while too large a brush is apt to cover more of the design than is desired and to necessitate masking. In Fig. 1, a hog-hair brush, a knife, and (lowest) a Japanese stoned brush are illustrated. Before using a new brush soak it in cold water. After the work is finished clean the brushes with a little turpentine on a rag and then wash them with soap and water.

Cutting a Stencil Plate. Many people prefer to buy stencil plates, but it is not difficult to cut out the designs at home and in this way original work can be designed or attractive patterns copied. The beginner should choose a simple design first. If a copy is desired, make a tracing or rubbing of the design on a suitable piece of oiled manilla, which is the best paper for the purpose, leaving at least 1 in. margin all round for small things, and 2 or 3 in. for large plates, or finely cut ones.

Place the plate on a piece of marble or glass, and, holding a well-sharpened steel knife at an angle of about 45°, cut out the design, working from the weak part of the plate towards the stout (Fig. 2). Never cut towards any part of the work if there is risk of breaking the ties, which are the portions of the plate left in to hold the design together.

In cutting a flower the centre should be cut out first, then the petals cut from the centre outwards. Always cut the side of the petal next to the one already cut. Do not cut the opposite side and then attempt to cut the petal after both sides are weakened. When a corner is

of the plate rough and untidy. Stencil plates must be clean cut. A very sharp knife is the only instrument for this purpose.

For stencilling on ordinary materials such as canvas or casement cloth, for china, glass or wood, oil-colours are most suitable. Waterproof inks are excellent for lampshade work as they are transparent. Barbola colours (see Gesso) are good for stencilling on leather or subtle articles. Bronze colours may be used and these are particularly effective on satin or velvet; patterns worked in silver and gold without other colours are most successful.

Stencil water-colours are used on parchment or for wallpaper decorations. For china and glass lacquer composed of sealing wax dissolved in methylated spirit may be employed. Break the sealing wax into small pieces, barely cover with spirit and leave for 24 hours (see Sealing Wax).

Stencilling with Oil-Colours. Take a palette and squeeze out a little of each colour required, then shake up the medium and pour a little into a small saucer. If necessary, pin the material out on a board, then fix the plate in position and fasten the top corners with drawing-pins. The lower part of the plate is left free, so that it can be lifted up at intervals.

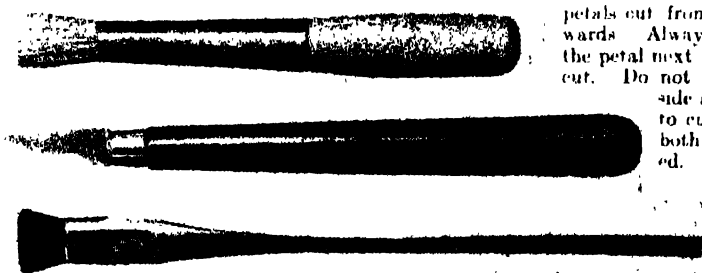
Dip one side of the crown of the brush into the medium, then, holding it almost upright on the palette, gradually work the necessary colour all over the crown. Rub the brush on an old rag or piece of blotting paper to remove any superfluous colour, use an up-and-down movement (Fig. 3) for all thick materials, working as much as possible away from the edges of the plate. Working against the edge of the design often makes a thick, hard line all round the edge, which is very ugly. A round flower should be worked in the centre first, round and round, gradually working in this way until all the petals are coloured in.

The prettiest effects in stencilling are obtained by working one colour over the other. For leaves, use yellow on the tips, green from the base, and draw the two together with a little brown blue, or red according to the leaf that is being coloured. When stencilling on a woven fabric is finished, allow it to dry, then place a slightly damp cloth on the right side, and iron on the wrong side of the material. Remove the cloth and press well. This is only necessary for fixing the colours, and need not be done otherwise.

Velvet must not be ironed. If necessary, cover the iron with a damp cloth, and pull the velvet over it. When working on a dark material it is necessary to kill it first, otherwise light colours will not show on it. It is possible to remove colour from the background with a preparation called Jarelló. The design is stencilled in the ordinary way with this and then put aside and washed. The design will then be bleached and pale colours may be stencilled on top of it. For a material which is unwashable, paint the whole design in white or a very pale shade of the colour to be used. When this foundation tint is dry, the stencilling is done over it in the ordinary way.

When stenciling on thin materials, do not work up and down, but stipple and gently pat the designs, holding the brush upright, as in Fig. 4. Use blotting paper underneath, and work with the brush as dry as possible. Lift the material off the blotting paper now and again, and it may be found that most of the colour is on the blotting paper, and very little left on the fabric. This usually means that the brush is either too wet or too hard. A Japanese brush, such as that illustrated, is best for very thin materials.

Stencilling on China. When stencilling on china, place the vase, bowl, or other article in a large pan of cold water, and the latter must be brought slowly to the boil. This process serves not only to temper the china and



Stencilling. Fig. 1. Tools used in the process: top, hog-hair brush; centre, knife for cutting stencil plates; bottom, Japanese brush for thin materials

render it less likely to break, but also removes any stains that might disfigure the result. Once the water has boiled, take the pan from the fire and leave the china in it until it is cold. Then dry it thoroughly, and, in order to guard against the possibility of a greasy surface, wipe it with a rag dipped in methylated spirit. The presence of grease will not only make the application of colour very difficult, but will also affect its permanency.

In working round any curved article it will be found necessary to snip the stencil plate top and bottom. Use the brush very dry and the colours sufficiently thick to prevent any white patches from showing through. Stippling is the best method, as the plate is difficult to fix and will be inclined to slip. When the design is finished take off the plate, and with a clean rag wipe off any surplus colour. Begin drying the work in the open air, or, if this is impossible, in a cool oven and when it is almost dry hold it in the steam of a fast boiling kettle. This fixes the colours so that washing does not affect them.

When stencilling on glass use oil tube colours with quick drying medium or special colours for painting on glass (see pages 533, 534). The article to be decorated must be polished with methylated spirit to remove all grease. Oil surfaces such as wood, metal, china or glass require a dry brush, as all the colour remains on the surface. Wood stuns may be used for stencilling unpainted wooden articles. When finished and dry, the work may be varnished or wax polished.

Florescan Stencilling. A very attractive form of stencilling which resembles the Florentine work of the 17th century is known as Florescan Stencilling. Handsome cushions, blotters, fans, curtains, etc. can be made by stencilling suitable designs on velvet, satin, leather, suede, gauze, or georgette. Florescan colours are sold in tubes and used with a medium. If required to wash or when painting on leather, the washable medium must be used. Japanese brushes should be employed.

Stencilling Curtains. Casement cloth for short curtains takes the colours very well, and has a matt appearance when finished.

In working stencils on curtains or covers the corners must always be taken into account. If possible work all the corners first, and then arrange the centres of the sides. The other way is to place the centre of a design in the exact centre of one side and then arrange the corner. Never work up to a corner or the centre without finding out whether the plate will fit. If not, it will be necessary to find some portion of the design which can be repeated to fill in any space.

A good example of stencil work for a

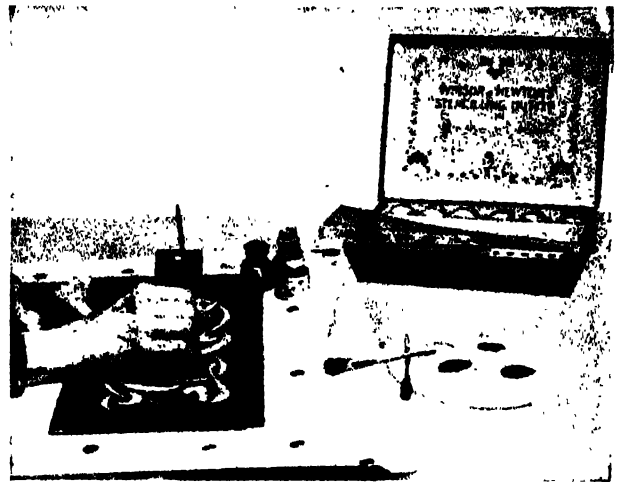


Fig. 6 are typical of the possibilities in this direction. The first is a dish mat, painted orange with gold border on which lines are drawn with outlining ink using a fine sable hair brush. The design is carried out in pale green, purple and black oil-colours and stencilling medium.

A monogram is an attractive feature introduced into a set of table mats as suggested in the second example illustrated. Colouring should match the dinner service in use. The third design portrays a peacock stencilled in blue, gold and green. If a dark colour is used for the groundwork of the mat, a coat of white should be applied to the bird and allowed to dry before stencilling with the proper colours. The design may be outlined in gold if desired.

Many other uses for stencilling will be discovered in connexion with other art crafts. In conclusion the following points may be stressed. All bottles of medium should be well shaken. Liquid stencil colours should be kept stirred while in use. Brushes must not be too heavily charged. Superfluous colour should be removed on a piece of blotting paper before the work is touched. All



Fig. 3 (below). Showing the correct way to hold the brush for stencilling with oil colour on thick material. Fig. 4 (above). When stencilling on thin materials use a Japanese stencil brush and stipple the colour. Courtesy of Winsor & Newton.

curtain is seen in Fig. 5. In this particular case the corner was stencilled first and made to lie well inside the hem. The latter may be used as a guide, provided that the edges of the stencil-plate are true. The use of a skirt-board is an advantage, because it allows a good deal of the curtain to be pinned down at once. Stencil up the whole length of one side and along the bottom, arranging the medallion in the corner.

To get the best results the stencilling should be done before the top is gathered. The material will then lie flatter, and can be more easily ironed. Any colour scheme can be used so long as it tones with the room in which the curtains are to be hung. As soon as the stencilling is finished, cover it with a slightly damp cloth and non first on the right side and then on the wrong side. This makes the curtain washable, and also fixes the colours. Thick stencilling should be avoided, for thin material hangs badly if much colour is used.

Decorating Cork Mats. Cork table mats may be successfully stencilled. The three examples shown in

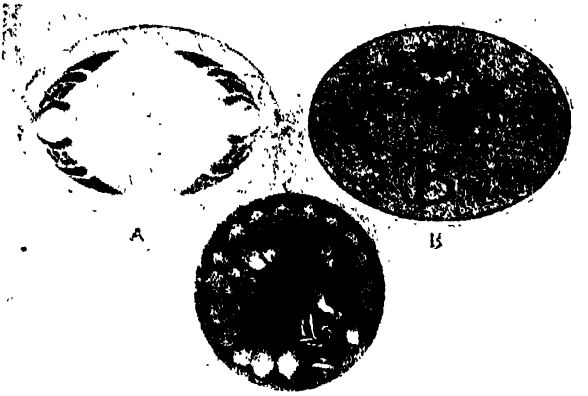


Fig. 5. Part of a curtain ornamented with a stencilled design around the hem and a stencilled medallion in the corner.



Stencilling. Fig. 2. When cutting a stencil, hold the plate firmly with the left hand, which should be above the knife to avoid any risk of cutting the hand should the knife slip.

Courtesy of Winsor & Newton



Stencilling. Fig. 6. Three stencilled designs on cork mats for table use. Colouring should match the dinner service.

Courtesy of H. H. Heathman & Co.

stencil plates should be cleaned as soon after use as possible. Rub them with a piece of paper or rag, then clean them with turpentine. Hang them up to dry, or lay them between pieces of newspaper.

STENOSIS. Derived from a Greek word meaning narrow, the word stenosis is used to describe the narrowing of any of the natural apertures of the body.

Mitral stenosis means narrowing of the mitral opening, that is, the passage between the left auricle and left ventricle of the heart. It is a serious form of heart disease liable to follow acute rheumatism.

Pyloric stenosis affects the lower opening of the stomach, or pylorus, usually as a result of ulceration in the neighbourhood, or as a functional disorder in infancy. As a consequence the stomach is unable to empty itself properly and becomes dilated.

Stenosis, in general, results from one of three circumstances. An obstruction may lie in the opening itself; it may be due to disease attacking the edges of the opening, as in the two examples cited; or it may arise from a tumour outside the organ exerting such pressure as partly or wholly to close its aperture. See Heart.

STEPHANOTIS. The house evergreen climbing plant called stephanotis bears fragrant and beautiful white flowers nearly all the year round. Stephanotis can be grown in pots, or it may be planted out in a well-drained bed consisting of turfy loam, one-third each of decayed manure and peat and sand.

Very little water is needed in winter. An average temperature of about 70° is the most suitable. Weak growths should be thinned out from time to time. A limited number of strong, thinly-disposed shoots are best. Propagation is by cuttings of the previous year's shoots in the propagator in spring. See Illus. above.

STEP LADDER. The difference between a step ladder, often referred to as a pair of steps, and an ordinary ladder is that in the former the feet rest upon flat pieces of wood, or treads, and in the latter upon rounded ones, or rungs. Another difference is that the step ladder is made in two pieces, a front and a back, which are hinged together so that when opened out it will stand alone. An ordinary ladder, on the other hand, must lean against something before it can be ascended. As step ladders are much safer to climb and usually much smaller in size than ordinary ladders, they are much used for

household purposes; such as hanging pictures and curtains, cleaning windows, and the like.

Step ladders are made in a number of sizes, and into some of them various contrivances are introduced. They range in height from 2 ft. to 16 ft., but probably the most useful sizes are those between 5 and 8 ft., with 6, 7, or 8 treads. Some are made so that the individual steps will fold up when they are put away, and others have a hand pole at the top. Some are double, having steps on both sides, while others have a special platform on which a bucket may stand while cleaning operations are

in progress. Other steps, again, are so made that the worker can sit thereon in comfort.

The steps most commonly used are those with a hinged back and rope stays. They are made of deal, and are obtainable at a low price. When purchasing, it is advisable to examine the wood, particularly in the treads, so see that the grain is fairly straight and free from large knots. The treads should be set well in the sides, and if possible provided with iron bolts top and bottom. Chain is preferable to rope, as it is not liable to stretch and lasts longer.

The user of a step ladder should make sure that the legs are firmly placed on the ground before it is ascended. Now and again any rope that connects front and back should be examined, as this may become frayed and

so give way.

Fig. 1 shows combined steps and ladder. In this position the ladder portion forms the rest for the steps.

Repairs. A step ladder occasionally

needs repair, especially if it has not been very well made or has been left outdoors exposed to the weather. The joints may become loose, the ropes may rot, and the hinges get rusty and break. Frequently, too, the top step is knocked off or loosened.

To repair a ladder that has reached the state described the steps should be extra nailed with 2½ in. oval wire nails, and, if possible, glue



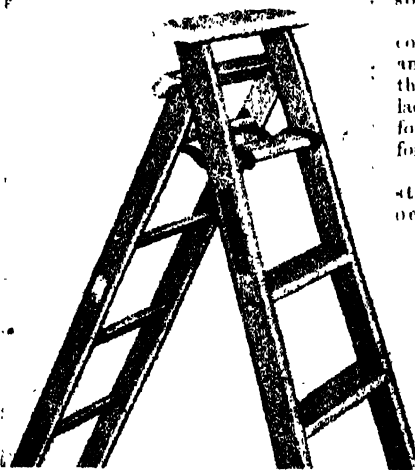
Stephanotis. The fragrant white flowers of an evergreen greenhouse climber. See article on this page.

should be run into the trenched joints. There will usually be room for two new nails at each joint. The heads should be punched down and the holes filled up with putty. The top step should also be extra nailed, as should the back hinged board. Care should be taken when nailing into the edge or straight grain of the wood, which is likely to split; holes should first be pre-drilled with a bit.

If one of the treads is damaged, it can be renewed without disturbing the others. Saw the old tread in two places with a tenon saw well away from the nails, and then pull the end portions away from the groove. Tap the points of the nails and withdraw them with pincers. The new tread should be planed up from a piece of straight grained sound wood, and cut to the exact length between the two grooves. The groove and the ends of the tread should be coated with glue, and the piece pushed into its place.

In nailing, use new places on outer piece.

The mortise and tenon joints of the back strut frame should, if loose, be reglued and wedged. If the tenons are broken it is best to make a new rail. A less satisfactory way is to glue the pieces together and fix a new rail across both joints with glue and fine nails on the outside. The hinges can be replaced by a new pair. The rope should be of strong window sash cord, and care should be taken that it is the correct length to give the right spread to the ladder, making it stand firm and level on the floor. The knots should be on the outer side of the wood. A step ladder should be painted to keep it in good condition. See Ladder.

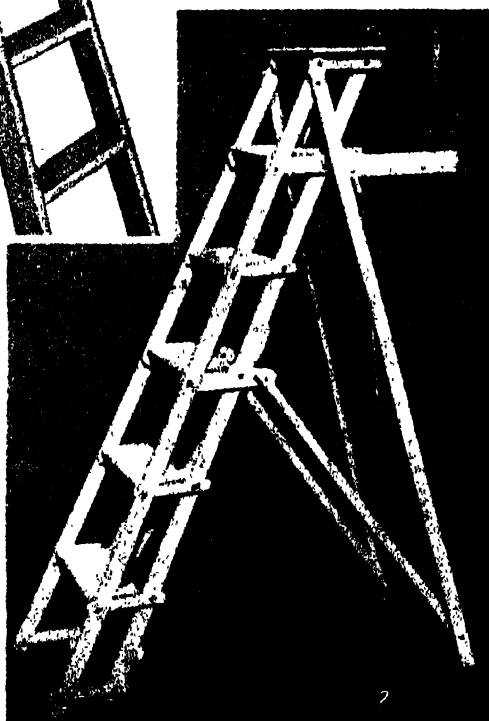


Step Ladder. Fig. 1 (above). Combined ladder and household steps. The back portion can be removed and attached with the clamps to the steps, so approximately doubling the length of the ladder.

Courtesy of H. H. Heathman & Co.

Fig. 2 (right). Folding step ladder with tray for bucket.

Courtesy of J. H. Heathman & Co.



STEPS AS A GARDEN FEATURE

Viewed from both Practical and Ornamental Standpoints

The construction of a flight of steps is by no means a difficult task for the amateur worker. For further information he should consult the articles on the various materials, e.g. Brick; Cement; Concrete; Stone. See also Crazy Paving; Garden; Path; Paving; Pier; Rock Garden.

Where the garden slopes gently a very pleasing arrangement of steps, as illustrated in Fig. 1, can be adopted, which combines the function of a path and that of a flight of steps. The whole is constructed of crazy paving, and the steps are comparatively low and the breadth considerable. Fig. 2 shows a method useful in small gardens and positions where there is a drop from the garden level to that of the ground floor or sub-basement. The steps here illustrated are made partly with crazy paving, but the nosing or edge of the treads is finished with hewn flagstone.

When it is possible to use rough-hewn stone of the type generally known as rubble masonry, a very handsome type of steps can be constructed somewhat as shown in Fig. 3. Retaining walls are built at the sides, and the steps are formed of roughly hewn flagstones set in rough masonry and embedded in cement mortar on foundations of broken brick.

Flight of Brick Steps. Fig. 4 shows a flight of six steps with brick wing walls and brick piers. The path from the top step to the doorstep is laid with brick. The doorstep is flanked on either side by low piers of brickwork, those at the entrance being topped with capping stones.

The difference in level between the approach to the house and the carriage drive is 27 in. This height or its equivalent on any other job has to be divided between any number of steps that can conveniently be built with bricks, plus the difference in level due to the fall of the path. In this case a fall of 2 in. is allowed from the door to the uppermost step. Each of the five treads of the steps has a fall of $\frac{1}{2}$ in.; the five brick courses of bricks set on edge are each $4\frac{1}{2}$ in. high, thus making up the required total, namely 27 in.

When details of this kind have been settled for any particular job a drawing of the steps should be worked out, such as that shown in Fig. 4, taking particular care to dimension the courses properly, according to the number of

bricks used. Commonly, the dimensions for measuring purposes can be taken as 9 in. long, $4\frac{1}{2}$ in. wide, and 3 in. thick. When the plan has been settled satisfactorily the ground should be marked out with pegs and lines, and a trench excavated on each side to receive the foundations for the wing walls. The excavation need not be carried down beyond the point at which the ground is firm and solid, so long as a depth of about 4 in. of concrete can be laid as a foundation. This should be placed on another foundation of broken brick or stone. A trench should be dug to receive the foundations for the bottom step. This should also be filled with concrete and roughly levelled off with a shovel, as in Fig. 5.

The first proceeding is to lay a bed of mortar on the foundations for the front step and the two entrance piers, and commence by laying three courses of bricks at each pier. The bricks which are to form the step are embedded in mortar and should exactly fill the space between the two piers; they should fit tightly and may be driven home with the handle of a heavy hammer, as in Fig. 6. Six more courses of bricks are set on each of the piers, and the side walls built up. These may be laid in the ordinary Flemish bond, the arrangement of the bricks by this method being clearly shown in Fig. 7, where the headers and stretchers are clearly distinguished. The worker should refer to the article Brick for further details of the method of bonding.

It should be noted that as the normal surface of the ground rises, the trench, with the levelled concrete in it for the foundations of the side walls, need not be kept in one main level, but may be stepped up. This result can

best be achieved, by the amateur worker, in first preparing the foundations for the lower part of the wall at a reasonable level, placing a couple of bricks on end on the concrete, and laying in a bed of concrete to the level of the top of the top brick. This forms the stepped foundation, the height of the step being proportional to the height of the bricks, thus avoiding much cutting and making up with mortar.

Care should be taken to plumb up the piers and the walls as the work proceeds, and to drive up the bricks by tapping them with the end of the trowel. The second step should then be laid with bricks as before, well embedding them in cement mortar. The ground between the walls is cleared away level, some hard core rammed into it, and the foundations for the next step made by filling in with concrete to

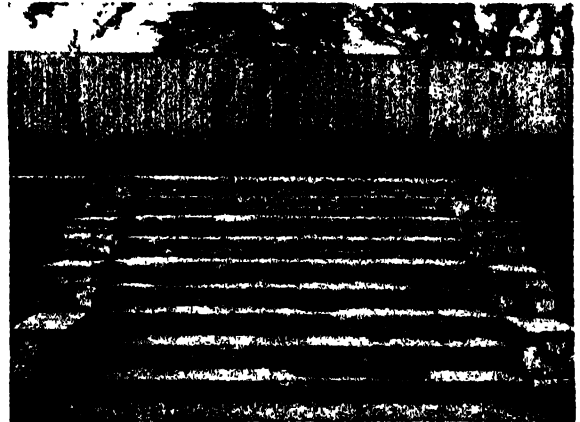


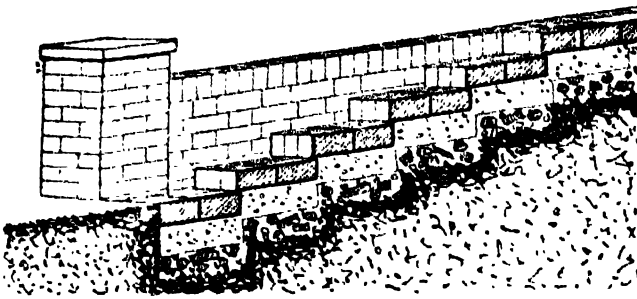
Fig. 3. Showing the charm of a flight of shallow steps made of flagstone and rubble masonry flanked by retaining walls.

the level of the previous step, as is visible in Fig. 8. The work then proceeds in a similar manner as before, by laying another step in brickwork, giving the bricks a gradual fall to ensure that water does not lie on them, and driving them well home.

After the third step has been laid, the earth between the walls is again excavated, the concrete foundation prepared, and another step laid in brick. When within two steps of the upper surface, a header course of bricks should



Steps. Fig. 1. Picturesque effect achieved by the use of crazy paving for a path which rises gradually in shallow steps. Fig. 2. Steps connecting different levels in a small garden; they are of crazy paving finished on the edges of the treads with hewn flagstone.



Steps. Fig. 4. Sectional view showing method of construction of a flight of six steps with brick wing walls and brick piers

be set on the side walls as shown in Fig. 9. This gives a finish to the work.

The last remaining steps are then laid and if the work has been properly done the top flight of steps will be exactly the same level as the top of the header course on the two side

walls. The ingredients needed for a mixed stew are 4 lb. beef kidney, 1 lb. pork (not too fat), 1 lb. mutton, 1 lb. veal, 1 1/2 lb. potatoes, 1 1/2 lb. onions, and 1 lb. carrots. Green peas might be used instead of the

body, e.g. the noises produced by breathing and by the action of the heart. In disease these sounds are modified or added to, each change having a diagnostic significance.

STEW. A stew can be made with either beef mutton, or veal as the main ingredient, and directions for making such

covered vessel, generally with very little added liquor. By this method tough portions of meat are rendered eatable, and very little heat is required to maintain the proper temperature after the food has been boiled. None of the juices of the meat are lost, and the food can be kept hot without deteriorating.

A stewpan, a casserole, or an earthenware jar may be used, and it is placed in the oven or on the top of the stove. Before starting the slow process, meat to be stewed must be well boiled up, or it will sour. A stew is nearly always thickened, and meat stews should be made with fresh, not cooked, meat. The stew may be white, as in the case of Irish stew, or brown, as in stewed ox-tail or skirt of beef. Vegetables are usually stewed and served with meat. Fish may also be stewed; trout or eels make excellent stews.

Stewed Fruit. Stone fruits are much more digestible when stewed, and if served with some accompaniment of a milky nature they are less likely to disagree with children or those persons whose digestions are weak or impaired. For this reason it is the custom to serve cream or custard with stewed or cooked fruit, and sometimes milky puddings or blancmanges. One advantage of stewing fruit consists in being able to cook any that is not actually ripe or is in the green stage. Gooseberries, for instance, when quite unripe, are excellent for stewing, but are not fit for this purpose.



walls. This result is only accomplished by the constant checking of the level between the two side walls, by resting a batton across them and then testing with a spirit level.

The brick path is laid in the usual way, two small piers built by the doorstep, and the entrance piers completed in readiness for the capstones. These can be obtained from a mason's yard, or may be moulded in concrete.

STERILIZATION. The process of making certain substances free from germs of all kinds is usually called sterilization. A large number of different methods are used, the choice depending in any case on the materials of which an object is composed and also upon the uses to which it is to be put, etc.

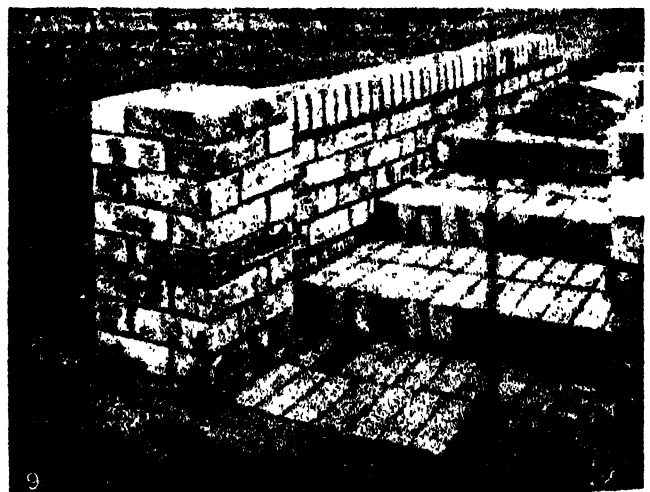
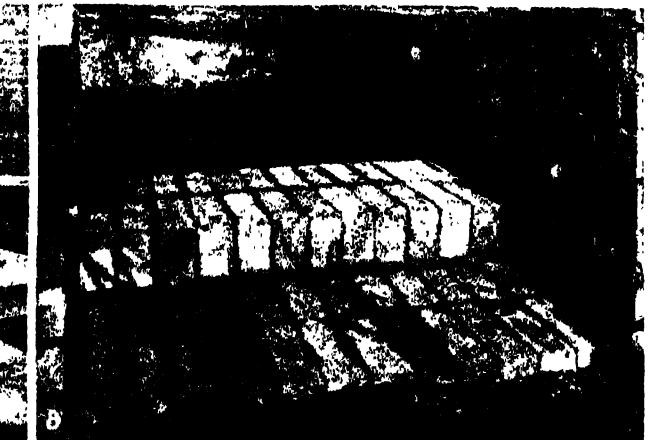
One of the simplest means is to raise the material to a high temperature at which no germ life can exist. For example, the boiling of milk is the most thorough and reliable method of destroying any germs which may be contained in it. Pasteurising is a useful method which will destroy almost all the germs likely to be found in milk. It has an advantage over boiling in that it has a less marked effect on the taste of the milk. The process consists of raising the milk to a temperature of 145° to 150° and keeping it there for not less than half an hour. See Antiseptic, Bottling; Disinfectant; Milk; Pasteurisation.

STERNBERGIA. These hardy bulbs bear yellow, crows-like flowers. They are suitable for planting in sunny places in the rock garden or at the foot of a house wall. The winter daffodil, or lily of the field (*lutea*), which blooms in September, should be planted in July, and *Fischeriana*, which is in flower in April, ought to be planted in October.

STETHOSCOPE. An instrument known by the name of stethoscope is used by doctors for listening to sounds produced within the

carrots when in season. The vegetables are first sliced and the meat cut up into neat pieces, then all should be put in layers, in a stewpan, vegetables making up both top and bottom layers. Season plentifully with salt and pepper and a little sweet herbs, if liked, and pour over it 1 pint water. Simmer for about 3 hours, shaking the pan occasionally to prevent burning. Turn out on to a dish to serve. See Beef; Irish Stew; Veal.

STEWING: In Cookery. One of the most economical methods of cooking is stewing, which consists in slow boiling in a



Making a flight of brick steps as shown in the diagram above. Fig. 5. Laying concrete foundations. Fig. 6. Laying course for lowest step. Fig. 7. How side walls are bonded together. Fig. 8. First two steps completed. Fig. 9. Heading course set on side wall and steps nearing completion.

when ripe. Certain kinds of plums stew well, also apples and a hard sort of pear.

The simplest method for stewing fruit is to put it in a stewpan with sugar and a little water, and cook it gently over the fire or in the oven until it is quite soft, and the sugar and water have thickened. The fruit must be in sound condition; before stewing it should be picked over, and all damaged portions rejected, then it should be rinsed with cold water in a colander.

The amount of sugar necessary is about the same quantity that would be required for making the fruit into a pie. Fruit must always be amply sweetened while cooking, as no amount of sugar added afterwards will avail to remove the tart taste. The quantity of water to be added also varies with the kind of fruit; for very juicy fruits the drippings of water after washing should create sufficient liquor for the stew.

A second method is to prepare a syrup, and, after heating it to boiling point, drain the fruit until no moisture is left, and turn it carefully into the syrup. About 1 gill syrup should be enough for each lb. fruit, and it must be strong, as it will be thinned considerably when the juice boils out of the fruit. Cook all until the fruit is tender, shaking the pan occasionally to prevent the contents from burning. The heat employed must only be moderate.

Another method is to lay each piece separately in the stewpan in a single layer, pour a strong syrup over it, and cook gently on top of stove or in oven, till soft. Each portion or whole fruit will then be found entire, and can be properly arranged in a dish. The syrup when cool should be ladled over and round.

Rhubarb, if possible, should be treated by this method, and will make a superior dish, especially if a little syrup from a jar of preserved ginger is added while stewing. Strawberries are not suitable for stewing by any method, although they may be heated and softened in syrup for the purpose of filling tarts and flans. The same applies to oranges, all pips and pith being removed, and also to fresh pineapples and bananas, and tinned fruits, such as cherries, peaches, pears, etc. One dessert-spoonful of lemon juice should be added to the syrup made with a 2 lb. tin of peaches or apricots. Many varieties of dried fruit are excellent when stewed, and full directions are given in page 391.

Stewpans. Except for size, stewpans are in most instances identical with ordinary saucepans, and in the average household the latter are used as substitutes. Pans used for stewing should have tightly fitting lids and the power to retain heat. Casseroles and other earthenware utensils have this latter property, and are therefore specially well adapted to this method of cookery.

Tinned copper, tinned iron, and enamel pans are also excellent for stewing, but care should be taken to see that the lining of copper pans is undamaged, otherwise poisoning may result. Double saucepans, such as those used in making porridge, are also suited to stewing, for they minimize the danger of burning. See *Reef*; *Casserole*; *Dried Fruit*; *Pressure Cooker*; *Saucepan*; *Steamer*.

Sticking Plaster. See *Adhesive Plaster*.

STIFF NECK. Muscular rheumatism, or fibrositis, may result in a stiff neck. It is more common among children than adults. Generally the stiffness is confined to one side, the muscles in front and at the side of the neck being most often affected. Persons subject to this painful affection should take the greatest possible care to avoid draughts and exposure to cold.

Usually the only treatment required is the rubbing in of some warming, stimulating liniment, and then covering warmly with a pad of cotton wool to prevent chilling. The

following are two prescriptions for liniments that are suitable for external use in cases of stiff neck:

(1)				
Camphor	..	..	..	1 part
Soft soap	..	..	..	2 parts
Water	..	..	..	10 parts
Methylated spirits	..	..	..	12 parts

(2)				
Methyl salicylate	..	..	..	2 drams
Olive oil to make	..	..	..	1 oz

See *Fibrositis*; *Rheumatism*.

STIFFNESS: Of Muscles. The painful stiffness in over-used muscles may be removed by a hot bath and sufficient massage; stiffness remaining after a night's rest is generally dissipated by brisk exercise.

Painful stiffness is a feature of muscular rheumatism or fibrositis, and here, also, heat and massage are good remedies. Stiffness and rigidity of the muscles of the abdominal wall are found when there is underlying inflammatory mischief, as, for example, appendicitis. See *Fibrositis*; *Massage*.

STILE: In Carpentry. This is the term used for the outer upright pieces of a frame into which the rails are tenoned. In cabinet and other double doors, the two inner stiles are known as meeting stiles, and the meeting edges are either rebated or one stile provided with a projecting beading to cover the space. See *Cabinet Making*; *Door*.

STILETTO: For Needlework. This is a small, sharp-pointed instrument used for piercing eyelet-holes. Stilettoes can be bought cheaply from all art needlework shops. Care should be taken to keep them free from rust. See *Eyelet*.

STILL BIRTH. When a child is born dead, the occurrence is spoken of as a still birth. It is important to remember that still births, as well as others, must be registered, accompanied by a certificate from the doctor or midwife who was in attendance at the birth or who examined the body.

Sometimes a child is born very pale or blue in the face, making no attempt to breathe or move, but with the heart beating faintly. The nurse should sprinkle the child's face and chest with cold water; this stimulates it to breathe. If that does not succeed, she should raise the child by its heels and tap its body smartly. Should this be unsuccessful, artificial respiration should immediately be practised.

STILL ROOM. In large houses there is often a housekeeper's pantry or still room, as it is called. Though apart in its uses from the butler's pantry, it is furnished in much the same way with cupboards, shelves, and sink, and there is usually a gas stove or range and large kitchen or cook's table. Where a great deal of confectionery is made in the house a special still room must often assist in this branch of cookery.

STILTON CHEESE. In the true stilton the milk with which it is made is enriched by a certain proportion of cream, added when making the curd. The cream is first scalded by a small quantity of boiling water being poured upon it. The best season for making stilton is from July to October, giving the cheese time to ripen for Christmas fare. Although the outer crust has a rough, pitted appearance, the interior is milky white with streaks of dark green.

Stilton should be cut in halves to be served, and one half sent to table with a dinner-napkin folded round it. It is never cut in slices; portions are dug out of the top with a

cheese scoop, and in the hollows which are made wine or ale should be poured. By degrees, if this process is carried out, the cheese will acquire a more matured flavour, while it will be kept sufficiently moist inside. See *Cheese*.

STIMULANT. A stimulant means a drug or agent which increases the activity of any organ or tissue, thus there are heart stimulants, brain stimulants, skin stimulants, and so on. Popularly, the word is used for something which invigorates the body, generally alcohol.

As a matter of fact, the stimulating effect of alcohol are transitory, and the main effect is narcotic. Small doses of alcohol, repeated if necessary, ought to be given instead of large ones in the treatment of collapse.

Ammonia is a good general stimulant, and may be given in the form of the aromatic spirit of sal volatile, in dose of a tea-spoonful in a wineglassful of water. Tea and coffee are also good general stimulants.

STING: How to Treat. The pain introduced by an insect sting is usually temporary. A solution of ammonia is the best remedial application, but solution of the carbonate of soda or of potassium permanganate are also useful.

Fresh tobacco ash is a simple remedy for stings. It should be applied to the affected part with moisture to form a paste, and the rubbed in gently.

A few drops of oil of geranium rubbed behind the ears and over the neck and ankle will generally afford protection against the stings of midges and other summer pests. Babies and children should be especially protected, as insect stings are not only painful, but may be dangerous when they occur on the lips or eyelids. If the oil is not rubbed on the skin, it may be used to sew small pads of cotton wool sewn to the clothing.

See *Be Sting*.

Stipa. This is the botanical name of the ornamental grass known as feather grass (*q.v.*).

STIPPLING. A flat effect is obtained with ordinary paint or distemper by the method known as stippling. The stippler used for paint is shown in Fig. 1, and Fig. 2 shows a large brush for use with distemper. Both are made from hog-hair, and after use should be washed in lukewarm water if used with distemper, or with turpentine in the case of paint.

Stippling should be done while the paint is wet. The method is to apply the paint or distemper evenly, the direction does not matter as long as the surface is evenly covered. The stippler is then dabbed on the wet surface. The surface to be stippled should not be more than 1 sq. yd. at a time. Broken surfaces require considerable care, and it is often necessary to use a small sash tool as a stippler.

It is more difficult to use the stippler in applying a flatting paint. Only the tips of the hair should be used, and the brush should be kept clean by dipping it from time to time in turpentine and cleaning it on a piece of paper. One should be careful not to drag the stippler over the surface, but to apply it with the hairs at right angles to the surface, and with a light touch. See *Brush*; *Paint*.

STIRRUP. Steel or nickel-plated stirrups are a necessary part of the rider's equipment, though not essential when learning the rudiments of horsemanship.

The use of stirrups is to assist balance and to form a support. Some riders drive their feet right home into the stirrups, but the



Fig. 1

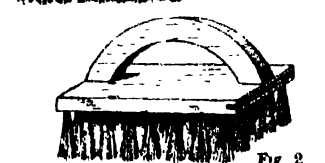


Fig. 2

Stippling. Fig. 1. Stippler for paint. Fig. 2. Larger stippler for use with distemper.

disadvantage of doing this is counterbalanced by a lighter grip with the sole about its middle. The adjustment of stirrup leathers is always a matter of prime importance. If they are too long the rider does not get the requisite support, and sore back may result. The best method is for the rider to sit in the saddle and test the length by putting his feet into the stirrups.

There is another use for the stirrup, and that is the left stirrup iron serves to receive the left foot during mounting, aided by the grip of the hands of the pommel and girth of the saddle.

Cleaning. Stirrups and stirrup leathers require cleaning after use; the former with metal polish and the latter with saddle soap. As the leathers are liable to perish with use it is necessary to examine them frequently, and replace worn portions. See Horse.

STITCH: In Needlework. Of the various kinds of stitches used in needlework, running is employed for gathering, and also for joining materials, and hemming for turning down raw edges, while tacking, which

is a temporary stitch, holds the fabric in position while the permanent stitches are put in. There are also fancy stitches, such as cross-stitch and herringbone, which are employed for decorative purposes. See Applique, Basting; Cross Stitch, Dress-making, Embroidery; Feather Stitch, Hem, Hemstitch, Herringbone; Laid Work; Needlework, Overcasting, Running, Seam, Sewing Machine, Smocking, Tapestry Needlework.

STITCH: In the Side. The sharp, stabbing pain felt sometimes at the side of the chest, and popularly referred to as a stitch in the side, may result from running or any violent exertion after a meal, or from prolonged laughing, coughing, or sneezing. It may be due in these cases to a cramp-like spasm of muscle fibres in the midriff or the chest wall, and no treatment is necessary, as the pain passes off almost at once on resting.

Sometimes, however, this form of pain is a symptom of a broken rib, or lobar pneumonia, or pleurisy or of some disorder of the liver. The application of a hot bag is a useful temporary measure.

STOCK FOR SOUPS AND SAUCES

Recipes for Clear, White, Bone and Vegetable Varieties

This article is in close connexion with those on Sauce and Soup. See also Beef, Bouquet Garni, Gravy, Mutton, Veal, etc.

The foundation of most soups, sauces, and a good many of the made up dishes is stock. Impoverished stock will make a very poor soup, and no added flavour of vegetables or herbs will successfully disguise its original weakness.

Scraps of food, trimmings of meat and bones, which would otherwise be thrown away, can be added to the stockpot and turned into useful material. Almost any oddment, provided that it is suitable to augment or clear the stock, may be added from time to time. Egg shells assist in clearing the liquor, and even hardy roots have their use in helping the scum to rise. Stock requires careful skimming when it boils up and whenever scum collects.

The more continuously the stock is allowed to simmer the better and richer it will be, but it is advisable to strain it out at night into an earthenware pan to prevent souring, especially in summer. Vegetables, particularly turnips, if left in the stockpot are liable to sour the liquor. Potatoes should not be put into the stockpot. Meat bones can be boiled again for a second and third stock, but vegetables should not be used a second time. Stock should not be left in the larder after the second day without being boiled up, and in stormy weather it should be boiled daily. A thundery condition of the atmosphere is alone sufficient to spoil the stock entirely.

If fresh meat is added to the pot, skimming must take place as soon as the scum rises, for if the scum is allowed to boil down in the liquor it will be impossible to clear it properly, and a thick and cloudy appearance will result. Never place a pan of hot stock on a slab or stone slab, or it will cool too rapidly; if obliged to set it away hot, place under the pan 2 or 3 pieces of wood to support it.

Chickens, rabbits, or meat intended to be served as a boiled dish may be cooked in the stockpot and will add to the strength of the stock, and they will be flavoured and enriched by it. Chickens should be wrapped in buttered paper or a loose cloth, which will prevent sediment or small pieces clinging to them.

Fish stock is made from fish or the bones and trimmings of fish, boiled with or without vegetables. A recipe is given in the general article on Fish.

First Stock. Clear soup is always made from first stock. This is composed of fresh meat or bones and flavoured with vegetables.

Mutton is difficult to clear on account of its fatty fat, and pork is too fat for any stock. Beef, veal, calf's head, ox tail and ox-cheek make the best first stock. Vegetable and bone stocks can also be used, but must be carefully strained, and clarified with white of egg if necessary. Peppercorns should be used for first stock, as ground pepper would make it cloudy. The salt should be added to the water when cold, as it helps the scum to rise, and care should be taken to remove the scum just as the stock is on the point of boiling, to prevent it sinking into the liquor. Before the vegetables are added all scum must be removed, and the vegetables should be put in by degrees to prevent dropping the temperature of the stock too suddenly. Never add marrow bones to stock intended for clear soup, as marrow fat cannot be entirely skimmed away.

There is no occasion for concern if stock made principally with beef does not make a strong jelly. For clear soup a meaty flavoured stock is more necessary than one which is very gelatinous, and the meaty stock will be bright as well as clear.

White Stock. White stock for white soups and sauces is always made with white meats. Knuckle of veal, carcasses of chicken, or an old hen are the most useful meats for this purpose. The flesh of the hen need not be wasted, as it can be worked up into some side dish.

The ingredients for a good white stock are a knuckle of veal weighing about 2 lb., $\frac{1}{4}$ lb.

lean ham 2 onions 2 sticks celery or $\frac{1}{4}$ teaspoonful celery salt, $\frac{1}{4}$ turnip, 18 peppercorns, 1 blade mace, bunch of herbs, 4 in. lemon rind, 2 teaspoonfuls salt, 3 quarts water.

Chop bones and meat small and put into stockpot with salt and cold water, bring to boiling point, skim carefully, then boil for three hours, skimming frequently. Add vegetables carefully cleaned and peeled and chopped small, together with the flavourings, and simmer for two hours. Strain through a hair sieve, and remove fat when cold. Use bones and meat for second and third stock.

Brown Stock. For this use 2 lb. shin beef, $\frac{1}{4}$ lb. knuckle of veal, $\frac{1}{4}$ lb. raw ham, 1 oz. dripping, 1 teaspoonful salt, 2 onions, $\frac{1}{4}$ turnip, 2 sticks celery, or $\frac{1}{4}$ teaspoonful celery salt, a bouquet garni, 2 quarts water.

Put prepared meat and bones in the stockpot with cold water and salt, bring slowly to the boil, being careful to remove all scum in the process. Simmer gently for three hours. Slice onions finely and fry in the dripping until brown. Drain well, add to stock with remainder of ingredients and simmer for two hours. Strain through a hair sieve and remove all fat when cold. Reserve meat and bones for second and third stock.

Bone Stock. A good recipe for bone stock requires the following ingredients: 4 lb. raw or cooked bones, 1 carrot, 2 onions, $\frac{1}{4}$ of a large turnip, 2 stalks celery or $\frac{1}{4}$ teaspoonful celery salt, $\frac{1}{4}$ teaspoonful salt, bouquet garni, 3 quarts water.

Chop bones small, place in stockpot with cold water and salt and bring to boiling point, skimming carefully all the time. Boil for three hours, skimming frequently. Clean and cut up vegetables, and add to stock with the herbs, boil gently for 3 hours, then strain. Remove fat when cold.

Vegetable Stock. Vegetable stock is made from mixed vegetables. To 1 quart water allow 1 lb. mixed vegetables. Carrots, turnips and onions are the most used, and, if liked, celery, tomato, leek, and a little parsley can also be added. Four peppercorns are used for seasoning, and 1 or 2 cloves can also be added. The vegetables are washed and cut into small pieces, and then fried gently in about 2 oz. fat for about 15 min. in a covered pan. The water, herbs, and a sprinkling of salt and the peppercorns are added to the vegetables, and the whole brought to the boil. The stock is then left to simmer for about 2 hours in a covered pan and strained. Variety can be given to any of these stocks by the addition of other vegetables, small piece of cooked meat, poultry, game, or macaroni, vermicelli, boiled rice, sago, or semolina.

Vegetarian stock is sometimes made by boiling bran with water for $\frac{1}{2}$ hour, then straining off the liquor and letting it settle. Oatmeal also is used for this purpose.

Straining Stock. When straining stock remember that pressure should not be resorted to if the stock is desired to be clear. The liquor should be allowed to drain until all is through, then the sieve is lifted off with the solid portions. By straining liquid stock it can be rendered free from grease, although it is usually more difficult to clear this stock from fat than that which is in a jelly. When perfectly cold pass the stock through a hair sieve or piece of muslin stretched over a basin, after removing solid fat with a broad flat knife. The hair or material will effectually retain any particles of fat, but the stock must be really cold; if merely lukewarm the fat will be liquid enough to pass through very fine meshes. Jelly stock may be cleared by the fat being taken off in a cake and the top washed with warm water.

Stockpot. Any pan or vessel reserved for the preparation of stock may be described as a stockpot. In the home, a large saucepan is



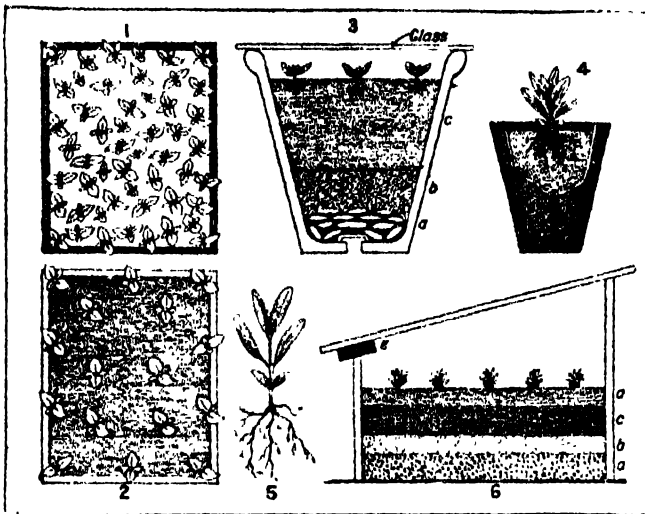
Stockpot made in aluminium. The tap allows the liquid to be drawn off quickly after the stock has been heated up.

generally reserved for this purpose, but pots specially designed for stock-making can also be bought in a variety of metals. Some of the larger kinds are fitted with taps. An example is illustrated in the opposite page, which is made in aluminium. When its contents have been heated, the tap allows the stock to be drawn off quickly.

Unless the stock-pot is of earthenware, stock should never be allowed to remain in it overnight, neither should it be left standing at the side of the fire for an indefinite time. Stockpots should be scoured and dried thoroughly immediately after they have been in use.

STOCK: The Flower. The stock is a delightful fragrant garden flower of which there are several types. By cultivating a suitable selection the plants will supply flowers during the greater part of the year. Ten week stocks are raised from seeds sown under glass in March, the seedlings being planted out of doors in May; they bloom in summer and autumn, and bear flowers in many beautiful colours. The Brompton stock is grown as a biennial, seeds being sown in June to provide plants that will flower early the following summer. If the garden soil is clayey and becomes sodden in winter it is wise to pot the plants in autumn, keep them in a frame and plant out in spring.

Intermediate stocks raised from seeds in summer are very useful for greenhouse decoration in spring. If raised in a warm greenhouse in January they will bloom out of doors in late summer and early autumn. The East Lothian is a favourite strain of the intermediate stock. Winter flowering stocks are splendid plants for the greenhouse. Seeds are sown in a frame in August. The seedlings are potted in small pots and subsequently into others 5 or 6 in. wide and brought into a slightly heated greenhouse in autumn.



Stock Cultivation. 1. Seedlings sown in box ready for transplanting. 2. Suitable transplanting. 3. Brompton stocks sown in pot; a, drainage; b, broken turves; c, fine rich soil. 4. Good type of seedling potted in small pots. 5. Type of seedling which often produces single flowers. 6. Plants pushed on in frame; a, ashes; b, decayed manure or leaf-soil; c, ordinary soil; d, fine rich loam; e, block for ventilating.

By special arrangement with Amateur Gardening

Favourite varieties are Christmas Pink, Beauty of Nice, All the Year Round, and Empress Elizabeth. The night-scented stock (*Matthiola bicornis*) is a hardy annual raised from seeds sown out of doors in April; the

flowers are very fragrant in the evening. See Night Scented Stock, Virginian Stock.

STOCK: For Trees. The named varieties of fruits and roses are invariably budded or grafted on stocks, i.e. closely related trees or shrubs. Well developed trees are obtained more quickly in this way and in some cases the growth of the tree is controlled by the stock. For instance, standard apple trees are budded on the crab stock; they come slowly to maturity, but eventually form large trees. Apples budded on the broad-leaved paradise stock make less vigorous growth and bear fruits earlier. Thus the choice of stock on which a tree is budded is one of importance.

Similarly, pear trees on the pear stock grow more vigorously and come to fruit bearing later than others on the quince stock. Those whose gardens are restricted in size should plant apple trees budded on the broad leaved paradise or other dwarfing stock and pear trees on the quince stock. Rose trees are budded chiefly on wild briar and the Japanese briar. The first named is considered the best for dwarf or bush roses, and is also used for standard roses, but, owing to the difficulty of obtaining suitable briar stems, the Japanese briar, *Rosa rugosa*, is now often used instead. Stocks for roses and fruit trees are raised by nurserymen or imported annually in large numbers. They are planted in autumn and budded the following summer.

As stocks for plums, the most popular are the Muesel, the Brompton, the St. Julien. For the cherry the most popular stocks are the mahaleb and the gean, or wild cherry.

STOCKS AND DIES FOR SCREW CUTTING

How to Form External and Internal Threads on Metal

This contribution explains the method of cutting an external screw thread by the use of a die, and also the tapping of holes. The mechanical process of screw cutting in the lathe is dealt with in an earlier article on Screw Cutting. See also Lathe; Metal Turning; Screw Plot.

In choosing stocks for screwing purposes the first consideration should be the nature of the work. For small diameter screws, a stock for use with circular dies is suitable. Such a stock would measure about 8 in. in length, and contain a circular socket or aperture for the small size die measuring $\frac{1}{2}$ in. diameter. This is suitable for screwing in brass up to $\frac{1}{2}$ in. diameter or thereabouts, and rather less on steel.

For work from about $\frac{1}{2}$ in. to $\frac{1}{2}$ in. diameter one of the engineer's type of stocks should be used, with a pair of adjustable (two part) dies. For gas-fitting purposes, larger stocks employing separate dies are generally used.

External Threads. The function of a screwing die being to cut a screw thread upon the outside of a circular piece of metal, the interior of the die is fashioned in the form of the screw thread. Parts of the diameter are cut or ground away to form a cutting edge, and the threads themselves are ground away at the front or entering edge, to facilitate starting the screw thread.

Most circular dies have a small set screw which, when screwed in, expands the die slightly and thus increases its effective diameter. Two-part dies are adjusted for diameter by means of a set screw or screws in the body of the die stock. It is important that the die be

adjusted to cut to the desired diameter. Screw it on to a clean piece of metal that has already been threaded to the proper size, then adjust the die until it is stiff to move by hand. For steel set the dies a shade closer, and for copper or aluminium a shade slacker.

Plenty of lubricating oil or soapy water should be used while cutting the threads, and the die should be worked down gradually. Give it half a dozen turns, then reverse the direction for a turn; this clears the chips, frees the dies, and often avoids stripping the threads. Do not force the die beyond its cutting powers, which can be judged by the chips coming away cleanly and freely. If the chips



Stock. Queen stock, a bushy variety with white, crimson or purple flowers.

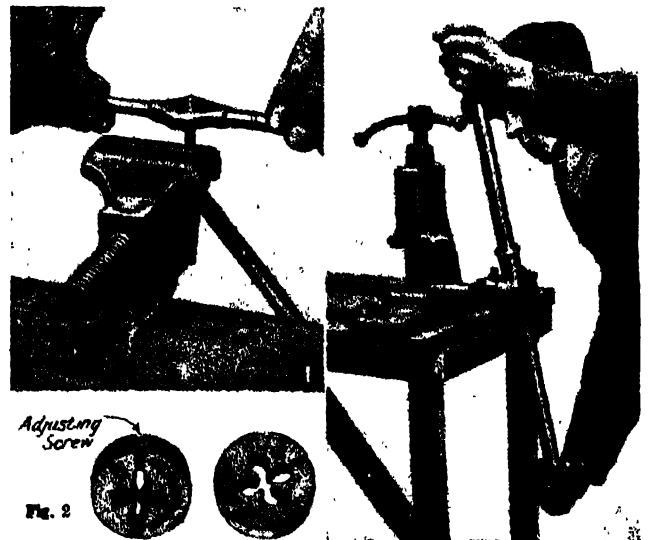


Fig. 2

Stocks and Dies. Fig. 1. Small circular die stock used in cutting a screw thread. Fig. 2. Adjustable circular die. Fig. 3. How large die is employed for screwing gas barrel.



leg and band, reverse the motion. Screw the die back from the work, clear the cutting edges by wiping away the chips and apply the lubricant freely. Proceed with the work by giving the die a half turn, and then back wards a quarter turn, and so on, gradually coaxing the die.

Internal Threads. Taps provide the simplest method of forming the screw thread in a nut, or in the end of a length of cylindrical tube. Three or four flutes or grooves are formed longitudinally on the tap cutting away portions of the screw thread. The shape of the flutes is designed so that one of its walls forms a cutting edge. The opposite end of the tap is usually left plain, and finished with a square shaped portion. The tap is turned by a lever or bar, known as a tap wrench, which may consist of a piece of metal with a square hole through it of a size to fit the square on the tap. A more convenient pattern is adjustable, having a pinching screw which clamps the shank of the tap.

The cutting part of the tap is shaped in various ways apart from the ordinary fluting. A set of taps for any particular size includes a taper, second, and plug or bottoming tap. In the case of the taper tap the screw thread portion is ground away for about $\frac{1}{2}$ of the length of the screwed part, so that it becomes tapered. In the second tap the tapering is restricted to a very slight amount at the end.

WHITWORTH		GAS		B.A.	
SIZE	DRILL	SIZE	DRILL	SIZE	DRILL
1/16	No. 35	1/16	11/32	0	9/11
1/8	No. 25	1/8	29/64	1	15/17
3/16	No. 9	3/16	19/32	2	24/25
1/4	1	1/4	47/64	3	28/29
5/16	19/64	5/16	61/64	4	31/33
3/8	11/32	3/8	1 1/8	5	36/39
7/16	27/64	7/16	1 17/32	6	42/43
1/2	23/64	1/2	1 45/64	7	45/48
	41/64	2	2 5/32	8	48/51
	47/64	2 1/2	2 25/32	9	51/54
	27/32	3	3 9/32	10	53/55

the bulk of the screwed portion being of full diameter. In the plug, or bottoming tap, no part of the thread is ground off.

Before the hole can be tapped it must be drilled out to a certain size, dependent upon that of the screw thread which is to be formed within it. Suppose, for instance, the screw which is to be inserted into the tapped hole is $\frac{1}{4}$ in. diameter. The hole will then have to be drilled out about $\frac{3}{8}$ in. diameter. The correct size of drill to use is most quickly determined with the aid of a drill and tapping gauge, an instrument consisting of a metal plate with a series of numbered holes through it. The hole marked $\frac{1}{4}$ in. (tapping size) will actually measure less than $\frac{1}{4}$ in., and denotes the correct size of drill to employ to prepare the tapping.

Gauges are generally based on the assumption that the Whitworth system of screw

thread will be used. With other systems of screw threads, such as the B.A. or British standard line, or the gas threads, the correct size to drill the hole can be ascertained from the tables of tapping sizes which are given in engineering text books. Some of those most likely



Stocks and Dies. Fig. 4. Three taps for forming the screw thread in a nut: left to right, taper, second and plug tap. Fig. 5. Showing tap rotated by hand.

to be required by the amateur are given in the accompanying table. It should be noted that in the gas thread system the sizes for the taps are based on the bore of the tube, and not the diameter, as in the case of a rod.

When the hole has been drilled through a piece of metal, the taper tap should be inserted into it, and if both are correct the end of the taper tap should just fit in the hole. The tap should be given 2 or 3 half turns to the right. It should then be turned backward a half turn and forward for 2 or 3 more half turns, then back again, and so on until the tap has nearly screwed right through the hole to its full diameter.

It is then unscrewed and the hole finished by tapping it out afresh, either with the second or the plug tap. The second is the best to use when the tap can be passed right through the hole. In the case of a blind hole—that is, one that is drilled for a certain depth into a solid piece of metal—a start has to be made with the taper tap to the maximum depth, following with the second and finishing with the plug tap. In this case the greatest care is needed to avoid breaking the tap by forcing it too harshly into the

hole, or by jamming it on the bottom of the hole. When tapping iron or steel the tap should be well lubricated with light machine oil.

It is important that the tap should be rotated about its own centre line; if allowed to swing from side to side in even the slightest degree the hole or the threaded portion will be enlarged or distorted. Special care is needed when starting the tap.

Whatever size of tap is used, the same method is followed in all cases likely to be met with by the amateur. It is exceedingly important to use a tap of the correct diameter and thread form for the screw which is to be fitted into the hole. This, however, presents very little difficulty in practice, as bolts and screws mostly used in the home, for such work as the repair of a stove, mangle, garden implements and the like, are generally screwed on the Whitworth system. Small work, such as that in wireless receiving apparatus, scientific instruments, and the like, is generally screwed on the B.A. system, as regards the small size, up to about $\frac{1}{4}$ in. Larger sizes are often cut in a lathe.

Threads used in the home for screwing iron pipe, either for gas or hot water purposes, are always screwed on one of two systems. Iron pipes are screwed with gas threads, while copper and brass pipes are usually screwed with brass gas threads. Taps and dies for this work are obtainable at most tool shops. The size of the tap wrench varies according to the size of the tap.

As taps can be purchased separately, the amateur will be well advised to buy those needed for any particular job, and gradually accumulate a stock as circumstances necessitate. To prevent them becoming rusty they should be wiped over with a greasy rag.

STOCKFISH. Large fish, such as cod or hake, were at one time extensively cured by being split open and dried in the air until very hard, no salt being used. The fish before being cooked was beaten with sticks in order to soften it. The name is now often applied to salt cod, ling, hake, etc., and is a term of commerce. See Cod; Fish.

STOCKINETTE. A wool or silk knitted fabric of elastic texture, stockinette is employed to make frocks, cardigans, and other sports wear, and underwear.

Stockinette needs the same care in laundering as other knitted materials. No wringing or rubbing should be done, the dirt being removed by squeezing the garment in warm soapy water. It should be pulled gently into shape while still damp, left to dry on a flat surface and ironed with a cool iron. When holes appear in stockinette they should be darned at once, otherwise they will form ladders.

STOCKINGS OF SEVERAL TEXTURES

With Directions for Knitting Two Standard Types

Other articles in this work that describe the various items of footwear include: Boots; Boot; Moccasin; Sock. See also Artificial Silk; Knitting; Silk; Wool.

The correct choice of stockings for women and girls depends chiefly on footwear and costume, silk or nylon being worn with light shoes, silk and wool, hosiery thread, or all wool textures being selected for sports or country wear with a heavier type of shoe.

In choosing silk stockings the hand should be run through inside from top to toe to see that the fabric is clear of flaws. Stone rings should be removed before doing this, or they may ladder the silk. Attention should also be paid to the fashioning, whether full or alight, of the leg and the width round the top. A top which is too narrow puts in an uncomfortable way, and if not full enough the stocking will split or ladder at the back seam. In some makes the heel piece runs up to a

fine point or twin points at the back of the ankle, insuring a better fit.

Stockings of a lighter shade than the shoes worn make the feet appear smaller, but they are not helpful to thick ankles. Very dark brown or gunmetal grey silk stockings have the most slimming effect. With gold and silver shoes the silk stocking should match as nearly as possible in tone. Grey shoes and stockings should match exactly. Sports stockings for winter wear are smartest when hand knit in thick silk or fine wool. Some display patterns of contrasting shade up the leg instead of ribs. Such patterns generally have a thickening effect on the ankles.

The usual sizes for women's stockings are 8 1/2 in. and 9 in. for sizes 3 and 4 in shoes, 9 1/2 in.

for sizes 5 and 6, and 10 in. for sizes 6½ and 7. Some people reinforce the toes and heels of new silk stockings by cutting out pieces of fine mesh of silk veiling to fit the required size and invisibly catching them on the wrong side of the stocking foot. Woolen stockings can be lightly darned in the same places with fine wool of the exact shade before being worn. Hand-knitted stockings can be strengthened by using a finer wool, in addition to that used for the rest of the stocking, knitting the two together for heel and toe.

No stockings can equal in durability those that are made by hand, whether they are knitted with wool, coarse or fine, or with silk. There are many patterns and styles, one of the most popular being the plainest of all.

For closer fit there are the ribbed hose which are even stronger than the plain, and are specially suitable for sports wear. By way of a standard, a plainly knit stocking has been illustrated and fully described so that when once the making is thoroughly understood others can be modelled in a different style and with slight variations in size.

Plain Knitted Stockings. To make the stocking shown in Fig. 3, 8 oz. of 4 ply fingering are required and four steel needles, No. 14. Some workers will like to rib the top of the stocking with needles No. 16, as the finer knitting affords a closer grip. The model is planned for wear with suspenders. Should garters be worn, the leg should be about 3 in. longer to allow for rolling over.

The wool must be wound very loosely, 2 or 3 fingers being taken in with every 10 or 18 windings round the ball. A quick knitter will like to have several yards of the wool pulled off the ball at once to lessen the number of unwindings.

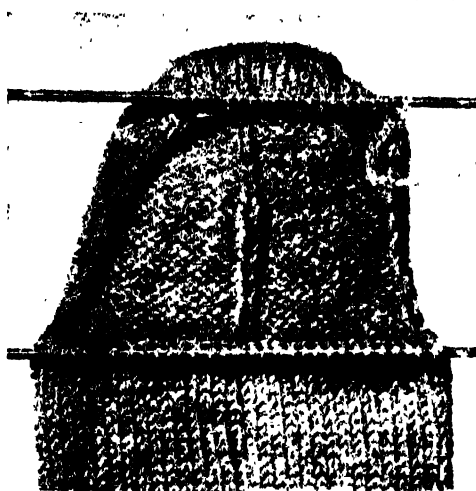
For this stocking, cast on 80, arranging 26 on one needle and 27 stitches on each of the other two needles. Make the welt by knitting 2 and purling 2 alternately all round for 30 rounds.

An excellent and durable top for a stocking to be worn with suspenders takes the form of an ornamental hem. After casting on, knit 11 plain rounds. 12th round. Make 1 by bringing the wool round the needle, knit 2 together. Work thus all round. Work 11 plain rounds. Take an extra needle and with it pick up the cast on stitches opposite those on the working needle. Fold the work so that this needle is at the back and those last knitted are in front. Knit a plain round, taking up a stitch from each needle, and work them off together as one stitch. Continue thus all round.

Take care that the stitches are exactly opposite one another, or the hem will be twisted. The 12th round forms a series of tiny scallops at the edge of the stocking. The 25th and 26th rounds are purled. For the 27th round make 1 and knit 2 together all round. Purl the 28th and 29th rounds.

Now begin the leg. In the next round raise an extra stitch in the middle, and purl this as a seam-stitch in every row till further notice. Knit plain for 80 rounds—that is, as many rounds as there were stitches cast on.

In the next round, begin to decrease to shape the calf. Knit as usual to within



Place 31 stitches on one needle, with the seam-stitch in the middle. Put 15 stitches on to each of the remaining 2 needles. Leave these stitches for the present, as later on they will be wanted for the instep. Work in rows backward and forward (purl at the back and knit in front), always slipping the first stitch of a row. When 25 rows are done, decrease exactly as in the leg, and purl back. Repeat this row twice.

Knitting the Heel. The heel is now ready to be worked off thus: Knit to the seam-stitch, knit that and the next together, knit 1. Turn, slip 1, purl 2 together, purl 1. Turn, slip 1, knit till the little hole is reached that was made by the decreasing of the preceding row, knit 2 together (the stitches on each side of the hole), knit 1. Return in the same way, putting instead of knitting. Continue thus till all the stitches are worked off.

The following direction—make an excellent heel, with rather more spring in it than the former. When the flap is finished, knit to the seam-stitch, then purl 1, knit 5, knit 2 together. Turn. Slip 1, purl 11, purl 2 together. * Turn. Slip 1, knit 11, knit 2 together. Turn. Slip 1, purl 11, purl 2 together. Repeat from * till all the stitches have been taken up.

Next, the stitches must be arranged for the instep. Pick up and draw the wool through the double loops that run down the side of the heel flap. After every third stitch increase by knitting and purling 2 in the edge of the work. When all have been picked up, slip 3 stitches on to this needle from the instep pin. Work across, and slip the last 3 stitches

3 stitches of the seam-stitch, * slip 1, knit 1, and draw the slipped stitch over it, knit 1, purl the seam-stitch, knit 1, knit 2 together, knit the rest of the round plain. Knit 8 rounds without decreasing. Repeat from * 8 times, thus reducing the number of stitches to 63. Knit 63 rounds plain for the ankle that is, as many rounds as there are stitches on the needles.

Divide the stitches ready for the heel

on to the needle with which the loops up the second edge of the heel-flap are to be picked up exactly as before. Knit with this needle to the centre of the heel where now future rounds are to be begun. Knit all round to get the stitches arranged in their places.

Shape the gussets next. At the end of the first needle, when 3 stitches are left, knit 2 together, knit 1. On the instep needle, knit 1, slip 1, knit 1, and draw the slipped stitch over, knit till 3 stitches are left, knit 2 together, knit 1. On the next foot needle, knit 1, slip 1, knit 1, and draw the slipped stitch over, knit plain to the end of the round, which is the beginning of the sole. Knit the next round, with no decreasing. Repeat these 2 rounds till 61 stitches are left. Work plain knitting for 50 rounds, counting from the end of the gusset. Some ways of finishing the foot require fewer, others more rounds for the foot according as the shapes of the toes are longer or shorter. This round toe takes up 2½ in. others are little more than ½ in. deep.

Shaping the Toe. For the toe knit 2 together to get an even number of stitches, then knit 6, knit 2 together all round. There will

be about 3 stitches left over, but these will not interfere with the look of the toe. Knit 6 plain rounds. For the next round knit 2 together and knit 5 all round. The next 5 rounds are plain. For the next round knit 2 together and knit 4. Knit 1 plain round. Continue thus, gradually lessening the number of stitches, till the round in which it is knit 2 together, knit 1. Then work 1 plain round.

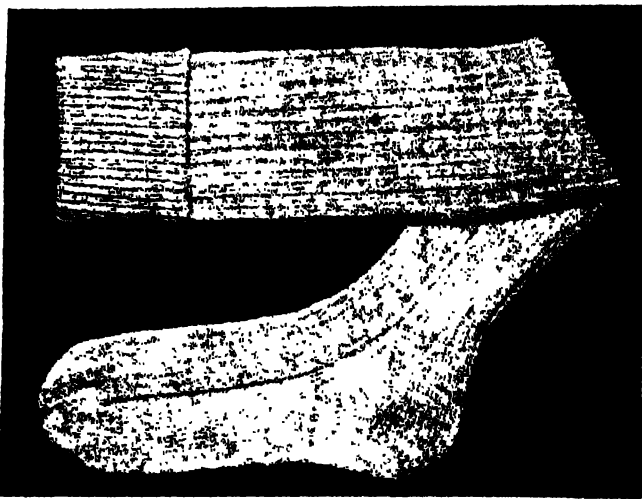
This shape of toe is most successful when joined into a circle at the tip by running a large needle threaded with the wool through the last stitches. Turn the stocking inside out, draw up the stitches closely and run the end of the wool in and out of the back of the toe till it is firmly secured. Cut it off closely.

Should a square toe be preferred, proceed as follows when the foot is finished. Take one half of the stitches on to the instep needle and divide the rest on 2 foot or sole needles. Begin on a line with the seam-stitch, which can easily be traced down from the heel. ** Knit till 3 stitches are left, knit 2 together, knit 1. On the next needle, knit 1, slip 1, knit 1, and draw the slipped stitch over, knit the remainder till 3 stitches are left, knit 2 together, knit 1. On the last needle, knit 1, slip 1, knit 1, draw the slipped stitch over and knit to the end of the needle.

Knit one plain round. Repeat from ** till about 20 stitches remain. Keep 10 of these on the one needle, and slip the other 10 on to a single needle. Close the opening by turning the stocking wrong side out, take the stitches alternately from the 2 needles with the end of wool and a rug-needle. Fasten off by darning the wool on the wrong side. If grafting is preferred, proceed thus with

stocking. Fig. 1. Turning the heel of a plain knitted stocking. Fig. 2. Joining up the toe. Fig. 3. Finished plain knitted stocking which can be used as a standard.





Stocking. Fig. 4. Pattern for a boy of 14 years. The turn-over top can also be knitted in three different colours, as shown in Fig. 5

the end of wool threaded on a large rug needle. Put the two needles together, for the front pass the needle as if to knit through the first stitch and slip it off the needles, put needles into the second stitch, as if to purl, but only draw the thread through without slipping it off. For the back purl and slip off, then put the needle into the next stitch as if to knit, but keep it on and draw the thread through. As the stitches are slipped on to the wool, draw this up closely, to make the seam invisible.

When finished the woollen stockings should be laid wrong side out on an ironing board covered with a thick blanket. A damp cloth should be spread over them, and pressed with a moderately hot iron till dry. The stockings will then look like well-finished woven hosiery.

Boys' Stockings. A popular type of stockings for men and boys are those with turn-over tops. A pair of ribbed stockings of this kind suitable for a boy of 10 to 14 years of age can be knitted from the following directions. These include a turn-over top in three colours, as shown in Fig. 5, as well as a turn over in a different ribbing from the stocking, but in the same colour of wool, as in Fig. 4.

The stocking measures 24½ in. from the top to the bottom of the heel flap, including 3½ in. on the turn-over. The foot is 9 in. long from the back of the heel to the point of the toe, but the length of the latter can be varied in the centre of the foot before shaping the toe. The length of the leg can be altered in two places, either between the welt and the first decrease, or between the last decrease and the heel flap. The materials required to knit a pair are 6 oz. of 4-ply White Heather Scotch fingering wool in grey, with a set of 4 No. 12 steel knitting needles. For the 3-colour top 1 oz. of Lovat mixture and 1 oz. of green or cardinal wool will be required as well as the grey.

To begin the work cast 26 stitches on each of 2 needles and 28 on the 3rd needle, to make 80 stitches in the round, and if making the turn-over in one colour do 3½ in. of single rib, that is, knitting and purling a stitch alternately all round. For the 3-colour turn-over begin with the grey wool, cast on the same number of stitches, and work 12 rounds in rib of knit 4 and purl 4 alternately. Here take the Lovat mixture, and, leaving the grey wool hanging, work 2 rounds in the new wool.

In the next round do 2 stitches in grey and 2 stitches in Lovat mixture, letting the wool not in use pass behind loosely so as not to contract the work. Work another round the same as last round, keeping the respective colours over each other so that a dark square is formed, then work 2 more plain rounds of Lovat mixture. Take the cardinal wool, and work 1 plain round, then 1 grey round,

2 cardinal, 1 grey, and 1 cardinal, and fasten off the latter colour. From this point 3 rows of cheek are worked in grey and Lovat mixture.

For the 1st row of cheeks do 4 stitches in one colour and 4 stitches in the second colour alternately. Do 3 more rounds as the last one. For the next 4 rows reverse the colours, then do 4 more rounds as the 1st 4. Join on the cardinal wool again and do 1 plain round, then 1 grey, 2 cardinal, 1 grey, and 1 cardinal. Fasten off the cardinal securely, as this is not required again, and complete the turn-over with 2 rounds of Lovat mixture. Fasten off the latter

colour and resume with the grey for the rest of the stocking.

Now turn this top inside out so that when the stocking is completed the right side of the turn-over will be uppermost.

Knit the next round plain, as this will form the turning-edge of the top, and in that round increase 7 stitches by knitting in the front and back of a stitch at equal distances in the round to make 87 stitches. Having fewer stitches on the stocking top will give a firm grip and keep the stocking in place.

Decreasing the Leg. The stitches should now be arranged 30 on each of 2 needles and 27 on the 3rd, so that each needle ends with a completed rib, as the rib continues in the pattern of knit 2 and purl 1 alternately all round. Continue in this pattern for 14½ in. from the 1st round, when the work will be long enough to begin the leg decreases, thus: * knit the 1st 2 stitches together, continue in the rib up to within 3 stitches of the end of the round, then knit 2 together through the back of the stitches, and purl the last stitch. Knit 6 rounds without shaping, but taking care to keep the continuity of the rib after the decreasing. Repeat from * until 9 stitches are decreased at each side and 18 stitches less in the round.

Continue ribbing on these stitches until the stocking measures 21½ in. from the top.

counting the turn over. This brings the work to the top of the heel-flap, so more rounds can be worked here for a longer stocking before beginning the heel. In the last round knit together the last 2 stitches.

To work the heel knit the first 17 stitches of the round on to one needle, slip the last 17 stitches of the same round on to the other end of the same needle, making 34 stitches for the heel. Divide the other stitches equally on 2 needles, and leave them for the instep. On the heel stitches purl and knit a row alternately until 33 more rows are worked, always slipping the first stitch; the last row will be a purl row.

To turn the heel knit 20, knit 2 together, turn. Always slip the 1st stitch after the turn. Purl 7, purl 2 together, turn; knit 8, knit 2 together, turn; purl 9, purl 2 together, turn. Knit 10, knit 2 together, turn. Continue in this manner until all the heel stitches are knitted on to one row again, then knit back 10 stitches and leave the heel stitches on 2 needles. Slip all the instep stitches on one needle, so releasing one as a working needle.

For the 1st needle knit the remaining 10 stitches of the heel, and knit up 17 stitches at the side of the heel. For the 2nd needle knit the instep stitches, and on the 3rd needle pick up and knit 17 stitches on the other side of the heel and the remaining 10 heel stitches. Knit one round plain, then decrease for the instep in the next round thus: Knit to the last 3 stitches of the 1st needle, knit 2 together, knit 1. Knit the 2nd needle without shaping. On the third needle, knit 1, knit 2 together, through the back of the loops, knit to the end of the needle. Repeat the last 2 rounds until only 17 stitches remain on each of the 1st and 3rd needles, working the rib pattern on the 2nd needle only.

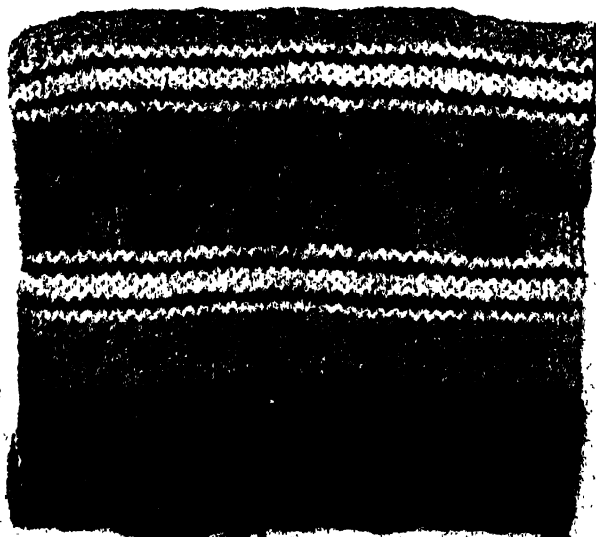
After the instep shaping is finished, work one more round, increasing 2 stitches on the 2nd needle to bring the stitches up to 70. Then continue on these stitches, ribbing only the 2nd needle, for 58 rounds, or until the toe is reached. The heel, sole, and toe will be in plain knitting. Extra rounds can be worked here before shaping the toe if a longer foot be desired, allowing for nearly 2 in. more to finish the toe.

The toe proceeds in plain knitting, and in the 1st round the 9th and 10th stitches are knitted together, then 2 rounds are worked without any decreasing, and these 2 plain rounds are worked after every decrease round. In the 4th round knit every 8th and 9th stitch

together; in the 7th round every 7th and 8th stitch; in the 10th round, every 6th and 7th stitch; in the 13th round, every 5th and 6th stitch; in the 16th round, every 4th and 5th stitch.

Run a double thread through all the remaining stitches, and darn in the end very securely. An alternative method for finishing a toe is by the process known as grafting.

STOKESIA. This is a hardy perennial, 18 in. high, with large aster-like blue flowers in late summer. It should be planted in well-drained or light soil on a sunny border. Propagation of stokesia is by division in spring or by seeds in the spring or summer.



Stocking. Fig. 5. Turn-over top for a boy's stocking, which can be knitted in three different colours by following the directions in the text

STOLE. To make a fur scarf or stole from several skins, first arrange the latter so that all the fur lies in one direction, and number each skin in order on the back before starting to join them. The careful matching of the skins, not only in colour, but also in both texture and length of fur, is most important.

Having matched the skins, cut a paper pattern as large as the largest oblong that can be contrived from the smallest of the pelts. Cut them all out by that, placing each pelt fur downward on a deal table and marking round the pattern in pencil or ink upon the leather side before proceeding to cut through the lines. Holding the skin taut between the fingers, cut it with a very sharp penknife. To join them, place the cut edges back to back, fur inside, and threading a special 3-sided fur-sewing needle with stout No. 30 cotton, overcast them together, firmly and strongly enough to hold the skins side by side, but not so closely or tightly as to draw the cut edges up into a ridge. In sewing smooth the fur down and away from the cut edges which are being joined by means of passing the needle between them.

When the skins have all been joined line the stole with silk or satin or brocade that matches or tones with the fur, with or without an interlining of doucet or flannel, or a thin layer of wadding. Any interlining should reach barely to the edges of the fur, while the lining proper should be cut at least 1 in. wider all round, to allow for a good turning. The interlining should be attached with a few invisible stitches to the fur, before starting to line it.

STOMACH. The shape of the stomach varies according to the degree of distension, but is somewhat like a pear, with the large end to the left just below the heart. Hence, when the stomach is distended by gases in indigestion, the action of the heart is often interfered with, and there may be difficulty in breathing.

The capacity of the stomach in an adult is roughly from 3 to 5 pints. In the feeding of children it is important to know how much the infantile stomach can comfortably hold. At birth the quantity is very small, and even when at the age of 12 months a child will be made uncomfortable if it gets more than $\frac{1}{2}$ pint of milk at one time.

The duty of the stomach is to digest protein matter and to help in pulping the starchy material of bread and vegetables. It contains a variety of glands, which manufacture pepsin, the ferment which digests meat, eggs, cheese, etc.; a fluid that clots milk immediately it is swallowed; and hydrochloric acid. This last substance serves to prevent fermentation of the food, and is necessary for the action of the pepsin. The muscles keep the stomach in constant movement after a meal so as to churn up the food and mix it with the digestive juices. When the mass is ready for discharge into the intestine, the muscular wall contracts and forces it through the communicating valve in little spurts, repeated until the whole meal is passed through. The spasm of dyspepsia is a violent contraction of these stomach muscles.

Diseases of the Stomach One of the commonest of the disorders and diseases of the stomach is atony, or loss of power in the muscular wall. The food remains too long and fermentation occurs, causing flatulence.

Inflammation of the stomach lining, or gastritis, and gastric ulcer are treated under their own headings.

Cancer of the stomach occurs mostly between the ages of 40 and 70, and is sometimes preceded by a chronic ulcer. It has been pointed out that its most frequent site is the spot likely to be affected by hot liquids, and by alcohol when this is swallowed raw.

The size of the stomach is increased by dilatation, which in an acute form may come

on suddenly with a troublesome hicough. Chronic dilatation is of two kinds. In one the outflow of the stomach's contents is obstructed; the cause of the other is atony, often the result of eating very large meals or drinking a great deal of fluid habitually, such as beer. The chief symptoms are flatulence, constipation, vomiting, sleeplessness, and occasionally cramp in the calf of the leg. In the atonic cases rest in bed improves the condition, but the cure is slow. Efforts should be made to improve the general health and so restore the tone of the stomach muscles. In the cases arising from obstruction an operation is necessary for complete relief. See Acidity; Digestion; Gastric Ulcer; Gastritis; Indigestion.

STOMATITIS. Inflammation of the mouth, or stomatitis, is of several varieties. Simple stomatitis may arise from smoking hot tobacco, drinking raw spirits, and other causes. Aphthous stomatitis, in which small white blisters form, chiefly attacks ill-fed children.

In thrush patches of white membrane form on the soft palate, tongue, and elsewhere in the mouth. In the ulcerative form sores form on the gums about the teeth. Gangrenous stomatitis is practically limited to children who are under-fed and live in squalor.

The diet must be confined to bland liquids, which must not be given hot. Keep the mouth clean by washing it out with solution of boracic, potassium chlorate, etc.

STONE AS A BUILDING MATERIAL

Durability and Grace in Domestic Architecture

Related information will be found under such headings as Crazy Paving, Steps, Sandial; Wall. See also Building; Concrete; House; Path; Paving; and other entries that deal with constructional matters.

The stones used in building are sandstone, limestone, slate, and granite. All stones are porous, some to such an extent as to render them unfit for domestic purposes. A very porous stone absorbs much rainwater, especially when the face of the building is exposed to the prevailing wind and weather. Granites should not absorb much more than about 1 per cent. of their volume of water, limestones 17, and sandstone 10, after 24 hours' immersion. The weight of the stone has also to be considered. Heavy stones may be used for buttresses or quoins, but lighter stones are required for vaulting and similar work.

In selecting stone for building, the colour is often attractive, but some highly coloured stones are not so durable as those of a duller colour. The best stones are those which are free from bands or spots of colour, and are of a uniform colour in structure. This, of course, does not apply to marble. Stone when freshly quarried contains a certain quantity of moisture, known as quarry sap. The stone is preferably cut to size and shape as soon as possible after quarrying, as it is more easily worked, but it is then set aside to season,

gaining considerably in hardness and stability. Artificial stone is a term applied to slabs of concrete, with differing forms of aggregate, often sold under proprietary names.

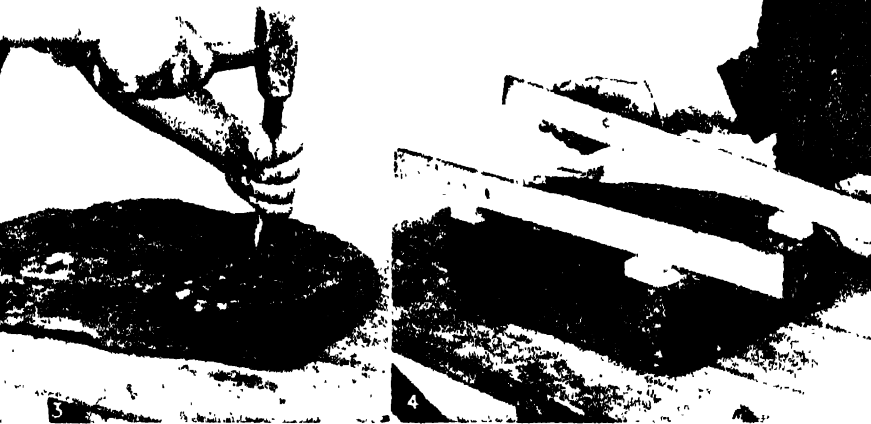
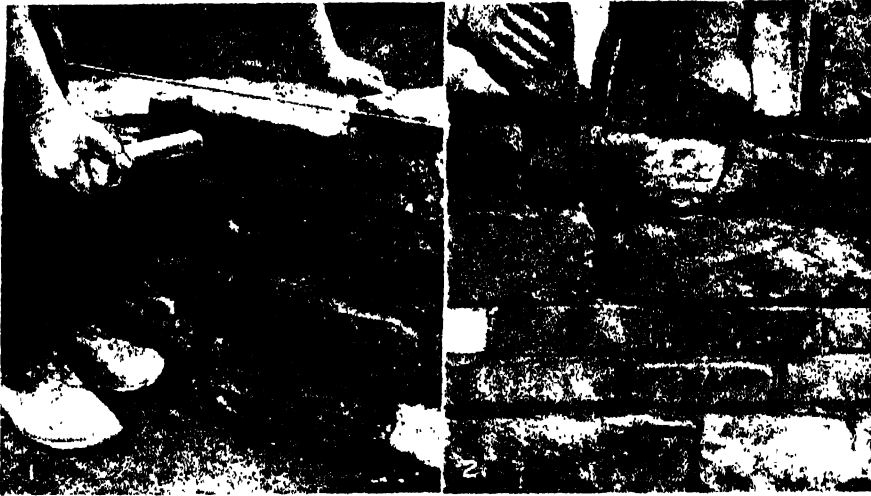
The stone employed in building work may be one of the many freestones that can be tooled readily, but generally the choice is governed by the material available locally. On this material will depend to a great extent the style of the work and the nature of the ornament. For example, in certain districts a soft and easily worked stone is associated with fine tracery and delicate carving, whereas a hard and intractable stone is available the nature of the building is quite different. When a coarse sandstone has to be used, the mouldings are bold and large, but on granite the style is broad and simple.

In the article on Loggia, p. 732, is illustrated the stone built loggia of a Wiltshire house. This is carried out in local stone. We show in this and the following pages other pictures of typical stonework, indicating different methods of surface finishing.

The amateur constructor should ascertain the kind of stone available in his district, the



Stone. Beautiful 17th century stone-built house at Broadway, Worcestershire, showing the steep gabled roof and mullioned windows which are typical features of the Tudor style of architecture.



Stone. Fig. 1. Random rubble wall set without mortar. Fig. 2. Rubble walling with facing course of brickwork and top finished with vertical stones. Fig. 3. Cutting a groove before severing a stone. Fig. 4. Preparatory levelling of a block of sandstone. Fig. 5. Simple test for chisel drafting.

cost of transport, and the amount of work that will have to be expended on the stone before they are fit to use. Some of the extensively used grades of stone are stocked by merchants, such as York stone for paving, and some of the West of England stone for general work in rock gardens and the like, otherwise the supplies have to come direct from a stone quarry. Should it have to be drawn by road, the cost per ton, inclusive of handling, should be agreed at the outset with a contractor equipped for the work.

As turned out by a country quarry the stone is split into thin slabs or sawn to shape in pieces suitable for building. It is possible to obtain stone in a rough form, comparatively small in size, but thick and solid, such being suitable as regards size for walls and constructional work of an elementary character. Thinner pieces generally of larger size are used for paving purposes, and also for some walls and roofs, and the stone can also be obtained cut to any reasonable shape and size.

York stone is largely used for crazy paving in pieces about 2 in. thick and of random shape. It is quite admirable for paths, steps, and the floors of outbuildings. When the material is delivered, the best plan is to sort out roughly those pieces which have at least one edge straight or nearly so, and to set these pieces aside for the edges of the steps or for other similar work.

Methods of Walling. The chief structural difference between one class of stonework and another lies in the arrangement of the stones, which is known as walling. This is either carried out in courses like brickwork, or

in a more or less indefinite manner known as random rubble. Walls of rubble are built of thinly bedded stones of irregular shape, generally 9 in. deep or less. Varieties of rubble include coursed and squared rubble. Block stone masonry is composed of squared blocks set in regular courses, or random formed of different shaped blocks.

The easiest walls for a novice to build are those of random rubble set dry, as seen in Fig. 1, where the wall is composed of substantial blocks of rough stone set without mortar. The foundations may be of concrete, or a course of stout stones set with the greatest width across the wall and bedded to the solid earth. For the sake of security two courses breaking joint should be employed, and the walls erected upon them. The stones are roughly selected for height and width, and arranged to fit into each other as tightly as possible. They are kept in line by setting them by a cord stretched from end to end of the wall. The top is finished with stout stones set upright, and often bedded on earth to keep out rainwater.

Another type of wall consists of several courses of stonework and then a few courses of brick, as shown in Fig. 2, finishing with other stones and upright pieces on the top

The facing course of bricks adds longitudinal and transverse strength to the wall. When this is done, the stones are preferably set in mortar, and the wall is often composed of smaller stones worked with the smoothest and straightest faces set outward. The spaces between the two sets of stones are filled in with small pieces and grouted with mortar.

Another method, particularly applicable to buildings, is to set rubble stones in front of a backing wall of brickwork. This has the effect of providing a smooth and durable inner face. Each course is set in mortar, and the stones are arranged to break joint. Usually only the face stones are set in mortar, the spaces between the irregular stones and the brickwork being filled in with hearting or small stones, and grouted in with liquid mortar poured from a pail. The mortar should not be allowed to run on to the face of the stones.

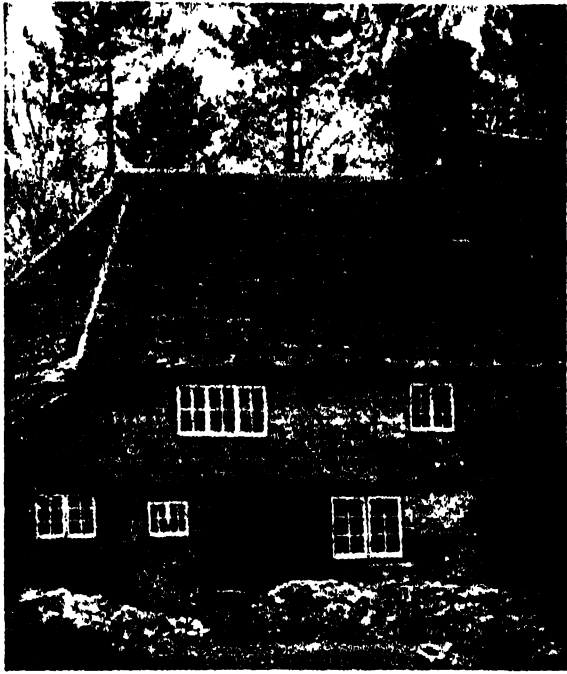
All the foregoing wallings can be put up by the amateur if reasonable care be taken to bed the stones well and to work a border or through stone about every yard square of the wall surface. The border is a stone of sufficient proportions to pass through the wall from face to face, and act as a stiffener to tie the whole together.

Cutting Stone. The preparation of bonders will probably necessitate cutting the stone, which is by no means easy until the knack has been acquired. One way is to score a shallow groove along all four faces of the stone by chipping a line with a cold chisel and hammer, as shown in Fig. 3, afterwards striking it a few blows with the mallet, delivering the blows through a board set vertically over the groove. A stone severed in this way would be sufficiently smooth and straight for random rubble work. The working or tooling of stone and the arts of the mason are hardly to be acquired by the amateur, but a few simple exercises in trying a stone will aid in the completion of such work as the cutting and shaping of cap-stones for walls, etc.

In order to produce a flat surface on a block of soft sandstone, the method shown in Figs. 4 and 5 may be followed. The first step is to cut the stone roughly to shape and size, and to select the flattest surface or bed. The corners of this part of the stone are chipped away with a chisel

to form two flat surfaces at the front side, one such place is formed similarly at the back. Blocks of wood of uniform height are placed on the front flats and a batten rested on them. The purpose is to raise the batten above the level of the rough parts of the stone. A block is also placed on the one flat at the back, and another on the untouched back corner. The second batten, as shown in Fig. 4, is rested on the blocks at the back, and the last corner is cut away as much as necessary until the tops of both battens appear level or parallel when viewed by looking across them. The same test is applied after the front and back edges of the block have been chiselled in order to make them level (Fig. 5).

There are thus two level surfaces along the front and back edges respectively, which are known as chisel drafts. The intermediate stone between these drafts may be cut away with the chisel and hammer, or the stone may be finished with chisel-drafted margins. The method is applied to the preparation of



Stone. Fig. 6. Part of an old Sussex house with a picturesque roof consisting of thin slabs of Horsham stone

capstones for the top of a low garden wall. Capstones may be used for decorative effect as well as for protection of the brickwork or other walling material, such capstones being set preferably in cement mortar.

When stone is used for building purposes the walls have to be much thicker than they would be if made of brickwork, and, unless built in random rubble set in mortar, will have to be well fitted together, and secured where necessary by means of dowels, cramps, or other fasteners.

Stone has been largely used for roofing purposes, and a roof covered with Horsham shale is illustrated in Fig. 6. This is a thin stone of

good weathering qualities, and is set on massive oak roof rafters. The stones are laid in random courses, decreasing in size from the eaves upward. The slabs are hung on oak pegs driven into holes in the head or narrow part of the stones. In modern work the stones are often set on a boarded and felted roof covering, and secured with brass nails or screws. Another plan is to cover the rafters with expanded metal lathing, covering this with a bed of mortar, setting the stones thereon and pointing the joints as the work proceeds.

Any attempt at rigid regularity of shape robs the stone roof of much of its charm. Roughness and unevenness in the stones also assists the drying out of moisture, which is important, as any dampness in the roof, by admitting frost, accelerates splitting of the stones. The valleys are generally swept, and the ridges finished with a half-round ridge tile or by sawn stones. A hipped roof is rare, and calls for great skill in cutting and fitting the stones.

STONE: The Weight. This measure of weight consists of 14 lb. avoirdupois, although there are stones of other kinds. The Smithfield stone for dead meat is only 8 lb.; that of wool is 24 lb., and of hay 22 lb. See Avoirdupois Weight.

Stone: The Disease. See Calculus; Gall Stone.

STONECROP. These hardy flowering plants are chiefly suitable for the rock garden and the wall. One, however, the Japanese stoncrop (*Sedum spectabile*), is a valuable border plant, 15 in. high, with grey succulent leaves and large flat bunches of carmine-rose blooms in September which attract the butterflies and bees. It thrives in ordinary border soil, and is easily increased by division in spring. Low growing stoncrops suitable for the rock garden flourish in sunny places in soil with which sand and old mortar rubble have been mixed.

They are increased by division in early autumn or spring. The common yellow stoncrop is *Sedum acre*; it is a creeping plant with yellow flowers in summer. Choicer kinds are *Ewersii*, rose purple; *kamtschaticum*, yellow; *lydium*, pink; *middendorffianum*, yellow, and *spatulacolum*, yellow.

STONE MARTEN. This fine fur is obtained from a species of marten (a genus of carnivorous mammals of the weasel tribe) which derives its name from its liking for rocky places. The best skins come from Asia, and are of a soft, fine texture, the underfur being almost white and the tips resembling sable in colour. In some respects stone marten bears a great likeness to the latter fur, and is sometimes dyed to imitate it. It has the advantage of being both hard-wearing and attractive. See Fur; Marten.

STONEWARE. This term is used for a certain kind of pottery. It is less fine than chinaware and is widely used for domestic crockery. Stoneware was first made in Germany, and later in England where certain districts, e.g. Staffordshire, earned a reputation for it. After a period of decay its manufacture was revived, chiefly by the firm of Doulton, whose artistic stoneware was a notable contribution to English pottery. See China; Doulton Ware; Nottingham Stoneware; Pottery.

STONING: Of Fruit. Many varieties of stone fruit when made into jam or marmalade are stoned. To do this the fruit should be split in half and the stone removed without tearing the fruit. Special cherry stoning devices for domestic use can now be obtained, which may also be used for olives and damsons. The seeds of raisins should be extracted before this fruit is added to puddings or cakes. When large quantities are to be stoned the operation is done by means of a



Stone. Circular window, an interesting combination of tooled stone with rock-faced stonework

machine, but for smaller numbers the seeds are removed by hand.

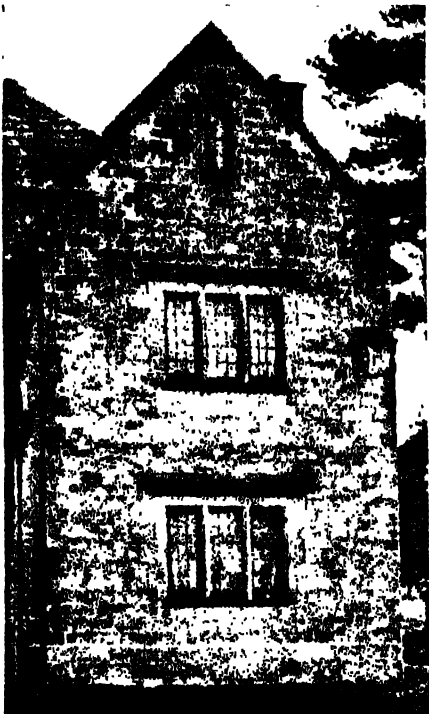
It is well to have a small basin of warm water on the table when starting to stone raisins, but recourse should be had to this as little as possible, as the added moisture detracts from the flavour and richness of the fruit. To stone, split the raisin in half lengthways with a sharp cook's knife, but do not actually divide it. By pressing the knife against the stones which are exposed they will rise, and can be removed without wasting the pulp. If the fingers become sticky, dip them lightly in the water and wipe them on a damp dish cloth before again commencing operations.

When using sections of oranges for jellies or pastries the seeds should be removed. This is best done by feeling for the pip and pressing it out with a quill, in order to avoid injuring the appearance of the fruit or allowing the escape of the juice.

STOOL. A stool is almost the oldest form of seat. Early examples are of the milkmaid's stool type on three legs, but in the 16th century they were made with four, and a certain amount of decoration was introduced into the simple design. Sometimes they possessed a box seat with hinged top. In



Stool. Walnut stool with carved cabriole legs and splay feet, covered with woolwork. Early 18th century. By permission of the Director, Victoria & Albert Museum, South Kensington



Stone. Wing of stone-built house showing both tooled and rough surfaces. Windows are stone mullioned and gables finished with sawn coping stones

the late 17th century they were upholstered, but about the same time they began to lose popularity owing to the greater comfort afforded by the chair. Specimens, however, continued to be made, and the legs of these were cabriole, and showed the carved knees and the claw lion's paw and claw and ball terminations of the period. Queen Anne stools were often covered with petit-point embroidery. An example of one with a tapestry needlework covering is illustrated in the previous page.

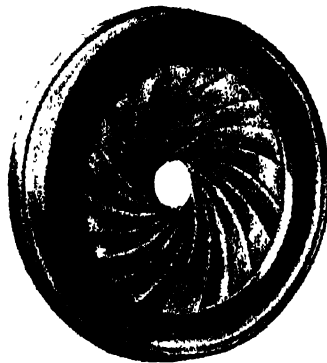
The stool most valued by collectors is one of the joint stools, as they are called, of the 16th century. They are of oak and rest on four legs, which are joined together by stretchers. The legs are turned, and in some examples there is carving on the sides of the seat. Many of them are inlaid with box and ebony in alternating triangular pieces placed in the rails just below the seat. See Camp Stool; Chair; Dressing Table; Jacobean Style, etc.

STOOL OF REPENTANCE. To play this round game one person is sent out of the room and the others then decide what shall be said about him or her, these criticisms being noted down by the leader. A stool is set for him in the centre of the players, and he is called in to occupy it. When he is seated the game proceeds.

The leader reads out each criticism in turn, thus: "Somebody says you are irritable, or conceited, or good-natured, and the victim has to guess the name of the critic. If he guesses a sufficient number correctly he is released from the stool of repentance and allowed to take his place in the circle, while another player goes out to endure the ordeal, but as the game would cease to be amusing if the same person were dealt with twice running, he is usually considered to have earned his release whether he guesses correctly or whether he does not. See Children's Party.

STOP: In a Camera. The amount of light which passes through the lens of a camera is controlled by a stop or diaphragm placed behind a single lens or between the components of a compound lens. On the size of the stop used depend both the length of the exposure required and the degree to which sharp definition of detail can be obtained throughout the picture.

The most usual form of diaphragm or stop in the modern camera, known as the iris diaphragm, consists of a series of thin metal tongues working on points in a ring in the lens mount. Each tongue has a curved slot cut in it, so that as the ring is rotated the metal tongues move uniformly towards or from the



Stop. Iris diaphragm, for controlling light passing through a camera lens

centre, making an adjustable circular aperture as seen in the photograph. The apertures at which the stop or diaphragm works are indicated on the lens mount and are known as F numbers.

The larger the stop which can be used with any particular lens the shorter the exposure, while the smaller the stop the greater is the effective depth of focus of the lens, and the sharpness of detail. The process of using a smaller stop, which is known as stopping down, is used far too frequently by the amateur photographer. In doing so, he not only lengthens the exposure unnecessarily and thereby destroys the principal quality which makes a lens both good and expensive, but also produces photographs that are lacking in artistic quality.

The whole tendency in modern photography, and this is particularly the case in landscape,

figure study, and portrait work, is so to increase the aperture of the lens, and therefore the size of the stop which may be used with it, as to shorten more and more the period of exposure while producing softer and more artistic photographs in which the different planes of vision are separated.

Many of the better quality modern roll film cameras are fitted with 1.45 lenses, and full advantage should be taken of the opportunities they offer. It is chiefly a matter of knowing what stops to use and when to use them.

The amateur should not be misled by instructions which he may find on inexpensive fixed focus cameras as to using different stops for different subjects. These instructions are a necessary compromise, due to the lack of focussing adjustment, and also to the fact that the shutter has only one speed. With a fixed-focus, single-speed shutter camera it will be necessary to stop down to get foreground subjects into focus (since stopping down deepens the field of focus), and also to cut down the light passing through the lens when shorter exposures are required, since the shutter speed cannot be increased.

The larger the aperture of the lens the shallower is the field of focus. This means that while objects in the foreground may be sharply defined those in the middle distance will be softened, while those in the background may be so far out of focus as to be unrecognizable. This gives the photographer considerable opportunities for artistic work, especially when differential focussing is employed by which the object that is of principal importance in the picture is more sharply defined.

For portraits and similar studies the largest stop available should be used, but with landscapes, which include a wide field of view, a medium stop, such as f.8 or f.8, may be required. At the other extreme the smallest stops are required when copying prints or in photographing specific objects such as turbot.

The effect of using different stops is best studied carefully on the focussing screen before rather than after exposure.

For this purpose it is essential that the screen should be well shaded. In general it may be said that the proper use of lens stops indicates the skill of the photographer. Always bear in mind that the exposure varies according to the square of the stop used, f.11 requiring twice the exposure of f.8, and f.16 four times. See Camera; F-Number; Focus; Lens.

STOP COCK. In its most general application a stop cock is any principal tap used to cut off the supply of liquids or gas to a building or to some section thereof. In the home the term is restricted to the main water or gas tap that is fitted in the run of the main supply pipe.

The water company generally fits a stop cock of substantial pattern at the nearest point to the main water pipe where the branch is taken to the building, and generally it is operated by a long-handled metal rod or key. It is an advantage to have another stop cock fitted inside the house on the rising main, e.g. beneath the sink in the kitchen. See Pipe.

STORAGE BATTERY. This is an appliance which acts as a reservoir for electrical energy. Usually it consists of a series of cells or accumulators, and is intended to yield a higher voltage or greater volume of energy than is feasible from a small portable accumulator.

For house-lighting purposes the units are usually fitted with open-top glass cells, and,

instead of having the ordinary type of terminals, the lugs terminate with a bolt and nut, and are connected by means of lead strips which are bolted to the lugs on the plates. The cells are usually arranged on a wooden stand so as to raise them from the ground and permit of inspection and necessary attention.

Any unit or cell composing a storage battery holds nominally not more than 2 volts. Actually, however, this figure rises slightly when the cells are fully charged, and may drop slightly below 2 volts when they are almost discharged. Consequently, if it is required to provide a nominal voltage of 25 volts, it is necessary to have at least 13 and preferably 14 cells, with some means of controlling the voltage, such as by a resistance or by temporarily disconnecting one of the end cells. In other words, to find the number of cells required the voltage is divided by two and one extra cell added to the total.

In arranging for the erection of a storage battery it is desirable to choose a cool, dry place, well ventilated, and situated where the fumes given off by the cells cannot affect the surroundings. A small brick-built outbuilding with a ventilated roof, and used only for the storage battery, is the best, but if the battery has to be housed indoors it should be located away from the foodstuffs and as far from the living-rooms as possible. It must be partitioned off from the rest of the room and provided with some independent and direct ventilation to the open air.

Charging and maintenance instructions are issued by the makers of the battery, and the information contained therein should be carefully followed. See Accumulator.

STORAX. The white-flowered, deciduous and hardy shrub storax requires a dry position in light ordinary soil, preferably under the shelter of a south wall. It is worth some attention, and will benefit by incorporation of peat in its root run. The most suitable planting period is from October to February. It is propagated by layering or shoots. Two good species are japonica and obassia, natives of Japan.

STORE ROOM. In some larger households, the accommodation provided for holding food stores, etc., in the larder, kitchen and pantry is supplemented by a special store room.

This room should have a north or eastern aspect, and the nearer it is to the kitchen the better. It is essential that it should be thoroughly dry and airy, and have at least one window covered with perforated zinc or wire gauze, the walls and ceilings being whitewashed or coated with sanitary paint. The floor can be left with plain, well-scoured boards or covered with linoleum. Every little crack in flooring or walls should be carefully filled to prevent the entrance of mice, beetles or other vermin.

The store room must be well fitted with shelves, preferably of graduated sizes. If all are very wide, there will be a tendency to pack each with several rows of articles instead of a single row, and so small objects may easily be hidden behind large ones and overlooked. Each shelf should be neatly covered with oilcloth held in position by drawing-pins. The stores must be grouped according to their character, i.e. all the jams together, all the seasonings in another group, different kinds of sugar together, etc. Cereals are best kept on one shelf, each stored in a separate tin. There should be a few shelves set apart for soaps and cleansing materials, not too near foods such as flour. Soap can be kept in bulk, as it hardens with keeping and is thus rendered more economical. Certain stores such as chocolate, coffee, etc., impart their flavour to other foods, and therefore should be stored in airtight tins. Tea also

tends to lose its aroma unless kept in an airtight container.

A pencil and writing tablet should be kept hanging in the store room, for noting down any supplies that need replenishing. If preferred, a store indicator can be bought for a few shillings. This gives a printed list of stores and has a system of removable pegs to indicate which are needed.

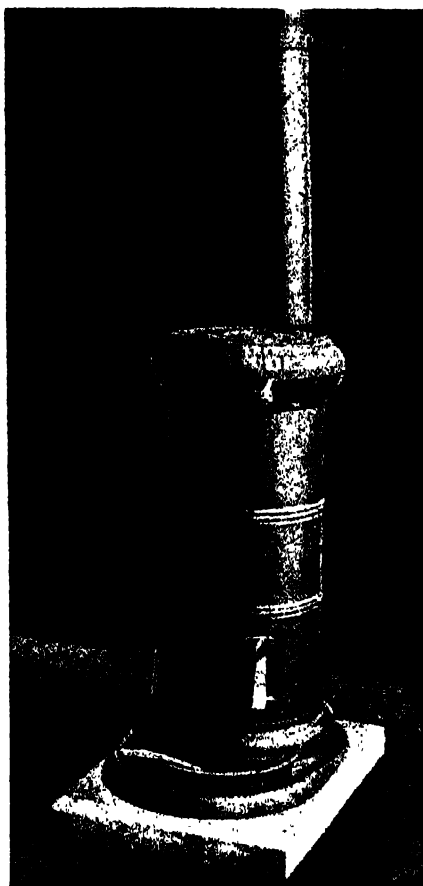
STORING: Of Vegetables, Fruits, etc.

Beetroot, carrot and turnip should be lifted in autumn when growth is complete and stored at the foot of a wall or fence. A covering of earth, sand or old ashes will provide protection from frost. Or they may be stored in boxes containing one of these materials and placed in a shed. Potatoes are lifted when the tops have died down, and after having been exposed to the air for two or three hours to dry the skins they are placed in boxes or tubs or in heaps in a frost-proof shed. Care should be taken to store only sound tubers, and it is wise to scatter a little lime on them.

Parasip, salsify and scorzonera are dug as required. To enable the roots to be lifted in severe weather the soil should be covered with bracken or straw to prevent its being frozen. Onions when fully ripened should be tied in bunches, as in Fig. 4, or made up into "ropes" in an airy shed or even on a sunny wall. Savoy and other cabbages, kale and Brussels sprouts are very hardy, but broccoli, when fully developed, should be lifted and hung, heads down, in a shed.

Roots and Bulbs. Flower roots of a tuberous nature which cannot be left in the open ground during winter should be lifted as soon as the first frost has touched their foliage. Their stems should be cut down. After they have been in a cool place under cover for excess sap to drain away, they should be stored in boxes of sand, as in Fig. 7, in the shelter of a frost-proof shed. Bulbs such as daffodils and tulips should be left in the soil until their foliage has become yellow, drying them slowly in a shaded, airy place, and storing in boxes away from frost: the foliage must be thoroughly ripened before storing.

Gladioli corms and others should be lifted before winter sets in, tied in bunches, and suspended in a cool place until their foliage has withered, when they may be stored in boxes of sand. Geraniums and other bedding plants must be taken indoors in autumn, potting them up after trimming. A simple and common method of dealing with geraniums in the winter months is illustrated in Fig. 5.



Stove. Fig. 1. Slow combustion coke-burning stove, with piping passed through roof.
Courtesy of Smith & Wellstood, Ltd.

Apples and Pears. Apples and pears should be graded according to size and quality, storing them, if possible, in a rack of trays, as shown in the diagram. Where the quantity is small, separate fruits may be suspended to beams or rafters in a cool and airy place, as in Fig. 2. Grapes will keep in bottles of water containing a few pieces of charcoal, the bottles being fixed at a slight angle in a dark and cool place. Nuts must be gathered when fully ripe and should be stored in boxes of sand which are set in a cool, dry place. Apples keep best if wrapped in special oiled papers sold by horticultural dealers for the purpose.

Storage cupboards constructed as explained below are probably the best solution of the problem, since the fruit is stored on single shelves and can easily be examined, any which show signs of deterioration being removed for immediate use.

Ordinary packing cases or Tate's sugar boxes may, for the sake of cheapness, be used, but it is better to make the boxes a certain standard size, so that all shelves are interchangeable. Ordinary cheap white-wood may be used 4 ft. by 2 ft. 6 in. by 2 ft. 6 in. The boxes themselves are made from 1 in. by 8 in. tongued and grooved

wood and the sides may be joined together by a simple dovetail. At suitable distances inside each box, six $\frac{1}{2}$ in. grooves are cut, into which $1\frac{1}{2}$ in. strips of wood are screwed. The inch which projects into the box forms convenient runners along which the trays slide.

Stork's Bill. See Heron's Bill.

STOUT. A dark brown malt liquor, stimulating and nourishing, stout is a superior kind of porter. It is brewed in much the same manner as ale with roasted malt to give it colour. Oatmeal stout is also made.

Stout is a drink which blends very well with cheese or a cheese savoury. It is also good with oysters. On account of its somewhat heavy qualities some people prefer it mixed with bitter beer, half and half. It should be served in a pewter or silver tankard.

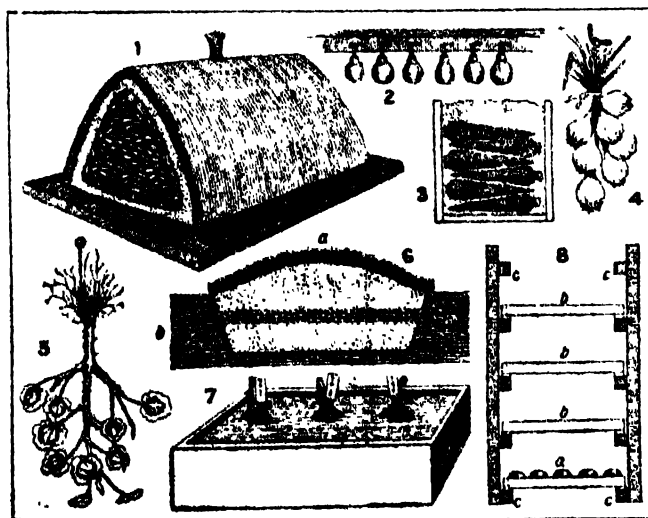
From a medical standpoint really good pure stout, like other good beers, is certainly the most nourishing of all alcoholic drinks, but still it contains only a very small quantity of nutritious material. With some people flatulent indigestion is a very common result of drinking it, and when nursing mothers take it their babies may have their digestions upset. See Beer; Diet.

STOVE: For Solid Fuel. A stove differs from a fire because the fuel and heat are enclosed in an iron or some other kind of casing.

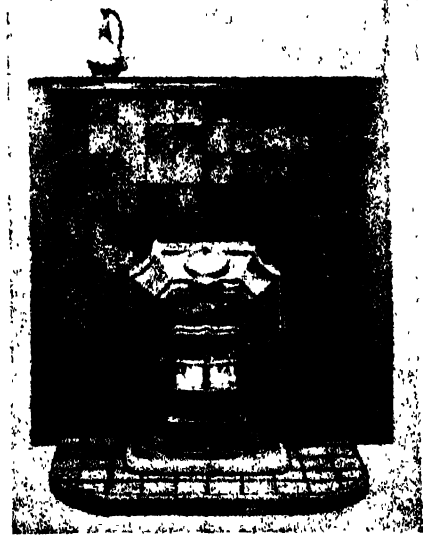
The principle on which many stoves work is that known as slow combustion. There is an enclosed furnace in which the rate of fuel consumption can be controlled by regulating the quantity of air supplied to the fire.

A stove of useful and simple type is shown in Fig. 1. It consists of a cylindrical iron casing lined with fireclay, and the fire is laid on the solid clay bottom at the base, there being no fire bars. Though sometimes a little troublesome to light, stoves of this type are efficient and economical in use. The kindling wood and other lighting material should be dry, and the stove should not be filled until the fire has taken hold. Coke or anthracite is suitable fuel. Stoves of this kind are commonly fixed in school rooms, halls, or workshops. It is best to keep the stove pipe inside the building, if a brick flue is not available, as condensation sometimes causes trouble when the pipe is taken through the wall and carried up outside.

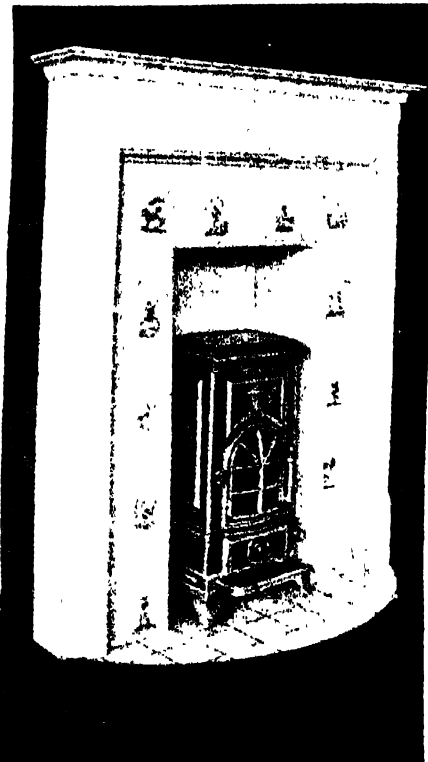
Of the many patterns of coal stove, the varieties that burn anthracite or similar fuel have many advantages, and are readily fitted to a fireplace in place of an existing grate.



Storing crops and plants. 1. Potato clamp. 2. Suspended pears. 3. Parsnips or carrots in box of sand. 4. Suspended onions. 5. Geranium in winter. 6. Winter garden in sand; a, turves, grass apparatus; b, soil. 7. Storing cabinet. 8. Apple or pear rack in section: a, fruit; b, tray; c, tray supports.



Stove. Fig. 2. Stove fitted to an existing fireplace. It burns anthracite or coke, and is fitted with automatic ventilating check valve and gas tube.
Courtesy of Smith & Wellstood, Ltd.



Stove Fig. 3. Slow combustion stove which fits into a fireplace recess. It has an ashpan regulator, and a slide damper in the flue at the back

Courtesy of Smith & Wellstood Ltd

To take full advantage of this class of stove it should be kept burning continuously during the cold weather, so that the room is always at a comfortable and equable temperature. Figs. 2 and 3 show representative patterns.

Fuel Consumption. The fuel consumption of a stove suitable for use in a room 20 ft. by 12 ft. would be approximately 1 cwt. anthracite per week (continuous burning). This is based on the maintenance of an average indoor temperature of 62° to 64° F., with a minimum outdoor temperature of 32° F. Coke can be used, the kind known as washed nuts No. 2 being suitable. Owing, however, to its tendency to choke and hang up in the stove, and its greater ash deposit, coke is not so good for continuous service as anthracite.

Stove Brush. For cleaning the fireplace in the home a strongly made brush is required, with stout grip-handle screwed on to the back, and there is a varied selection of oval and oblong shapes. The chief consideration should be a well-filled bristle surface with the knots securely drawn into the stock with wire.

The hair is trimmed level, which with a curved stock means longer knots at the ends than in the middle; some have distinct wings or tufts at the ends to facilitate getting into corners, and negotiating uneven surfaces. Very stiff bristle is not necessary, but a brush of pure bristle, or a good mixture of hair length, will outlast several inferior articles. See Anthracite Stove; Boiler; Burner; Cooker; Fireplace; Oil; Range.

STOVE HOUSE. A stove house or hot-house is a glazed structure in which a high temperature can be maintained, thus permitting the forcing of fruits and the cultivation of plants native to tropical climates. Such structures require skilled attention and maintenance, and are only suitable for market growers, specialists in exotic plants and ferns, and amateur gardeners of ample means. For the average gardener a cold or warm greenhouse will be found more economical, and, within limits, will be of greater all-round

utility. The construction of a stove house for amateur purposes can follow very largely on the lines described for greenhouse and conservatory building. Usually the temperature is kept at 60° to 65° at night. Consequently the arrangements for heating the stove house must be fully adequate to the demands made on the system.

The section of a simple stove house is shown in Fig. 1, partly cut away to reveal details of construction. The lower part of the walls is built in 9 in. brickwork with ventilating or air bricks at intervals. There are skylights or openings in the roof, and by control of the inlet and outlet the desired temperature and ventilation are maintained. The air bricks can have shutters to close them, and these are controlled by a long handle or rod, the end reaching to the front of the tiers of hot water pipes.

The pipes will have to be of adequate capacity to maintain the heat, and may be in one continuous system, or in two or more distinct sets, each controlled by separate valves. The average size of these cast-iron pipes is about 4 in. diameter. The heating surface of such a pipe can be reckoned roughly as 1 sq. ft. per foot of length.

Heating Capacity. Thus, if a stove house were to be, say, 18 ft. wide and 50 ft. long, with 6 pipes a side, there would be roughly 1,314 sq. ft. of pipe area if the pipes were set on the three sides of the house, leaving one end free for the door and entrance. The boiler would therefore need a heating capacity equal to about 1,300 ft. run of pipe 4 in. diameter, and would probably measure about 5 ft. long, 2 ft. wide, and 3 ft. high. These sizes are approximate and vary with the make and type of boiler.

The side staging can be made of wood or preferably of stone or slate, which may be set into brickwork as shown in section in Fig. 2. The stages or tables can be covered with a layer of coarse sand or other material to a depth of 2 or 3 in. whereon to stand the pots. The purpose is to absorb moisture and give it out again for the proper development of the plants. See Conservatory; Greenhouse; Orchard.

STRAIN.

Muscular strain is particularly common in people who go in

for games and exercises without the necessary preliminary training, as may be noted at the beginning of the cricket, football, and other sports seasons. In most cases of severe strain some of the muscular fibres are torn, and unless proper care be taken the muscle may remain weakened for a long time. Rest is the cure, while cold, heat, or other anodyne applications will be useful at first. Slings, bandages and strapping help to secure absolute rest.

Heart strain is a popular name for dilatation of the heart, usually caused by excessive muscular exertion. It may come on suddenly from a single great effort, as in lifting a heavy weight, or the heart may dilate more gradually in consequence of repeated efforts beyond the person's strength. Cycling up hills is a common cause, being especially injurious to growing boys and girls. Week-enders who lead a sedentary life from Monday to Friday, and then start on a long walking tour, hill-climbing, rowing, etc., are frequent sufferers from heart strain.

When this occurs the patient may feel considerable pain in the region of the heart, he suffers from palpitation, may faint from slight causes, and is liable to sleeplessness. For sudden or acute heart strain absolute rest is necessary. In more severe cases, rest in bed with mustard plasters to the feet and legs, and ice over the heart, will usually give relief. A very important factor in predisposing the heart to strain is some temporary weakness due to recent influenza or some other infection. A day's rest in bed is the best means of allowing an overworked heart to recuperate. People who have difficulty in getting through the week should therefore make a habit of taking such a rest periodically, and this applies not only to those with damaged hearts but to the aged. See Exercise; Heart; Sprain.

STRAINER. The shape of a strainer for culinary purposes may be round or conical.

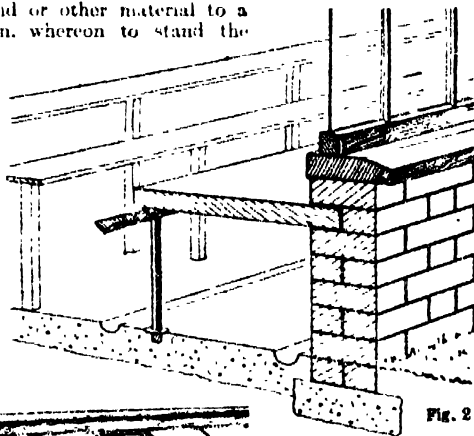


Fig. 2

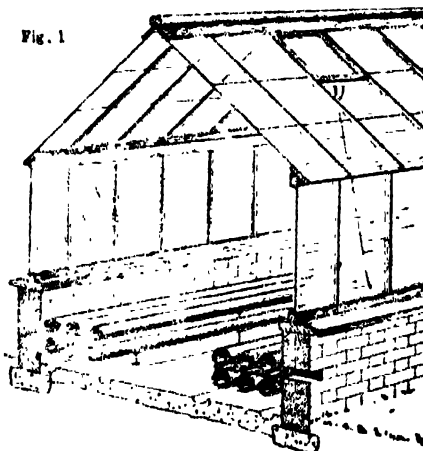


Fig. 1

Stove House Fig. 1. Sectional view of a simple type of forcing house, showing heating pipes. Fig. 2. Method of setting stone side table into brickwork

which the liquor falls. In larger round strainers two short handles, one on either side, replace the one in the smaller.

An excellent strainer may be devised by using a piece of muslin. The material should be held or fastened over a bowl and the liquor poured through it. Hair or wire sieves and colanders may be used as strainers. A very small strainer shaped like a tiny bowl and perforated or fitted with fine silvered woven wire is often used to retain the leaves when pouring out tea. Some lemon squeezers are fitted with strainers which keep back the pips and portions of pulp, leaving the juice clear.

Gravy strainers are convenient for small quantities of soup, for finishing sauces or for coating purposes, and also for pouring sauce or custard round a dish. For this purpose the conical form of strainer should be used. When larger quantities of stock have to be dealt with a sieve is inverted on a bowl on which it will rest firmly and the stock is poured through

quickly. A hair sieve should be used for the more delicate varieties of stock, but a wire sieve is suitable for any ordinary kind. For straining completed soups, if only a small quantity has been made, a conical strainer is best, but larger quantities must be strained through a sieve into a bowl and then re-heated.

To strain sauces, use a hair sieve and pass through as much of the solid matter as will be absorbed by the liquid. No acid sauce should be passed through a sieve fitted with brass wire.

There are many liquid or semi-liquid cookery ingredients which require straining. Milk is better strained before being used and sometimes it is necessary to strain it after it is boiled. Eggs when beaten should be strained to remove the thread. This hard piece will be quite apparent in a pudding or custard if not strained out. Strain the eggs when sufficiently mixed but before they are entirely beaten, and continue the whipping after straining. When using yeast and after the liquid has been added to it, let it be strained, using a fine conical strainer. *See Fish Kettle; Jelly Bag; Labour Saving; Soup; Stock; Vegetables.*

STRAINING POST. A particular type of post is adapted to take the strain of fencing material. In a wire fence, for example, the wire must be at a good tension, and this is ensured by specially braced posts being placed at intervals in the fence so that the slack of the wire may be drawn up tightly. *See Fence; Post.*

STRAMONIUM. The dried ripe seeds and the dried leaves of the thorn apple furnish the preparations of stramonium, which has an action closely resembling that of belladonna. Stramonium is chiefly used to relax the spasm of the bronchial tubes occurring in asthma.

For this purpose the drug may be given internally in the form of the tincture, or cigarettes made of the leaves may be smoked, or the fumes of a burning powder containing the dried leaves mixed with powdered nitre, etc., may be inhaled. Tincture of stramonium is given in doses of 5 to 15 minims. Stramonium sometimes has a slight effect on the heart, rendering its beating less regular and even producing palpitation. *See Asthma.*

STRAP. Odd straps may be bought from leather stores, and it is worth while buying a good one, for cheap leather wears rapidly and sometimes stretches. When it becomes necessary to make new holes in a strap, use a sharp skewer, holding the leather over it and pressing the point through. This is more satisfactory than cutting the strap with a penknife.

When straps have been laid aside for some time, and are to be used again, make certain that the buckle is firm. If the leather has become hard, soak it in hot soapy water for a few hours, and then hang it up in an airy place to dry. Finish by rubbing it vigorously with a soft rag dipped in linseed oil. *See Harness; Leather.*

STRAPPING. A few strips of adhesive plaster may be applied to an injured or diseased part for the purpose of giving support and securing rest. In some cases ordinary adhesive plaster suffices, in others something stronger will be required and calico plasters are employed. *See Adhesive Plaster.*

STRAPWORK. This is the name of an ornament used on furniture and metalwork. It is formed by narrow strips of wood or metal, as the case may be, crossed to form a lace-like pattern. *See Guilloche; Jacobean Style Tudor Style.*

STRATHSPEY: The Dance. This Scottish dance is a type of reel, the difference lying more in the time than in the actual steps



Strainer. White enamelled strainer suitable for use with vegetables.

In common with the reels the Strathspey tunes are divided into two parts of 4 bars each, but Strathspey music is played more slowly, the steps being energetically rendered and with jerky effect, in contrast to the more

gliding movements of the true reel. The jerkiness is due to the fact that the notes of most Strathspey tunes are alternately a dotted quaver and semiquaver, the bar frequently terminating in a crochet. In the modern Scottish reel part of the dance is often in Strathspey time.

Typical steps include the setting step, in which the right foot is placed behind the left; the dancer sinks and hops on it and then the same movement is repeated with the left foot behind the right. Another step is known as cross passes. The dancer springs to one side with the right foot, immediately passing the left across it, hopping and crossing again, which finishes one step. It is repeated, beginning the spring with the left foot.

A constantly recurring step is the open step, beginning with the left in the second position and then with straight knees the dancer makes a smart spring upon the toes to the fifth position and does a like spring being careful to let the foot which was before in the first spring be behind in the second. *See Reel.*

STRAW. Consisting of the dried stalks of wheat and other grain, the uses to which straw is put are manifold. In building it is employed for thatching roofs; in the home it is seen in the form of baskets, bags and matting; and it is made into hats of all colours and shapes, as it dyes and bleaches well in both fine and coarse varieties.

STRAWBERRIES AND THEIR CULTURE

And Various Ways to Cook and Serve Them

The directions given here on growing this fruit are followed by information about serving it, after which come recipes for various strawberry dishes. *See Larding; Netting.*

This fruit is grown most successfully on well-tilled land which does not dry out in summer: it is not satisfactory on very light sandy soil unless old turf and manure are dug in freely. The best time to plant is in August or early September, using small plants which were layered in pots of soil in June and July. If this practice is followed there will be a fair crop of first-rate fruits the following summer, an abundant crop of good fruits the second year, and a heavy crop of smaller fruits the third year. It is the usual practice to destroy the strawberry bed after it has borne three crops and plant a fresh one, but the old plants may be left for another year or two if desired, though they will produce only small fruits. Strawberry plants should be set from 18 to 24 in. apart according to the vigour of the variety.

In late summer dead and diseased leaves should be removed together with all weeds, and a dressing of manure put on the soil. Before the blossoms open in spring, straw should be spread among the plants; it will keep the fruits clean and free from soil splashed up during rain. The mats specially sold for this purpose are now used in many gardens instead of straw. The plants must be covered with fish netting to prevent the fruits being damaged by birds.

The best flavoured strawberries are Dr. Hogg, Countess, British Queen, and The President. British Queen needs to be layered every year, the bed being replanted each autumn. These varieties are rarely

grown nowadays; they have been superseded by others of less delicious flavour but better constitution. Royal Sovereign, Tardive de Leopold, Fillbasket, Sir Joseph Paxton, The Duke, Guyon's Late Prolific and King George are favourite sorts. Viscountess de Thury, which bears heavy crops of rather small fruits, is an excellent strawberry for jam-making. The perpetual-fruited strawberries St. Eacre and St. Antoine de Padoue bear fruits both in summer and autumn.

To obtain an early crop of strawberries under glass in May, runners layered in small pots of soil in June should be potted in 6-in. pots in August, in a compost of loam with which a little decayed manure and sand have been mixed. If placed in a slightly heated glasshouse in December and January, they will yield a succession of fruits in late April and May.

Strawberry Pests. The chief pest of the strawberry is mildew. This fungus attacks



Strawberry. Fine fruit of the variety known as Bedford Champion.

both old and young fruit, covering it with a white mildew, and causing the older fruit to decay. Though often observed only on the fruit, it develops first on the under surface of the leaves, a point which should be noted as it is only in the early stages that remedial measures can be satisfactorily applied. The mildew usually appears in May.

As soon as it has been discovered the plants should be dusted with flowers of sulphur or black sulphur, and the treatment repeated if necessary. A small pair of bellows, called a sulphurator may be used for this purpose, but if one is not available the sulphur may be shaken out of a loosely woven bag attached to a stick.

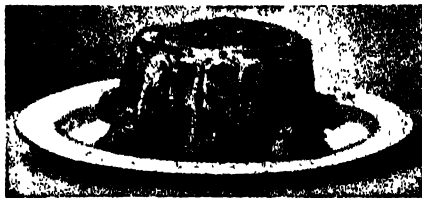
Leaf blight, in the form of red spots which run and spread on the leaves, also occurs, usually after the fruiting period is over, but with a weakening effect upon the subsequent health of the plant. Another pest, which can be dealt with in the orthodox way, is green fly. The fruit may also be attacked by slugs, which are best combated with soot or lime or with traps of brewers' grains. Red spiders may attack plants grown under glass if the air is allowed to get dry, but proper syringing will keep this under.

An insect known as the strawberry tortrix moth is at times very destructive. The damage is done by the caterpillar, which eats the foliage in May and June. The only satisfactory treatment is to pick over the plantation by hand on the first appearance of the pest. To keep the plant clear of another destructive insect, the strawberry blossom weevil, all dead leaves, waste straw, and the like, should be removed from the vicinity of the beds, as the adult weevils dwell therein in the winter, whence they issue forth when the strawberry blossoms are beginning to open.

How to Cook. Freshly picked strawberries may be served with cream or included in fruit salads, compotes, trifles, and other sweet dishes. They are also made into jam, wine, ices, flans, and pies. If fresh berries are not obtainable the bottled or tinned kinds may be used instead. Those preserved in tins are sometimes lacking in flavour and almost always lose their bright, attractive colour. For the latter reason they are unsuited for garnishing, but for other purposes the colour may usually be restored with a little cochineal. Strawberries combine well with raspberries and several other kinds of soft fruit, and make an excellent filling for fruit shortcakes.

Strawberry Charlotte. Either fresh or tinned fruit can be successfully used to make this sweet. Prepare it by dissolving a pint packet

of lemon jelly in $\frac{1}{2}$ pint hot water, then pour a little of it into the bottom of a mould and leave it to set. Stalk and wipe a few small strawberries, dip them in jelly, arrange them in a ring in the mould, and in the centre put a



Strawberry Charlotte, made with fresh or tinned fruit, lemon jelly and sponge fingers

few diamond-shaped pieces of angelica, also previously dipped in melted jelly. Leave these to set, then cover them with a little more jelly.

While this layer is setting, cut the ends from a few sponge fingers so that they will stand upright, then place them round the sides of the mould, standing them on the jelly. They should reach just to the top of the mould, and if they are too long they should be cut. Mix a few biscuit crumbs with 2 table-spoonfuls of melted jelly, and if there are any cracks between the sponge fingers, fill them up with this paste. Set the whole aside in a cool place.

Make $\frac{1}{2}$ pint of strawberry purée by rubbing some fruit through a hair sieve. Add 3 oz. castor sugar and 1 teaspoonful lemon juice to the purée and mix them well. Whisk 1 gill cream until it thickens, then add the fruit purée to it gradually, and lastly strain in $\frac{1}{2}$ oz. French leaf gelatine dissolved in $\frac{1}{2}$ gill hot water or strawberry syrup. Stir the mixture over ice until it begins to thicken, then turn it into the mould and leave it to set.

When ready, turn it out on to a dish and garnish it with a few strawberries. If tinned fruit is used, the garnish should consist of strips of angelica, and glacé cherries.

Strawberry Fool. Wipe and stalk 1 lb. strawberries and then rub them through a hair sieve, adding to the purée 3 oz. castor sugar and 2 teaspoonfuls lemon juice. Mix with a pint of rich custard and whisk well.

Strawberry Fritter. Only the large, firm strawberries are suitable for fritter making. Dredge them well with sugar, sprinkle them with kirsch and leave them in a cool place for about $\frac{1}{2}$ hour. Then dip them in batter and fry them for a few minutes in a deep pan of smoking hot fat. Drain them thoroughly, dish them on lace-paper and serve them sprinkled with more castor sugar.

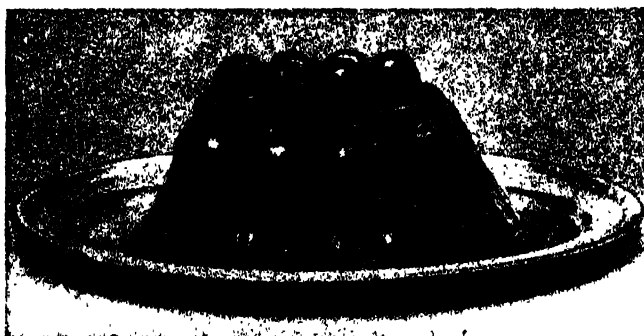
Strawberry Jam. In making strawberry jam, $\frac{1}{2}$ lb. to 1 lb. sugar should be allowed to every lb. of fruit. Stalk and wipe the

strawberries, put them into a preserving pan and cook them slowly until some of the juice has been extracted. Then add the sugar and continue cooking slowly until it has dissolved. The jam should then be boiled steadily for an hour, when it may be put into pots and tied down.

Strawberries and gooseberries together make an excellent jam. To prepare it, top and tail 6 lb. gooseberries and pick over an equal quantity of strawberries. Put them into a preserving pan with $1\frac{1}{2}$ pints water, add 10 lb. sugar and cook the jam slowly until the sugar has dissolved. Then bring it to the boil, boil it for about 1 hour, and turn it into pots.

Strawberry Jelly. A tin of strawberries in syrup, $\frac{1}{2}$ pint hot water, a pint packet of strawberry jelly, and a few pieces of angelica are needed to make this sweet. Dissolve the jelly in the hot water and add to it a gill of strained syrup from the tin of strawberries. Rinse out a mould with cold water, set a little of the jelly in it, and then decorate it with the angelica dipped in jelly.

When these are set, pour over a little more jelly, let it set and then add a layer of strawberries. Continue with these strawberry layers



Strawberry Jelly, made with tinned strawberries, and decorated with small pieces of angelica. Whipped cream can also be added

until all the fruit and jelly are used; then leave the whole to set. Whipped cream may be served with it.

Strawberry Pie. To make this, line a greased pie-dish with some short-crust pastry, then fill it with strawberries, strewing these thickly with castor sugar. Put on a top crust, make two or three slits in it with a knife, so that the steam may escape, and bake it in a hot oven till it is lightly browned. When it is done, dredge the top of the pie with some more castor sugar. It should be served quite cold, accompanied by whipped cream.

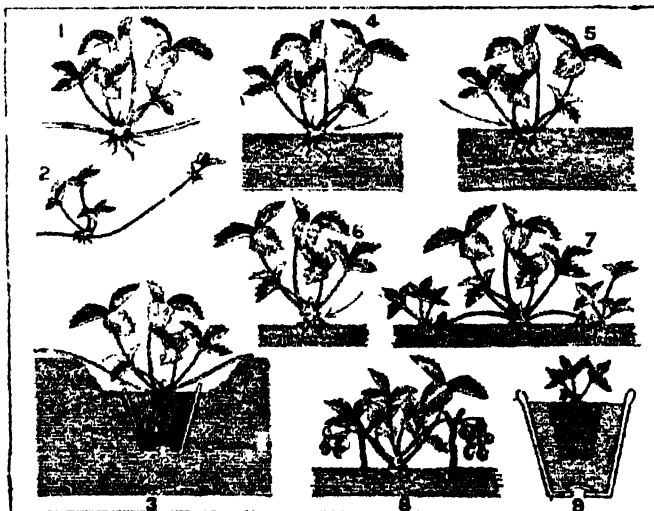
Strawberry Pudding. A cold strawberry pudding can be made by lining a pudding-basin with sponge cakes, filling up the centre with strawberries, gently heated in syrup, and then covering them with more sponge cakes. Cover the pudding with a weighted dish, and leave it to get cold before turning it out and serving with cream.

STRAWBERRY-RASPBERRY. This plant is often wrongly described as a hybrid between the two fruits, but it is a bramble or rubus. The plant is very attractive with its bright green leaves, white blossoms, and red fruits, but the latter are most palatable in a cooked state. See Raspberry.

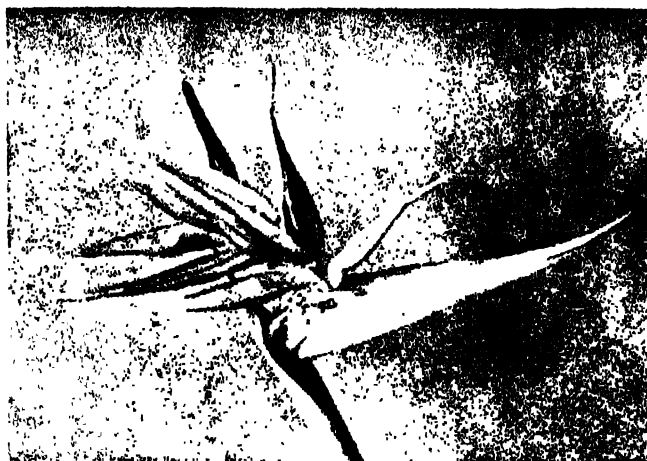
STRAWBERRY TREE. The hardy evergreen strawberry tree produces white or bluish-coloured flowers in spring and summer, followed by globular reddish fruits somewhat resembling strawberries. See Arbutus.

STRAWBOARD. Strawboard is a form of cardboard commonly brown in colour which is chiefly used in the home for packing purposes, as, for instance, in sending pictures or other articles through the post.

STRELITZIA. This striking plant is suitable only for a large heated greenhouse. It has broad leaves and the blue and yellow flowers are on stems 5 ft. or more high. Owing



Strawberry Cultivation. 1. Good runner plantlet. 2. Poor sample. 3. Runner rooting in snail pot. 4. Correct planting. 5. Planted too deep. 6. Planted too high. 7. Potting down plantlets. 8. How to support the fruit. 9. Pot-planted plant transferred to fruiting pot



Strelitzia. Curiously shaped blossom of the greenhouse perennial plant that is sometimes given the name of Bird of Paradise flower.

to their brilliant colouring the strelitzia is commonly known as the Bird of Paradise flower. It may be grown in large pots or in a bed of soil; a suitable compost consists of loam with sand and decayed manure or leaf-mould. Propagation is by division.

STREPTOCARPUS. This is the name of a family of dwarf, greenhouse perennial plants that bear comparatively large flowers of many colours—blush, crimson, purple, rose and so on. They are raised from seed sown in early spring in pots or boxes of loam, leaf-mould and sand, and kept in an average temperature of 50° with plenty of moisture during the months of summer and autumn. Young plants may be placed in a cold frame during the summer. As soon as the seedlings are large enough they should be shifted into 3 in. pots, and a further shift may be made later on, if the young plants thrive and are sturdy. Flowers are produced, as a rule, about 6 months after sowing. See Greenhouse, also illus. below.

STRETCHER: How to Make. A stretcher may be improvised by taking two poles, broom-handles, or something of the sort, and rolling each up in a side of a blanket till they are about 2 ft. apart. The blanket is fixed in this position, and two pieces of wood are tied across the poles, one at the head and the other at the feet, to prevent the poles coming together. Instead of a blanket two sacks will serve if the poles are pushed through

stairs. If, however, a leg is broken it should always be carried level with or higher than the trunk. A stretcher must never be carried on the shoulders or over a high wall, as one of the bearers may stumble and the injured person thrown off. See Bandage; First Aid.

STRETCHER:

In Woodwork. In woodwork a stretcher is a piece of wood joining two rails, which is used for strengthening the framework of cabinets, tables, chairs, and other forms of construction. See Cabinet Making; Chair Sideboard.

STRING. There are so many uses for string in every household that it is generally a good plan to keep a ball of medium thick twine in a box, or in a canister with a hole in the lid. Many housewives keep a string bag,

often hanging it on the back of a hall or kitchen cupboard door, in which they place lengths of string removed from parcels.

If parcels of some weight have to be carried any distance it is a convenience when tying them up to make a handle. The string is passed twice round the longest side and several inches apart, and around these two a length of string is passed across and across three or four times. The loose end of the string is then twisted round the strands, and between them and itself to form a handle, closely covered with buttonhole stitch.

With a heavy parcel it is best to start as above, but to twist the string round a number of times. A piece of stout, pliable cardboard as wide as the handle should be wound over the strands and made fast with gum.

Kitchen Uses. In the kitchen fine string is most needed for tying down jam jars, trussing fowls and preparing joints for the oven. For tying down the cloth over a pudding basin a stouter string will be required, also for tying together the feet of a turkey, goose, etc., that it may hang in the larder. Small ends of string can be utilized to make loops with which to hang up kitchen utensils to hooks, etc. A piece of fine string will cut a bar of soap.

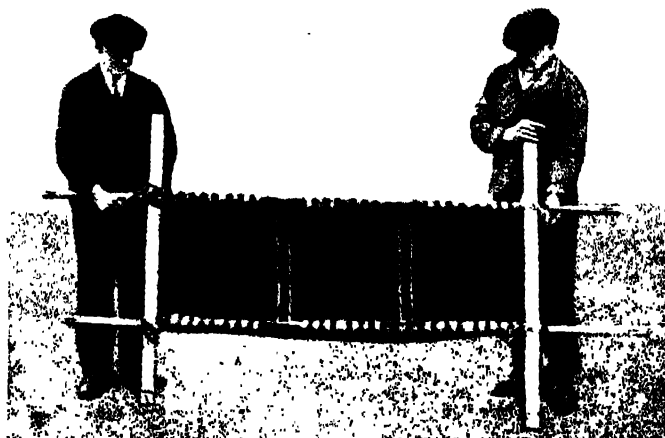
The use of string in mending is usually merely temporary. In mending a broken

cup, for example, string or tape is frequently tied around it to keep the pieces together until the cement sets. The same use is made of string in glueing together a box, the leg of a table, etc. For mending or for making sacks, string threaded through the eye of a specially large needle is used. See Macramé; Netting; Parcel.

STRING BAG: How to Make. A string bag is fairly easy to make. To make one that will hold six tennis balls, the requisites are a ball of string (white string, strong but not too thick, being the most suitable), a netting needle (see page 836), and a piece of wood, resembling an ordinary ruler, about 12 in. long and 1 in. wide.

The netting needle should be of wood or bone. The needle or mesh, as it is called, should be 5 or 6 in. long and about $\frac{1}{2}$ or $\frac{3}{4}$ in. wide. It is forked at both ends so that the string can be wound upon it. This should be tied very tightly and only a little at a time so that the needle will slip easily through the loops.

The work consists of netting, which is a series of loops knotted evenly. To begin with, the worker should make a foundation loop with a separate piece of string. This should be about 10 in. long, and its ends knotted together. It should then be slipped



stretcher, how it may be improvised. Two poles about 8 ft. long are rolled into the sides of a rug or blanket till they are about 2 ft. apart. The corners of the rug are then tied to the poles and cross-pieces of wood are fixed on to prevent the poles being drawn together by the patient's weight.

over the knob of the chair, or on a nail, or anything else that will allow it to be pulled at a height convenient to the worker. Having arranged the foundation loop with an ordinary knot, the worker should fasten it to the end of the string that has been wound on to the needle.

Then, taking hold of the mesh with the left hand, he should wind the string, marked A in the diagram, from the needle once round the mesh and pass it through the foundation loop. He next draws the mesh up to the foundation loop, and places the first finger of the left hand upon the string B, at the point C. He next casts a loop of the working thread and passes the needle to the right of the foundation loop, between it and the mesh and through the loop which has just been cast. This enables the worker to form a knot which he can then draw tight against the first finger, which should be kept on the string B until this is done. It is important to bear in mind that the string is drawn towards the worker, not upward.

Fifteen stitches or loops should be cast in this way on to the foundation loop. The mesh may then be slipped out and removed, while a complete turn is given to the foundation loop on the nail. The work is turned over so that this work is begun on the left-hand side



Streptocarpus. Greenhouse plant with pansy-like flowers in pink, white or blue. See article above.

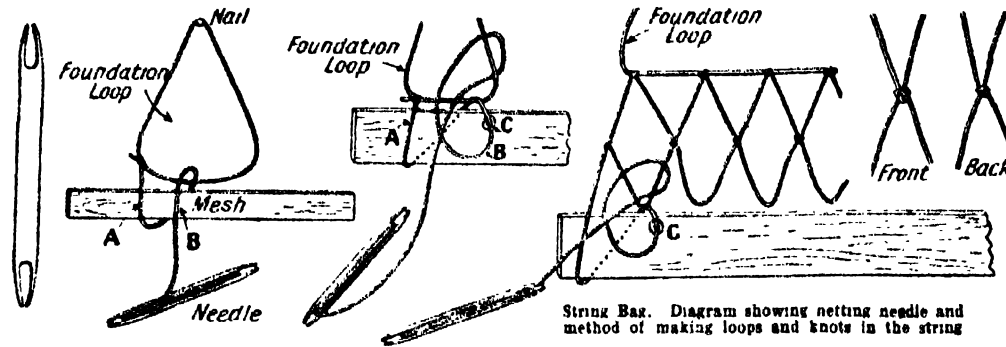
again, but at the same point at which it was finished off on the right. This strip, ready turned for the first stitch on a new row, will be seen on the bottom of the diagram. The next row is continued in the same way, but a

gathering, thus giving a much neater effect. Before stroking can be done, the gathering thread must be drawn up fairly tight and wound round a pin inserted in the material at the left end of the gathering. The cotton

surface. At the present day it is mainly restricted to calcareous materials with a mixture of sand.

Stucco was once used extensively for internal decorative plastering, such as for forming cornices or mouldings, and decoration of ceilings. It was composed of pulverized marble and gypsum, mixed with fine sand and clean water, and it hardened gradually, thus giving opportunity to work it into the design, which the plasterer did with the aid of small steel tools.

This kind of stucco has been superseded in Great Britain by stick and rag work. Mouldings are cast into the shape required and kept rigid with the aid of canvas, after these are placed in position, the joints are made



separate loop instead of the foundation thread should be taken up.

The whole bag is made in this way, row after row of knotted loops being worked from left to right. The work must be turned on the nail after each row. After about 25 rows it will be found that the strip of netting, when it has been doubled in half and joined up at the sides, will be long enough to make the bag required. To finish it off slip the mesh out of the last row and neatly cut off the needle string. Then take out the foundation loop and join up the sides as though they were being sewn, using the fingers as the needle, poking the string through the loop, and joining with a knot top and bottom. The bag is then complete except for the draw string at the top. This should be threaded through the loops which form the mouth of the bag. It should be about 20 in. long and of stouter string than the bag itself. The ends should be knotted after it has been threaded through the loops at the neck of the bag. See Netting.

STRING BOX. For holding string, boxes are obtainable in wood and metal. The wooden box is turned from hardwood, generally provided with a cutter. Metal boxes are composed of two half-spheres hinged together, some are provided with a ring for hanging and others have a metal base to stand upon. Boxes in wood pulp and papier mâché are obtainable which can be decorated by stenciling or other forms of painting. See Italian Renaissance Work; Lacquer Work; Pattern Printing, etc.

STRINGING. Stringings mean very thin lines of inlaid wood put round panels and the edges of constructional parts of furniture. Satinwood stringing on mahogany is used to give a light line on dark wood, and ebony to give the opposite effect. Stringing was much used by Sheraton and other makers at the end of the 18th century. See Parquet, Sheraton.

STRIPPING KNIFE. The knife used for stripping off old wallpaper and paint consists of a broad blade with a straight handle, the blade being so tempered as to give slightly when pressure is brought to bear upon it. After first wetting the wallpaper the knife is inserted under it and the paper peeled off in strips. With old paint this knife can only be used on large areas when a good deal of ground can be covered in a short time. The paint is scraped off with the knife after it has been burnt with the blow lamp. The stripping knife must be used in the direction of the grain of the wood. See Painting; Paperhanging.

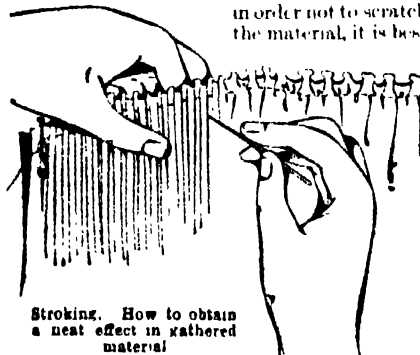
Stroke. See Apoplexy; Paralysis.

STROKING: In Needlework. This process consists in placing side by side, in even folds, the little flutes made in material by

must not be broken off, as the gathers are afterwards released to the size required.

Take the material in the left hand, with the right side of the fabric towards you, then take a needle in the right hand, with the point upward. Beginning at the left hand end of the work, raise each gather gently with the point of the needle, and stroke down into the little ruck which lies between, moving it gently to the left, so that it is placed under the thumb. Repeat this process until all the gathers are stroked under the thumb, then release the cotton at the left end, to make the gathering the desired size, and fasten off.

Care must be taken to stroke the portion of the material above the gathering thread, as well as below it, and in order not to scratch the material, it is best



to use a blunt-pointed tapestry embroidery needle for the stroking. See Gathering.

STRYCHNINE. The action and the medical value of nux vomica, the dried seed of an East Indian plant, depend almost entirely upon the strychnine which it contains.

Strychnine is one of the ingredients of Easton's syrup, and is valuable in many tonic digestive mixtures, acting as a stomachic and carminative. It is largely employed in the treatment of chronic heart disease and is an ingredient of expectorant mixtures in inflammation of the lungs or bronchial tubes. Strychnine should never be taken except under a doctor's immediate supervision.

STUARTIA. Growing up to 10 ft. in height, the beautiful shrub stuartia has nearly oval, toothed, pointed leaves and large white flowers in summer. It thrives out of doors, but should be planted in a sheltered sunny position. Ordinary soil can be made suitable by adding leaf-mould and peat. Propagation is most easily carried out by sowing seeds, but layering may be done in late summer. The best kind is *Stuartia pentagyna*, which bears large white flowers stained slightly with red.

STUCCO. This term has been applied in a general sense to the plastering of walls with any material designed to produce a finished

STUD: In Engineering. A stud or stud-bolt is a headless bolt with a screw thread formed at each end and an unscrewed portion between. It is screwed tightly into some fixed member, and the projecting end, in conjunction with a nut, serves to hold in position some other part, e.g. the detachable cylinder head in an internal combustion engine. See Bolt; Nut.

STUDY: Its Fittings. When it is possible a light, airy room on the quiet side of the house should be chosen for the study. There should be a good heating arrangement and convenient artificial lighting, as it is difficult to do the best mental work when handicapped by any degree of discomfort.

With regard to the treatment of decoration and furniture most people would wish to aim at harmonious repose for the former and comfortable efficiency for the latter. Some would feel keyed up to work in a bright but austere furnished study, while others would prefer the more conventional style illustrated in Fig. 1 (opposite page).

A restful room of this type could be treated with dove-grey walls and ivory woodwork and ceiling, a deeper grey carpet with purple border, and the windows curtained with purple velours and ivory net. Touches of dull pink and yellow could be introduced in the cretonne covers.

A brighter room might have walls of duck egg green and furnishing fabrics in autumn leaf tints. A cretonne in old English needlework design would then be a good choice for curtains and any loose covers.

Some people prefer the bureau type of writing desk because of its more charming appearance in a room, but the flat-topped desk is more comfortable to work at than a bureau.

In many cases the owner of a study requires more than one or two small shelves for the accommodation of his books, and a bookcase with glass doors, which keep out the dust, is added to the furniture.

Fig. 2 (p. 1210) shows the study used by Edgar Wallace, the famous "thriller" writer. Comfort and colour are supplied by the rich tones of carpet and rug, the floor cushion, and the velvet furnishing fabrics. The modern note is emphasized in the two chairs with



Study. Fig. 1. Spacious and well-lighted study with conveniently placed desk, roomy white-enameled bookshelves, and comfortable chairs and chesterfield for moments of relaxation. Distinctive features are the alcove accommodating the fireplace and mantelpiece, and the space for pictures above the shelves.

tubular steel frames, in the writing table and in the severely plain bookshelves.

There are well-designed tables and ornamental covers for typewriters to be had which will harmonize with most furnishing schemes. A filing cabinet is often required and a cupboard with shelves in which to stow away stationery. The desk chair is a matter of individual taste, but a comfortable armchair in which to sit while reading, a fur-sized, solidly made table, and a good reading lamp may be considered essential.

Over a desk or low bureau, placed to the right of a window, near a corner of the room, an angle arrangement composed of two shelves which allow the requisite depth between them for reference books makes a useful corner treatment and a pleasing one if an attractive piece of china is placed on the top shelf. A small cupboard let into the wall near the desk is convenient for the telephone. See Bookcase; Library; Writing Table.

STUFFING: In Cookery. Stuffing is a savoury compound which is combined with meat, game, or fish in order to impart a rich or special flavour. Stuffing may be used to fill hollows, it may be laid between two flat portions of food, or, on the other hand, it may be converted into a coating.

If meat is boned it is often stuffed, while if made into a galantine a certain quantity of stuffing is mixed with the other ingredients which help to form the fillbug. Stuffing also is added to meat and poultry served whole. Veal is accompanied by what is known as veal stuffing, or forcemeat, and pork by sage and onion stuffing; poultry and game may be stuffed with a large variety of forcemeats, flavoured and seasoned in a suitable manner, but always made very savoury.

In meat the stuffing is inserted by raising up the skin covering a hollow or convenient place for pressing in a sufficient quantity; the position varies according to the nature of the joint, but the stuffing must be so placed that there is a possibility of equal distribution when carving takes place. It must be entirely covered when in the joint and fastened in place securely, or it will escape in the dripping pan.

In poultry or game the stuffing is pressed under the breast from the neck end of the bird. Sometimes a portion of it is inserted through

the vent under the lower part of the breast. Hares and rabbits are stuffed when the internal organs have been removed, and the hole should then be sewn up.

The practice of cooking stuffing apart from the food it is intended to flavour cannot be recommended, as the meat is prevented from absorbing the savoury ingredients while it is cooking. Stuffing made up into balls is added to meat pies to enhance the flavour.

Most varieties of fish may be stuffed. If the fish is whole the stuffing is inserted where it has been gutted, the opening is sewn up, and usually the fish is trussed round or in the shape of an S. Sometimes the stuffing is used as a filling for fillets, and often two small fish may

be split open, boned, and one fillet placed on another with stuffing between. All stuffing for fish should be well seasoned and flavoured liberally with lemon.

Many vegetables are stuffed with highly seasoned forcemeats, to which may be added chopped or pounded meat and sausage meat. Vegetables usually are partially cooked before being stuffed. If stuffed savouries are required, a case of some description must be prepared beforehand in which to serve them. This may consist of tomatoes with the inside scooped out, the halves of hard-boiled eggs with the yolk removed, or some other cup-like device. Olives frequently are stored and stuffed, and served as a savoury or garnish.

Sage and Onion Stuffing. To make sage and onion stuffing, mix 1 oz. fine bread-crumbs with three small chopped onions, two tea-spoonfuls of chopped sage, and salt and pepper to taste. Bind these ingredients with 1 oz. maiterine and a beaten egg, and mix the whole thoroughly before inserting the stuffing.

Sage, apple, and onion stuffing, which can be used for ducks, geese, and pork, is made thus. Peel three large apples and the same number of onions, put them into a pan with six sage and three lemon thyme leaves, and cover them with water. Cook them slowly, until they are tender, then rub them through a sieve, and to the pulp thus formed add enough mashed potato to mix the whole to the desired consistency, and season it well. This should stuff one goose or two ducks.

Chestnut Stuffing. This stuffing is particularly used with turkey, but is sometimes liked for fowls. About 24 chestnuts are sufficient for the usual amount required. They should be boiled until tender and then skinned. The stuffing is better when employed for chicken if it is enriched and the livers of two fowls, parboiled, should be pounded with the chestnuts, and 1 oz. fat bacon, 1 oz. chopped parsley, a pinch of nutmeg, and a little salt and pepper added, and all well pounded together.

For turkeys a less rich forcemeat is required, and the liver and bacon are therefore omitted. The chestnuts are baked for about 20 min., skinned and then simmered until



Study. Fig. 2. This dignified study with its solid mahogany desk and modern furnishing, exemplified by the two chairs in chromium plated metal tubing, belonged to Edgar Wallace, the well-known writer Humphrey & Vera Joel.

they are soft, in enough water to cover them. They are then rubbed through a sieve and mixed with a lump of butter about the size of an egg, and a sprinkling of seasoning. See Foremeat; Goose; Turkey; Veal; etc.

STUPOR. In coma the patient cannot be roused by any means, but in stupor he may be roused by speaking loudly to him, or by some other form of stimulation.

A large number of causes may give rise to this condition, e.g. concussion of the brain, as a result of a blow or a fall; compression of the brain, by a fracture or a tumour; epilepsy, abscess of the brain, meningitis, asphyxia; poisoning by opium, chloral, alcohol, and other narcotic drugs.

One of the most difficult cases to diagnose is that in which a man is found in a state of stupor, and smells of alcohol. The tendency is to suppose that the man is very drunk, but he may have taken only a little alcohol, while his condition is due to some one of the causes enumerated above. Mistakes are sometimes made with serious consequences to the patient. When there is the least doubt, the person should always be assumed to be ill, and be treated accordingly. See Coma.

STURGEON: How to Cook. The flesh of the sturgeon is solid, white, and not unlike veal. When fresh, the veins and gristle have a blue appearance, and the grain of the flesh is even; if the veins are brown or dingy in colour the fish is not good. The roe is preserved, and in the form of caviare it is highly valued as *hors d'oeuvre*. The isinglass manufactured from the air bladder is superior to gelatine for the purpose of stiffening jellies.

After cleansing, the skin of the sturgeon should be loosened with a sharp knife, starting from the backbone and dealing first with one side and then with the other. The skin is then laid over the fish again and fastened with string or tape. It is better thus to loosen the skin before cooking the fish, as it is not good served with it, and loosening facilitates dishing.

To boil sturgeon, take half a small fish and put it into a fish kettle, just cover it with water, and the rim of half a lemon, 20 black peppercorns, a small stick of horse-radish, and 1 gill of vinegar to each quart of water. Cook from 1½ to 2 hours very gently, then drain the fish, remove the skin and serve with a good piquant sauce.

One method of cooking sturgeon is to roast it. Cleanse 3 lb. of fish and remove the skin, but do not replace it. Bust each side of the flesh with salt and pepper, and then lard it closely, or cover it with thin slices of fat bacon, which should be tied on. Grease a thick sheet of white kitchen paper, and lay over it 2 prepared and sliced onions and 2 carrots, also prepared and sliced, 1 dessert-spoonful sifted dried sweet herbs, and 1 tablespoonful chopped parsley.

Wrap the fish completely in the paper and secure it. If the paper is not very thick it would be best to use it double. Melt 3 oz. margarine or good beef dripping in a baking tin, lay the fish in the tin, and bake it from 1 to 1½ hours, basting frequently. It should cook rather slowly. To serve the fish, remove the fastenings and paper, and if it is not well coloured return it to the oven to brown, then brush over the top with glaze and serve it very hot. A well-flavoured brown sauce may be handed round.

Sturgeon can be roasted like veal, stuffed with a good veal forcemeat. Let it be well basted, and served with thick brown gravy. One way of dishing it is to pour over it, when ready for serving, a good brown sauce. Garnish with cut lemon, and little rolls of bacon.

Sturgeon is sometimes cut in small steaks, and these should be broiled. Prepare and

cut the steaks, which should be about 1½ in. thick. Cover each with egg and fine seasoned crumbs, wrap them in greased paper, and broil them. Serve them with anchovy sauce. A little chopped parsley can be added to the breadcrumb.

For fillets of sturgeon, prepare about 2 lb. of the fish, and cut it into fillets. Melt 2 oz. margarine in a sauté pan, put in the fillets, and cook them very slowly. When done on one side, turn them and cook the other side; they will take about 20 min., but much depends on how thick they are cut. When tender, take them up and serve hot with a good brown sauce or Genevoise sauce. See Caviare; Foremeat; Isinglass; Sauce; Veal.

STYE: In the Eye. Inflammation of a little gland at the root of an eyelash results in a hordeolum or sty. This is a painful swelling which soon suppurates, the matter, if it be left to itself, finding its way out, usually through the inner lining of the lid. It will shorten suffering, however, if the affected lash is pulled out and the little abscess opened as soon as matter has distinctly formed. Until then hot applications, for example boracic fomentations, should be made.

Not uncommonly one sty is followed by a succession of others. The eye should be washed regularly with boracic lotion for some time after a sty. A lotion or drops of sulphate of zinc is also sometimes required. The general health may be depressed and require tonic treatment, and constipation if present must be corrected, as it may be a contributory cause. See Conjunctivitis; Eye.

STYPTIC. A drug or other agent used to stop capillary bleeding by contracting the blood vessels and furthering clotting of the blood is called a styptic. Very hot water has the same effect. Amongst the drugs used in this way are perchloride of iron, tannic acid, the salts of copper and lead, calcium chloride, hazeline, and adrenalin. Colwells applied directly to a wound act as an effective styptic, but should never be used because of the danger of poisoning the wound. See Bleeding.

STYRAX. This hardy shrub thrives in well-drained loamy soil with which leaf-mould has been mixed, and in a sunny sheltered place. One of the best kinds is *styrax japonicum*, 15 ft. or more high, with white flowers in summer. *Styrax obassia*, a Japanese white flowered shrub, is also beautiful. The gum resin called storax is obtained from *styrax officinale*.

SUCKER. To the gardener a sucker is a shoot rising from the subterranean stem of a tree or bush. Such can be used for propagation purposes, as in the case of the raspberry. The suckers which develop on the stocks on which roses, fruit trees, and certain shrubs are grafted or budded ought to be pulled up and destroyed. See Apple Sucker; Plum; Propagation; Pruning; Raspberry.

SUCKING PIG. This is delicious when obtainable. The young pig should be thoroughly cleansed, particularly the nostrils and ears (the head being served at table). Cut off the feet at the first joint, loosening the skin and leaving enough to turn under. The pig should then be stuffed with sage and onion stuffing, as for roast pork. Sew the stuffing up inside the body of the pig, then roast it as for roast pork.

To cook this dish to perfection, the flesh should be basted first of all with brine, then pour the brine away, and baste thoroughly and frequently with fat. Serve with rich gravy well flavoured with lemon juice, and hand round apple sauce.

The sucking pig should not be more than 3 weeks old, and it will take about 2 hours to cook. It is served split in half. And the snout and jaw should be trimmed off, leaving only the cheek and ears and the outline of the

snout and jaw. Sucking pig is sometimes stuffed with the chestnut stuffing used for turkey. See Pork; Stuffing.

SUÈDE. Obtained from sheepskin dressed soft and finished on the flesh side with a very fine nap, suède can be sewn and worked for all purposes just as easily as velvet. Suède is utilised largely in the manufacture of gloves, shoes, handbags, belts, hats, and sports coats. Artificial flowers are made from it, and it is dyed to many different shades.

Care of Suède Shoes. Wet suède shoes should be placed on shoe trees, or stuffed tightly with paper, and left to dry. They should not be dried in front of the fire, as this causes the leather to split. If they are mud-stained, they should not be brushed until they are thoroughly dry. Like all other suède goods, they can be cleaned with petrol (see page 923), the latter being applied with an old toothbrush. The pile or nap can be restored with sandpaper, or with a small wire brush which is sold for the purpose.

The best means of cleaning coloured suèdes that have become soiled in wear is by the use of the many coloured dry cleaners marketed for the purpose. Grease and other stains are best removed by rubbing briskly with a piece of suède, or a piece of chamois leather, used dry without any lubricant at all. Glass paper is also useful for removing obstinate stains. The employment of petrol, benzene, and other spirits is not advised for red and other brightly coloured suèdes. They will remove the stain, but may also cause the dye to fade and so give the leather a patchy appearance. Suède so treated will need to be redyed in order to restore its original colour. See Cloth Ball; Glass Paper; Gloves; Leather.

SUET: In Cookery. The fat which lines the loins and kidneys of sheep and bullocks furnishes the suet which is indispensable in cookery for making puddings and for other purposes. The best is that which surrounds the kidneys (kidney suet).

When suet is received from the butcher it should be examined to see that it is free from taint, as the slightest defect of that kind will probably spoil a whole dish. To prepare it, the skin is first removed and the suet is sliced up into flakes. It has then to be chopped finely. The success of the cooking depends to a great extent on the skill and thoroughness with which the chopping is done. Suet graters can be bought and do the work more quickly than it can be done with a knife.

Suet should be firm enough to chop without the necessity of adding flour during the process, but if the weather is close and the fat seems unduly soft, flake it, then add the whole quantity of flour needed for the pudding and finish chopping. By adding small quantities of flour, as is often done when chopping suet, the fat is merely worked into a paste and cannot be successfully mixed. It should also be remembered that any extra flour added for chopping destroys the proper proportions and takes away from the quality of the dish.

To keep suet for a few days the best plan is to remove the skin, chop the suet, and put it into a dish, covering it with flour. The fat must be entirely covered, and an account must be kept of the amount of flour used. The practice of burying a lump of suet in the flour tub, unskinned, is not good. The skin quickly becomes tainted and it then contaminates the flour.

SUET CRUST. For making dumplings and roly-poly, and also for covering meat or fruit puddings, a suet crust is made as follows: Chop finely 10 oz. suet, and mix it lightly with 1 lb. household flour which has been sifted, with ½ teaspoonful of salt. Work these

ingredients into a fairly stiff paste, using about $\frac{1}{2}$ pint cold water. Some housewives add baking powder to suet crust (see Apple Pudding), others consider that any raising agent should be avoided in the making of this crust.

The pudding should be perfectly light if the suet is properly chopped, the dough skillfully handled and not made too moist. A pudding may either be cooked in a greased pudding basin, covered with a greased paper, or as in the case of a roly poly, tied up in a floured pudding cloth. The pudding is plunged into fast boiling water and kept boiling the whole time of cooking. When mixing, pour the water

into the center of the basin and work in the flour round the sides as quickly as possible till all is mixed, but take care that the whole is smooth and the ingredients properly incorporated. The paste should be firm and no moisture should appear when it is cut or rolled. If a richer crust is desired the quantity of suet may be slightly increased.

The time required to cook plain suet or roly poly puddings varies from $\frac{1}{2}$ to 2 hours, according to size. Fruit puddings take about the same time. See Apple Roly-Poly; Dumplings; Plum Duff, etc.

Suffocation. See Artificial Respiration; Asphyxia; Drowning.

SUGAR: ITS USES IN THE HOME

Consideration and Comparison of Kinds and Qualities.

This contribution is connected with a great number of other entries in this Encyclopedia, notably the cake, jam, and sweet making recipes in which sugar is used. See Chocolate; Diet; Food; Jam; Sweets; Toffee, etc.

For home consumption sugar generally consists of loaf or lump sugar, granulated, castor, icing, and the varied forms of yellow or brown sugars. The very first consideration when buying any of these should be to ensure quality; the purchase of an inferior article is no economy in housekeeping, as moist, sticky sugars, even if slightly cheaper in price, are heavier in proportion to the pure crystals, while their sweetening power is considerably lower. The white crystalline sugars are the purest, and usually are free from the impurities frequently found in loose or brown sugar. Loaf sugar is not often adulterated, and the quality is easy to detect from the appearance. It should be clean looking and sparkling.

One or two rules for distinguishing good sugar, whether cane or beet, from inferior may be useful. A good white sugar should look very dry and crystalline, also when rubbed between the finger and the thumb it should be free from any feeling of stickiness, and should never appear clammy. Good sugar should be easily soluble, and may be tested with water. If dissolved in half its weight of cold water, and found to be free from sediment of dirt or pieces of foreign matter, it is absolutely pure.

White Sugar. Lump sugar can with advantage be used not only for table use, but for all the most delicate kinds of cakes and sweets. For use in cookery it needs, unless it can be dissolved in liquid, to be pounded in a mortar and passed through a fine sieve, and the rougher portions which remain must be pounded again and sifted until the whole is a fine powder.

White sugar should always be used for making jams and marmalade; not only is a greater degree of sweetening principle obtained from it, but the jams will be clearer, set better, and have a brighter colour. In some country districts moist sugar is used for jam making, but the preserve then has a rough taste as well as looking cloudy. Of course, something depends on the quality of the sugar. Summer and invalid drinks, also home-made wines, should be sweetened with loaf sugar. The more delicate kinds of toffees should be made, and jellies sweetened, with this sugar.

Granulated sugar is a purer variety of white sugar than inferior castor sugar, but for some cookery purposes, also for table use, it is rather coarse, and not so easily or so completely soluble as loaf sugar. It can be used for sweetening fruit in pies, in puddings, and for large cakes. A large white crystal sugar is specially refined for use with coffee.

Castor sugar, which is a pounded form of lump or loaf sugar, should have a bright, dry appearance, and the tiny crystals should also be well defined and even, as in granulated sugar. It is most suitable for table use, and also for sweetening delicate cakes where a spongy consistency is needed. It is likewise

used in making meringues, custard and whipped cream mixtures, whips, some glazes, and is sprinkled over pastries for decorative purposes.

Another form of white refined sugar is icing sugar. This is white sugar, pulverized until it resembles a fine powder, and the greater the extent to which it is pulverized, and the finer the powder, the higher the quality of the icing sugar will be, and the better the use which can be made of it for cooking cakes and for decorative icing. However good the sugar, it must always be treated by further sifting before it is used for cake icing. A fine hair, tannum, or silk sieve should be used for the purpose.

Brown Sugars. Of all brown sugars Demerara ranks the highest. It should be a golden brown colour, and the crystals should be dry and separate. It makes a good porridge sugar, and is sometimes used for coffee. It is useful for sweetening rich large cakes, and many varieties of pudding. Demerara is occasionally adulterated. A substitute for Demerara sugar is beet sugar which has been coloured with a vegetable dye.

Barbados is a rich moist sugar, brown in colour. It is, when pure, very good for mixing in with dark coloured puddings, or any description of gingerbread; it is also used for dark toffees, in the pickle made for salted and spiced meats, and in chutneys. It is not suitable for sweetening fruit when cooked, as it imparts an unpleasant syrupy taste, and also spoils the colour of the juice.

A cheap sugar called white moist is sometimes sold, but there is no economy in buying it, as the sweetening principle is very deficient and the quality altogether inferior. Beet sugar is the moist syrupy sugar which lies at the bottom of the hog-head of raw sugar. It was at one time used for toffee. A yellow crystal sugar, not unlike sugar candy, is preferred by some people to the white crystal sugar for sweetening coffee. This is often obtainable in vari-coloured crystals.

Food Value. From the medical standpoint sugar is one of the most valuable foods, because it is a source of body heat and energy. Cane and grape sugar are composed of carbon, hydrogen, and oxygen. Sugar, although obtained chiefly from the sugar cane, is also manufactured from beetroots, carrots, and the sugar maple. Glucose, grape, and starch sugar are found in various fruits; they are prepared artificially from cane sugar, starch, and dextrin. Glucose has not the same dryness as cane sugar, and will attract and absorb moisture. When cane sugar is moist it is often due to the presence of grape sugar.

Milk sugar, or lactose, which is found in milk, and may be separated from it as a fine white powder, is much less sweet than ordinary sugar, but is readily digestible by infants and has a slight diuretic and laxative effect.

Malt sugar, or maltose, is obtained by treating the starch of barley with the ferment diastase. It readily undergoes alcoholic fermentation. It is impossible to lay down any general law as to the amount of sugar which should be included in any particular individual's diet. A point to be remembered is that sugar has a cloving or satisfying effect, so should be eaten at the end of a meal.

A proportion of sugar must be maintained in the blood, and as necessary, glycogen is changed back into glucose and added to the blood stream. The proportion in animal blood is from 0.08 to 0.04 per cent. If the amount in the blood is too high, sugar appears in the urine; but in the condition known as kidney diabetes sugar is apparently able to pass into the urine although the proportion of blood sugar is not raised. Sugar appears to take the place of alcohol and to diminish the tendency to build up a taste for the latter.

The handling of sugar sometimes produces dermatitis of the hands and forearms, a condition which among grocers is called grocer's itch. When unrefined sugar is being handled it is thought the irritation may be due to the sugar mite, an insect which resembles the itch mite, and which occurs in such sugar. Fat children who take an excessive sugar may suffer from eczema.

SUGAR BASIN. The receptacle for sugar may be an ordinary basin, but it is usually more elaborate when sold separately or as part of a tea service. Sugar basins are made in glass, china, pottery, plated metal or silver, in old and modern styles.

Often they are made in plated metal or in silver to match a milk jug and tray in reproductions of Queen Anne and other classic styles. An early form of the sugar basin is the glass bowl sometimes found in a tea caddy. Sugar basins in antique silver and Sheffield plate are valued by collectors. Some early pieces are embossed. Others of a somewhat later date are adorned with pierced and fretted trellis work, a decoration which necessitated a glass lining. This was usually blue in colour, but occasionally crystal. An example of such a basin, or basket, is illustrated in Fig. 1. It has a swing handle and a head edge. In page 1134 a round basket of the same period, but made in Sheffield plate, is shown. Some fine examples are supported on



Sugar Basin. Fig. 1. Example in pierced silver work, lined with blue glass, 1785. Fig. 2. Plated sugar basin on ball foot. Courtesy of Chapple & Mantell

ball and claw feet, or on lion's paw or ball feet. Sometimes the basins were made with covers. Fig 2 shows a fluted sugar basin, with gadroon border, scroll handles, and ball feet dating from early in the 19th century.

SUGAR CANDY. Being a pure and wholesome sweetmeat, sugar candy consists of sugar crystallized and dried in an even, hot temperature. The crystals are formed on sugar, but as special vessels are necessary to do this it is scarcely possible for an amateur to attempt to make it.

SUGAR CASTOR. A sugar castor or sugar decoder is employed to sprinkle castor sugar over fruit tarts, stewed fruits, etc., after they are brought to the table. It is usually very similar in shape to a muffinier, or pepper pot, though larger, and, like a muffinier, is provided with a conical or round, screw-down, and perforated lid.

Sugar castors are frequently made entirely of silver or silver plate. Sometimes the lid alone is of silver, the rest of the castor being cut glass or china. Collectors' examples in silver date from the end of the 17th century. Queen Anne shaped castors were often octagonal, the pierced top surmounted by an octagonal knob.

SUGAR SIFTER. This is a spoon used for sifting sugar. The distinctive point about the article is the perforated bowl by which the sugar can be sifted as it is put on to the food. Sifters, which are usually of silver or electroplate, can be purchased either separately or with a sugar basin.

SUGAR SOAP. This is the name given to a soap or powder form used for washing down paintwork before repainting. It can be had from an oil and colourman. See Paint.

SUGAR STICK. This sweetmeat can be varied by changing the colour and flavour, and it needs to be stored in airtight bottles. Prepare the sticks by dissolving $\frac{1}{2}$ lb. granulated sugar in a little more than $\frac{1}{2}$ gill water, and then adding 3 oz. glucose. Stir the whole in a pan over the heat until the glucose has melted; then heat it up to 200° F., and pour it on to an oiled slide. Flavour with cinnamon, add a little saffron for colouring, and fold the hot candy over and over with a flat wooden spoon, afterwards pulling it out with the hands until it begins to harden. It is then ready to be cut into sticks.

SUGAR TONGS. When the sugar bowl contains pump sugar, small tongs of silver or electroplate should accompany it to the table so that the lumps are never handled by fingers. The two grips ends of the tongs are usually either spoon-shaped or claw-shaped.

SUIT CASE. The lighter types of suit case consist of a plain frame covered with moleskin cloth, vulcanized fibre, brown canvas, green drill or some other material of that kind. The heavier ones are of leather.

A very light weight case has a soft top. Such suit cases are lined with a fancy material or cotton marquette and are made of leather grained cloth or black or coloured oil buze. Expanding cases are serviceable in reliable and stouter makes. Another type is here illustrated. It is covered with vulcanized fibre lined with strong material, and the top is fitted to hold six dresses. The bars come forward, for hanging them. The lower portion of the case is deep enough for shoes and other articles of clothing.

Suit cases are fastened by snaps or locks or both. They are made in a variety of sizes. Small ones are 18 in. long, 13 in. wide, and 5 in. deep, and they can be bought as large as 30 in. long, 17 in. wide, and 8 in. deep.

SULPHATE: The Fertilizer. Salts that are formed with sulphuric acid are termed sulphates. In the garden, three sulphates,

ammonia lime, and potash, are of great value in fertilizing crops. Ammonia can be applied to all kinds of soil, except those containing chalk. It is particularly useful on cold, heavy ground. It should be applied to the soil before planting, but may be used as an after stimulant in liquid form in the proportion of $\frac{1}{2}$ oz. to a gallon of water.

Sulphate of lime, sometimes called gypsum, is an excellent fertilizer, its action being to liberate silex of potash for the feeding of crops. It has the power of fixing ammonia, and is used on manure heaps for that purpose. Sulphate of potash is very soluble, and this quality, in conjunction with its feeding value, makes it invaluable for pot plants, flowers, etc.

One of the poisonous winter washes for the cure of black spot, mildew, scorch, and rust, is made with sulphate of copper, also called blue stone. It is mixed with water in the proportion of 1 oz. to 2 gallons, and carefully applied with a syringe or pneumatic sprayer when growth is dormant. See Bordeaux Mixture; Lime; Potash.

SULPHIDE. Amongst the sulphides the one known as sulphide of potassium, or liver of sulphur, provides an excellent remedy for mildews in garden and greenhouse. It is simply prepared by mixing 3 oz. sulphide of potassium with 4 oz. soft soap, dissolving both separately in water, and adding further water to make up to 10 gallons. The solution must always be used when perfectly fresh. It is applied to mildewed plants during summer. See Mildew; Spraying.

SULPHUR: Medicinal Uses. Sulphur is widely used in medicine as a parasiticide. In scabies or itch sulphur ointment is a very valuable remedy, or the drug may be applied in the form of Vlemmex's solution. In the treatment of other skin diseases, notably acne and dandruff, it is also a valuable medication. Internally, sulphur acts as a gentle laxative, and is often prescribed for children.

Compound liquorice powder, a useful and reliable laxative, owes its action partly to sulphur, which it contains. Sulphur lozenges, containing 5 gr. of precipitated sulphur, one to two at bedtime, are often taken in order to correct constipation, or by the subjects of chronic rheumatism.

The sulphur waters of the natural springs in various parts of the world are used inwardly and as baths for the cure of chronic rheumatism, skin diseases, and a large number of other conditions. A sulphur bath at home is made by dissolving 6 oz. potassa sulphurata in boiling water and adding to a full bath, that is to say, about 30 gallons of water.

SULPHURIC ACID. Oil of vitriol or sulphuric acid is a heavy, oily, highly corrosive liquid which will destroy any animal tissues and many other substances with which it comes in contact.

Sulphuric acid as used medicinally is always very greatly diluted. Externally dilute sulphuric acid is sometimes used to check slight bleeding. Internally dilute or aromatic sulphuric acid may be used to check acute diarrhoea. It is often given as a daily dose, well diluted for those who work in lead, painters, colour grinders, etc., as the acid combines with any lead which has been taken into the system, forming sulphate of lead, which is insoluble and harmless. In general debility, diluted sulphuric acid, either alone or with other tonic drugs, sometimes acts as an effective alternative, improving the appetite and generally bracing up the system. It should not be allowed to come in contact with the teeth.

On account of its violently corrosive effect, poisoning by sulphuric acid is a most painful as well as highly dangerous condition. Violent burning pain from the lips down to the stomach, with vomiting of blood and corroded slabs of tissue and collapse, are the chief symptoms.

While awaiting the doctor, magnesia, chalk, or soda should be given at once, if obtainable, in water, milk, or olive oil. If these substances are not at hand crumbled up plaster from a wall, soapuds, or mortar, mixed with water or milk, should be given. An emetic should not be given. For the pain, poultices or fomentations are applied to the abdomen. If breathing is difficult put cloths wrung out of hot water round the throat and moisten the air with steam by means of a bronchitis kettle.

Afterwards demulcents, such as white of egg, or olive oil, should be given to soothe the inflamed stomach.

SULPHUROUS ACID. On account of its strong deoxidizing action, sulphurous acid is used as an antiseptic, a deodorant, and a disinfectant. The acid is sometimes applied locally in parasitic skin diseases, e.g. ringworm. Sulphurous acid is sometimes given internally to prevent gastric fermentation. The dose is $\frac{1}{2}$ to 1 fluid dram.

SULTANA. A small seedless raisin with a thin rather light coloured skin, the sultana is much used in cookery for adding to puddings, cakes and scones. It is considered to possess a delicate flavour, although it lacks some of the full rich taste of the larger seeded raisin. Sultanas give better results when mixed with other dried fruits except when a plain fruit cake is desired.

Sultana Bread. This is made by sieving together $1\frac{1}{2}$ lb. flour and a pinch of salt, rubbing into them 1 lb. margarine, and then adding and mixing in 5 oz. picked and cleaned sultanas and $\frac{1}{2}$ lb. sugar.

Put 1 oz. yeast into a small warmed basin, mix it with 1 teaspoonful castor sugar until it is reduced to liquid and then add $\frac{1}{2}$ pint warm milk. Strain these into a well made in the centre of the flour, etc., mix in a little of the latter from the sides, then cover the basin with a cloth and let it stand in a warm place for 20 min.

When this is done, mix in all the flour, adding more warm milk if required. Turn the dough on to a slightly floured board, knead it for about 8 min., then put it back into the basin, cover it and leave it to rise in a warm place for about 1½ hours. Turn it out and knead it again for a few minutes, then put the loaf of dough into a greased and floured bread tin.

For the third time, let it rise in a warm place for 20-30 min., then bake it in a hot oven for about 1-1½ hours. When cooked, brush the loaf over with a glaze made from castor sugar and



Suit Case in vulcanized fibre, lined and fitted with bar attachment, over which dresses and skirts may be hung and held in place.

milk, putting it back into the oven for a few seconds in order to dry.

Another recipe, in which yeast is omitted, is as follows: Sieve together $1\frac{1}{2}$ lb. flour, $\frac{1}{2}$ teaspoonful each carbonate of soda and cream of tartar, and $\frac{1}{4}$ teaspoonful salt, then add 2 oz. cleaned sultanas and mix the whole with enough water to make a fairly soft dough. Turn this into a greased tin and bake it in a fairly hot oven for $\frac{1}{2}$ hour. The bread is improved if buttermilk can be substituted for the water.

Sultana Pudding. To make this pudding take 6 oz. sultanas, 5 oz. each of margarine or butter and of sugar, a lemon, an egg, $\frac{1}{2}$ lb. breadcrumbs and some milk. Grate the rind of the lemon and stir this into the bread crumbs. Wash, pick over and dry the sultanas and beat the sugar and the margarine or butter to a cream; to these add the egg, which should be stirred in quickly and beaten for a few minutes. Mix the breadcrumbs and sultanas, adding a little milk as required, and stir the whole well together.

Put this mixture into a greased pudding basin, cover it securely with a well-greased paper, steam it for about 2 hours, and turn it on to a dish. This pudding should be served with syrup sauce. To make this, take 3 tablespoonfuls golden syrup and one tablespoonful each of strained lemon juice and water. Place these three ingredients into a saucepan and boil them together for a few minutes. See Bread Cake, Scone.

SULTAN FOWL. This is a quaint looking white-crested fowl with cheek muffs and a beard. It is heavily feathered on the shanks, the feathering being carried right down to the toes, and is vulture hooked like the Brahma; it possesses five toes, and thus may be akin to the Houdan. The comb is horned. The Sultan is not a large fowl, the males when full grown weighing 5 lb. to 6 lb. and the hens 3 $\frac{3}{4}$ lb. to 4 $\frac{1}{2}$ lb. The hens lay a white egg which weighs slightly under 2 oz. The chicks, which are creamy white, are very hardy, and show the leg and foot feathering immediately they leave the shell. See Fowl Poultry.

Sumach. This is the popular name of a group of ornamental hardy shrubs, known botanically as *rhus* (q.v.).

SUMATRA GAME FOWL. No fowl approaches the black Sumatra game fowl in its richness of colour, which is dense black, with a glossy beetle-green sheen. The head is small and rather short, the eye large and bold, the comb small and pea shaped. The body is broad, with a full-round chest.

The body feather is close fitting, but the bird has long flowing saddle hackles, and the cockerels have a very long drooping tail, with immense side hangers and sickles, which almost sweep the ground. The hens have a large fan-shaped tail. The eye should be red, but is often brown or black, the face, comb and lobes are black, the beak and legs olive green. The bird often shows double spurs. The hens are layers of tinted eggs which weigh $1\frac{1}{2}$ oz. to 2 oz. The Sumatra is a fairly good table bird, the flesh being delicate and having the flavour of game. It thrives best on free range. See Fowl: Game Fowl; Poultry.

SUMMER: In the Garden. Summertime for the gardener officially extends from June 21 to Sept. 29. It is during this period of the year that the fairest flowers, roses, carnations, and lilies, to mention only a few, are in bloom; turf is at its greenest, summer beds are at their brightest, the trees are at their leafiest, and many of the most delicious fruits and choicest vegetables are available.

The summer is also a period for observation. Errors in the lay-out of beds and borders, mistakes in colour schemes, and incongruities in the arrangement of plants should be care-

fully noted, and plans made for alteration or improvement when autumn comes. Plants, the flowers of which show any outstanding qualities in the way of size or beauty of colour or perfume, should be carefully noted for special care and attention when the season for propagation arrives. Indoors the chief trouble is with insect pests, various methods of battling with which are given under many headings throughout this work. See August, Border Garden, Insecticide, July, June.

SUMMER CHAFER. This pest of the rose is similar to the common chafer or May bug, and it feeds in the evening attacking both the foliage and petals of flowers. The only way of dealing with chafers is to seek the pests, during dull days and evenings, amongst



Summer Chafer slightly reduced

the petals of blooms, immediately destroying all that may be found. Seek also in the ground for their fat white grubs that feed on fibrous roots, as well as on the skin of large roots, applying a little sulphate of iron to the soil during late autumn and early spring. If beetles are seen in flight around trees, give a spraying with arsenate of lead. Regular watering must be waged against all garden thistles and their white larva. See Rose Spraying.

SUMMER HOUSES: RUSTIC AND FORMAL

Points to Remember in their Construction and Situation

The amateur is hereby told how to construct a summer house, a choice of styles, design, etc. Other useful information will be found under such headings as Arch, Garden Furniture, Rustic Work, Steps, Thatching, Trellis.

In a variable climate a well-planned and built summer house provides the necessary shelter for long hours to be spent in the garden. Many days, even in winter, can be thus enjoyed, especially if the summer house is of the garden room type, with encaint windows and glass-pannelled door. Where there are children the summer house forms a delightful playroom or nursery, in which they can have the benefit of fresh air in safety, and in hot weather the shelter may be fitted up as a sleeping room or serve as a dining room. Such a summer house to be practical should measure from 8 to 10 ft. square.

The furnishing of summer houses should be plain or rustic in character, according to the nature of their structure. Painted wood or cane, or natural teak wood furniture, fabrics which will not fade or deteriorate with damp, and cottage earthenware or rough pottery meal services are always suitable. Wicker and rustic wood benches, tables and seats are appropriate for the simple type of structure illustrated in Figs. 1 and 2.

The placing of the summer house in the garden is of great importance, not only from the point of view of getting shelter from north and east winds, but also because a pleasing structure of this kind can enhance the design

of the garden. Fig. 1 illustrates the charming placing of a thatched shelter on a southern slope with a background of trees and a foreground of stone steps. The summer house is covered with wavy eared elm-leaving, is rustic in appearance, and in perfect accord with the rock garden which surrounds it.

Delightfully chosen for its surroundings is the summer house pictured in Fig. 2. This is of serviceable size and solid construction, particularly suitable for the formal Dutch garden which it enhances. The tiled roof is supported on stout covered brick pillars, the side windows are glazed and the floor is bricked. A charmingly designed garden seat furnishes the interior, but there is plenty of room for other chairs and a table. Such a diversified type of shelter is suited for a town garden.

For a more open setting Fig. 3 shows another type of equally picturesque summer house, also of quite substantial construction, that built with straw. The opening is framed by the rough hewn posts which support the front. The sides and back are filled in with rustic work. There is a brick floor, and the semicircular space in front is paved with rough hewn timbers.

Another summer house with an open front is shown in Fig. 4. It is built with a tiled



Summer House. Fig. 1. Thatched summer house of rustic appearance, well suited to the rock garden which surrounds it and to the stone steps which approach it.

Humphrey & Vera Jool



Summer House. Fig. 2. Set in a Dutch garden, this formal summer house with its red-tiled roof, brick floor and stucco-covered pillars is an admirably chosen shelter for a town garden.

Humphrey & Vera Joel

framework to allow the weatherboarding to be nailed flush with the outer corners of the uprights, and is supported on a suitable brick or concrete foundation. Hinged casement windows are fitted in front and at the sides. The roof is boarded to overhang in front and at the back and sides, and is supported by rafters fitted against a small ridge board and finished with a capping planed on both sides to the roof angle.

The floor is boarded with 1 in. tongued and grooved boards, suitable joists being placed at intervals of not less than 18 in. The construction can be arranged in sections with a separate floor, to which the front, back, and the two ends, as complete sections, can be bolted. The roof in this case is made in two halves, and bolted to the top framing and joined on top with a capping.

Stock Models. Fig. 5 shows a house which is built up on a square floor supported on a stout foundation provided with a revolving gear. The newest form of this is similar to that employed for locomotive turntables and does not stick through rust or wear. The whole building can be easily turned to catch the sun or to avoid bitter winds. The revolving gear is to be found in the less expensive types of summer house, as well as in the larger structures. The roof of this example is thatched, but though this material is coolest and most picturesque to use, weatherboarding or oak shingles could be substituted. The front of the summer house is provided with two windows (shown shuttered) and a door with glazed upper panels. There are also windows at either side.

Stock models can be obtained of shelters which will suit most gardens. Walls are made of deal or of wavy edged elm boarding, or for a lighter type of shelter are of woven reeds. Some houses are made on a multiple unit system. By this means it is possible to order a shelter which will be of the exact size required when constructed. The units are obtainable in 4 ft. and 6-ft. lengths and in two heights. Each unit can be used as a plain wall, or with a window or door, and multiples or combinations of the units permit of putting up a structure to meet any requirement. Roofs also admit of a variety of treatment. Existing structures may be afterwards extended at small expense and with very little trouble by means of this unit system.

of the shelter. The cross-pieces should project about 9 in. beyond the corner posts. They are fitted by making little flats on the undersides of the cross-pieces, chipping away the round part and securing the cross-pieces with 4 in. or 6 in. nails.

Rafters for the roof can be fixed by first setting up tie bars across the back and front pairs of uprights, and erecting a temporary upright in the middle of them to support the ridge pole, afterwards nailing the rafters to the ridge. The horizontal members are nailed, one near the ends of the rafters, and one in the middle of their length. The work is completed by fixing short uprights from the crossbar to the rafters at each end of the building.

The roof may be covered next. The faggots are most easily fixed with soft galvanized iron wire, wiring the bundles or faggots to the cross-pieces on the roof. The exact method of covering the roof will have to be modified according to the material employed, but if ordinary brushwood is used it can be laid with two layers of faggots. Each faggot is separately wired to the roof, and the whole secured with a further turn of wire. The end of the faggots should be trimmed off with shears or a bill hook.

The cross-pieces between the uprights are fixed at about the middle of their height, and pieces should be nailed from post to post on all three sides, leaving the front open. A cross-piece is fitted near the ground to act as a support for the lattice work which forms the walls or sides. This may consist of poles about 1 in. diameter, nailed to the uprights and cross-pieces with 2½ in. wire nails. They are set diagonally, each panel running in opposite directions, as shown.

Seats are provided on three sides by making gallow's brackets. These are spiked to the uprights, one being fixed to each. The brackets in the angles of the building should be set at an angle of 45° to the side walls to form a support for the poles used for the seats. The top of these seats should be about 18 in. off the ground. The poles are nailed to the tops of the gallow's brackets and overlapped slightly at the angles or corners to give the effect of a mitre.

The back and sides of the summer house can be completed in trellis work, set diagonally. The whole may be treated with wood preservative stain or varnished. In the latter case



Fig. 3. Summer house with thatched roof and heavy rough-hewn supports overlooking a sunk garden in Sussex. The sides and back are of rustic work and there is a brick floor.

Humphrey & Vera Joel



Summer House. Fig. 4. Attractive structure of stained weatherboarding, open at the front and with casement windows at front and sides

the bark will have to be stripped off the timber before it is erected. Some of the harder woods are quite satisfactory if the bark is left on them; with others it is desirable to remove it, but there is no hard and fast rule for this part of the work, and it is largely a question of appearance. Useful hints will be found in the articles Arch and Rustic Work. The same method of construction can be used for a more elaborate structure, taking care that the principal supports have the requisite strength.

SUMMER PUDDING. This is a pudding made from bread and stewed fruit. It is a good way of using up stale bread, and any fruit in season may be used. It is advised specially for those who are unable to eat pastry with fruit. To make it, cut some stale bread into slices rather more than 1 in. thick. Trim off the crusts. Cut one of the pieces of bread into a round to fit the bottom of a greased basin. Measure the depth of the basin and cut pieces of bread to fit. Odd bits can be fitted into any spaces as may be necessary. Cut a second round to fit the top of the basin.

When the basin is lined with bread, pour in sufficient hot stewed fruit to fill it. Any kind will do, but it must be nicely sweetened and not too much of the juice used. Lay the second round of bread over as a lid and put a plate on the top of the basin with a weight on it to press the bread down. Leave it until it is cold, then turn it out on to a dish and serve it plain, or with custard or cream.

SUMMONS. The usual method of compelling a defendant to appear in court is to issue a summons, which he is bound to answer. It is usually issued by the magistrates' courts and county courts. Any one who wishes a summons to be served upon another person to answer a charge should go before the magistrate and make a complaint, which may or may not be taken down in writing and required to be signed by the complainant.

The summons is served by a warrant officer, who is usually a policeman. It orders the defendant to be at the court on such a day at such an hour to answer the charge preferred against him.

A county court summons must be issued at the office of

the registrar of the county court. It is procured by going to the office and filling in a form which will be there supplied, which states what the summons is to be in respect of. There are two kinds of these, ordinary and default. The ordinary summons is issued merely on request and is served by the bailiff of the court. If the bailiff says he is unable to find the defendant, the plaintiff himself, or his solicitor, may ask to be allowed to serve it. See Debt.

SUN BLIND. Sun blinds are blinds fixed to the outside of a window and brought into use during days when there is a good deal of sun. They are

also used for the same purpose to protect doors and in conservatories and greenhouses generally. Rooms, especially those that are exposed to an abundance of summer sun, need the protection of sun blinds, both to keep them cool and to protect their wallpapers, curtains, and other furnishings from becoming faded.

Wooden shutters are sometimes made to serve as sun blinds, and, though effective enough for this purpose, they shut out the light and make a room rather gloomy. Sun blinds also have the advantage of giving the house a bright appearance and can be fitted by an amateur.

The colour for sun blinds should be determined by the colour of the paint or brickwork of the house. Striped blind fabrics are the best choice, as they are obtainable practically fadeless and clean and wear well. If sun blinds are damped by rain, they should be left open until dry, otherwise they may rot.

The box-head spring roller blind is constructed on the same lines as ordinary indoor blinds, except that a boxing of some kind must be rigged up to protect the blind from the elements. A central cord is used to draw the blind down and secure to a cord-holder on the window sill, thus preventing the blind blowing about on a windy day. The blind can be made of striped or any other material that is strong and durable. It is attached to the

blind roller as described for indoor blinds. Japanese rush blinds, in some shade of green, can be fitted in exactly the same fashion.

A sunk porch or entrance door is easily shaded, either with a plain or a spring roller blind attached to the top of the framework over the fanlight. The blind should be long enough to reach at an angle from the fanlight to the front of the porch, where it is secured by a crossbar of wood or metal, inserted through a pocket formed in the material. This rod slides into two eyes or staples let into the brickwork when the width inside the porch is greater than at the entrance. Otherwise it is secured with short lengths of light brass chain. The blind may hang down beyond this rod as much as desired. The rod must be at least 6 ft. above the ground so as not to inconvenience passers-by.

The term sun blind is also used for a rectangular piece of material that is hung in front



Fig. 8. Summer house constructed with ordinary poles roofed with a thatching of willow faggots

of a door during hours of sunshine to protect the paint. For this a strong fabric should be selected, preferably one with green stripes, and the colour should be guaranteed not to fade in the sun. Having been cut and hemmed to the required size, it can be hung by fastening a ring at each of the top corners and placing these upon two hooks put in position above the door. See Awning; Blinds; Window

SUNBURN. It is not the heat of the sun, but the chemical action of the violet and ultra-violet rays which causes sunburn. It has been found that the condition is most likely to result from the early morning sunlight or from the reflected light from water or snow-covered ground. A dry wind also favours its occurrence, as it deprives the skin of its natural moisture. Fair-haired people are affected more readily than dark people.

In the most common form there is nothing worse than browning of the skin, which acts as a protective from the heat of the sun. In severer forms the face becomes red, painful and perhaps swollen. There is tingling and itching, and a few days after exposure the skin peels off. In sunburn of a still greater degree blisters are formed. When people are daily exposed to the powerful rays of the hot sun for a long time the skin is likely to become dry and wrinkled.

For the redness and irritation cooling and soothing lotions should be applied. In the slighter cases a little eau-de-Cologne mixed with three times its quantity of water is very effectual. Rosewater and elderflower water



Fig. 5. Revolving summer house that can be turned round so that the front windows, here shown shuttered, may face the sun
Courtesy of Denton & Paul, Ltd.

are also used. Sometimes an astringent lotion, such as Goulard's water, dabbed on the face and allowed to dry, is most serviceable.

The following will be found an admirable cooling application for the skin after returning from an outing in the sun. It should be dabbed on the face with a piece of lint or very clean rag.

Tincture of benzoin	1 dram
Essence of cologne	1 oz.
Almond milk	2 oz.
Boil water, enough to make	8 oz.

A simple but very efficacious cooling application for sunburn is freshly-sliced cucumber lightly rubbed on. See Complexion. Dermatitis. Face. Freckles.

Sundae. See Glassware. Toe.

SUNDEW. There are three native species of sundew, which is an insect-eating plant and a hardy perennial. Of these the best known is *Drosera rotundifolia*, a low plant with roundish, reddish, radical leaves covered with sticky, shining, glandular hairs, which glisten in the sun. It is found in parts of Great Britain, Ireland and the Channel Islands in boggy places.

Although hardy it is sometimes grown in pots as an interesting greenhouse object. A compost of peat and sphagnum moss is suitable. Propagation is by seed or division. There are several other species.

SUNDIALS: HOW TO ERECT AND SET

A Picturesque Feature for Gardens Large and Small

The earlier part of this article presents the outlines of a sundial, while in the latter our reader is told how one should be set. See Brick; Concrete; Stone; and other entries that deal with the tools and materials used by the amateur worker. Also see Flower Garden; Garden.

A sundial may be fixed vertically on a wall as Fig. 7, but it is generally found in a horizontal position, mounted on a pillar or some form of pedestal like that illustrated in Fig. 1. This is set up in a sunny spot in the garden, in such a position that at midday the shadow of the gnomon falls exactly on the 12 o'clock mark on the dial.

Making a Brick Pillar. Brick is perhaps the best material for the amateur to use. First of all the foundation has to be prepared. If the site selected is on a grass plot, the top soil must be removed until firm ground is reached. This is made up with broken brick or hard core, and coated with concrete floated off to a level surface. The centre panel may be made up with crazy, or random flagstones laid in cement mortar, or the whole of the area can be covered with brickwork.



Fig. 1. Skillful placing of a pedestal: sundial in a long and terraced path

that from which the pillar shown in the accompanying illustrations was constructed.

The worker should refer to the article on bricks for details of the making up of mortar, method of laying the courses, etc. The first course is laid and levelled, and the second course is then set upon the first, half a brick's width less in size, so as to form a stepping.

The bulk of the pillar measures 14 in. square, and is easily built up by arranging the bricks alternately, one brick lengthways and the next at right angles to it. This operation is repeated for three courses, and then the tile creasing is laid in a similar manner, consisting of two courses.

A further three courses of bricks are laid on the tiles, and another tile creasing course. The tiles should be tapped up level to the sides of the shaft by striking them lightly with the handle part of the trowel. They should be well bedded in mortar and pressed down firmly, as indicated in Fig. 3. Two courses of bricks are then laid, to complete this part.

The over-sailing course of bricks remains to be laid on the top of the pillar so that they project over 1 in. beyond the face of the shaft; for this purpose it is necessary to cut a closer, that is, a short piece of brick, to fill the gaps between the whole bricks. The overhang can be measured with a rule or gauged with a small wooden gauge having a notch cut in one edge to represent the amount of overhang. The bricks should be bedded in a thick bed of mortar and well tapped home with the end of the trowel, as shown in Fig. 4.

The capstone can be a piece of thick, flat stone or paving stone, 18 in. square and about 2 in. deep, or in its absence an excellent substitute is obtained by first preparing a rough wooden mould and casting a capping piece in concrete. To provide a means of attachment for the plate of the dial four rectangular pieces of wood are arranged in the centre of the mould before the concrete is tilled in. The mixture is poured into the mould box in a moist condition and the surface should be trowelled off

smooth. Instructions for moulding concrete are given in the article Concrete.

The concrete must remain in the box for a week or more until it has set thoroughly hard, after which it may be removed and placed upon the top of the column, first covering the latter with a thick bed of mortar. When placing the slab, it is important to get a uniform overhang on all sides of the shaft, and to lay the slab flat on top of the brickwork. The slab should immediately be levelled up, by laying a large spirit level diagonally across it, first from one side and then the other, as depicted in Fig. 5, tapping the upper surface of the slab and gradually working it home until it is quite level. It is highly important that the capstone should be perfectly level. The dial itself should be procured before dealing with the capstone so that the correct position of the wooden fixing blocks can be determined. In the case of a brick or stone capping, lead or hardwood plugs are inserted for the fixing screws. Leave the plugs full large, so that there is room for adjustment.

Setting a Sundial. The dial is attached to the top of the pillar by screwing it down with four screws to the wooden blocks embedded in the concrete capping. The gnomon should point north and south with the highest part pointing towards the north.

A sundial made for one particular place is quite useless for another place or a different latitude. Before setting a sundial it is essential to know whether the sun is fast or slow of the clock. Sundials show apparent time, whilst clocks measure equal or mean time, so that if a perfectly regulated clock were set to apparent solar time it would agree with the sundial only on four days of the year.

A solar day is the period which elapses between two successive returns of the sun to the meridian. The moment the sun reaches its highest point in the heavens, that is, the highest point above the horizon, it is true noon. Sometimes the sun is as much as 14 min. 28 sec. after the clock, and at others 16 min. 18 sec. before the

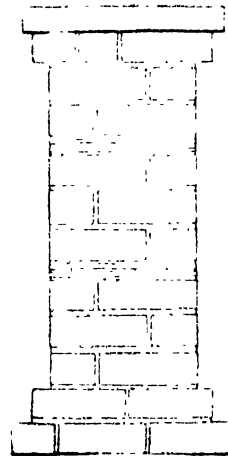
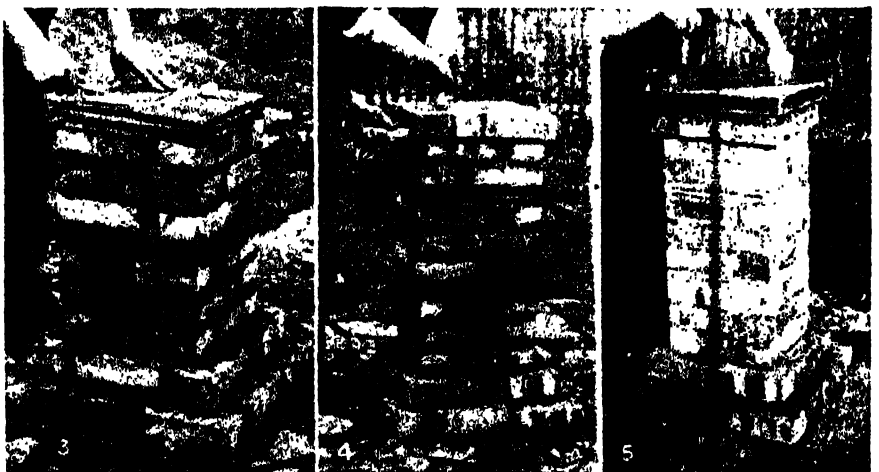


Fig. 2. Showing number of brick courses and position of tile creases in sundial pillar illustrated below



Sundial: stages in making a brick and tile pillar for mounting a sundial. Fig. 3. Second course of tiles being laid. Fig. 4. Laying over-sailing course of bricks at top of pillar. Fig. 5. Use of spirit level when fixing capstone in position; this can be a thick, flat stone or be cast in concrete



Sundial. Fig. 6 (above). Sundial elaborately marked with cardinal points of the compass and ornamental engraving. Fig. 7 (right). Dial plane for a vertical wall surface.

Fig. 6, courtesy of Francis Barber & Sons, Ltd.

clock, at XII o'clock noon. Mean time is that shown by clocks generally, the day of 24 hours being obtained by taking the average of all the solar days of the year. Place the dial upon the platform and move it about until the shadow cast by the gnomon on the dial shows the correct time within a few minutes.

To read the time by sundial, stand on its north side. The forenoon or morning hours will then be on the right hand side of the dial, whilst the afternoon hours will be on the left. At noon the shadow of the gnomon will fall within the space between the two lines at XII o'clock.

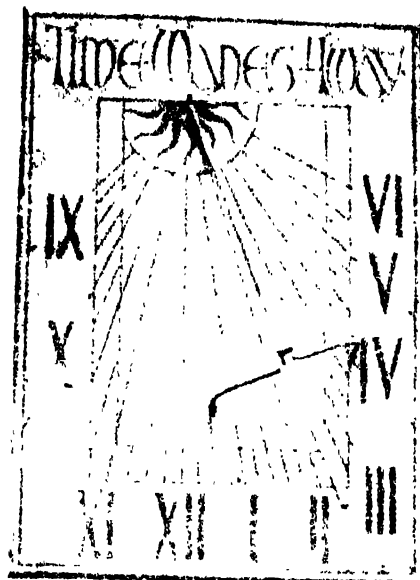
When the dial is in the correct position mark the platform or cap-stone through the holes in the dial for the fixing screws. Finally adjust and fix the dial at XII o'clock noon. Of course it can be fixed at other times, but XII is the best. As before mentioned, the sundial and clock coincide only four times in a year, about April 15, June 14, Aug. 31 and Dec. 25, and it will be found convenient to fix the dial on or near one of these days provided that the sun is shining.

Set a watch to the mean time of the place where the sundial is to be fixed, and a certain, on the day the sundial is fixed the difference between mean and solar time. Say the dial is to be fixed on April 10—the watch having previously been set to the correct mean time of the place, by adding the difference fast or slow of Greenwich—it will be seen that the watch is faster than the time shown on the sundial by 1 min. Move the dial about on its platform until the space between the two lines at XII o'clock is filled with the shadow cast by the gnomon and the watch shows exactly 1 min. past XII o'clock. When correct, firmly screw the dial to its platform.

If the dial is fixed during the period in which summer time is in force, it must be remembered to make the necessary allowance.

SUNFLOWER. There are both annual and perennial sunflowers of considerable value in the garden. The latter plants flourish in ordinary soil and spread rapidly. They ought to be lifted, separated into small pieces, and replanted every autumn to keep them under control. Some of the best are *Helianthus multiflorus*, 4 ft.; *rigidus* and its variety, *Miss Melish*, 6 ft.; *Golden Monarch*, 6-8 ft.; and *Soleil d'Or*, double, 4 ft.

The annual sunflower (*Helianthus annuus*), which bears enormous circular flowers on stems, 6 to 8 ft. high, is a familiar plant in



cottage garden, but the newer sorts, 3 or 4 ft. high, with smaller yellow and reddish flowers which are more valuable, are less grown. The annual sunflowers are raised from seed sown in spring. See *Practical Sunflower*.

Sunlight : In Medicine. See Heat Stroke, Light, Rickets.

Sunstroke. See Heat Stroke.

SUPERHETERODYNE RECEIVER. It is the superheterodyne principle of reception which has made possible the inexpensive wireless set having a high order of selectivity and considerable range. It has also assisted in bringing the reception of short-waves within the province of the ordinary listener by eliminating the delicate separate reaction control.

A superheterodyne receiver is in a continuous state of oscillation, as would be a set employing an ordinary tuning and reaction system if the reaction control were left turned full on all the time. This oscillation is combined with the energy received from the broadcasting station and the resulting "beat" effect is amplified

and then rectified for passing to normal low-frequency amplifying circuits. The "beat" effect occurs when two sound frequencies are combined. The two engines of a double-engined aeroplane can often be heard to produce a low, throbbing note. This is a "beat" note.

The advantage of the principle as applied to radio is that a high frequency current of one constant frequency is derived from the energy of any broadcasting station by combining it with a "local oscillator" in the set. No reaction adjustment is needed, and subsequent high frequency amplification can be carried out with fixed tuning intermediate amplifiers, that do not need tuning adjustments as with different stations. Also the H.F. amplification can be carried out much more efficiently at the lower frequency.

It is very advisable to fix a conventional stage of high frequency amplification preceding the "first detector" or "mixing circuit" in order to reduce interference from atmospheric and other forms of electrical disturbance to which the "superhet" is otherwise rather susceptible owing to its sensitive nature.

A simple superheterodyne circuit is as follows. First, a normal high frequency amplifying stage using a high frequency pentode or screen grid valve. This is followed by a pentode valve which combines the functions of "oscillator," "mixer," and intermediate frequency amplifier. Further intermediate amplification can be provided by an H.F. pentode. There may be a double-diode triode valve for applying automatic control and for converting the H.F. current into L.F. current and amplifying at low frequency. The final valve may be an L.F. pentode or a triode output type. In a means "superhet" there will also be a rectifier valve or a metal rectifier. See Heterodyne.

SUPERPHOSPHATE. In garden parlance this is the valuable mineral preparation superphosphate of lime. It is obtainable in three qualities, viz., ordinary, containing about 25 per cent soluble phosphates, concentrated, embodying up to 45 per cent, of the same essential plant food, and double, a grade in which soluble phosphates as high as 80 per cent often appear. For ordinary farm and fruit crops the first named is quite



Sunflower. Left, dark-centred blooms of the common annual sunflower. Right, double perennial variety.

suitable. The concentrated may be used for more exacting culture, but for special classes or specimen plants the double grade is best.

As superphosphate contains only phosphoric acid, other essential plant foods must be supplied by using potash and nitrogenous manures, and when used in suitable quantities the mixture gives the best results on general crops in most soils. A good average quantity to use is 2 to 3 oz. per sq. yd. Unless required for immediate use, superphosphate should not be combined with nitrate of soda, and it is not advisable to apply it to acid soil. See Manure.

SUPPER. In many households where a hot dinner is cooked in the middle of the day, and usually on Sundays, supper is served in the evening in place of a more formal meal. Except in warm weather, when all cold food may be preferred, soup and a hot fish or savoury dish are generally liked, with a cold joint, meat pie or galantine and a salad on a table or sideboard for those who want a more cold meal. Any cold sweet, such as a jelly, stewed fruit and custard, blancmange or pastry, is suitable for supper, with cheese and biscuits to follow, unless the savoury chosen contains cheese. Coffee is sometimes liked, or the usual cold family beverages.

Entertainment suppers are nearly always cold, unless hot soup in cups is served, or there are facilities for cooking special hot dishes as required. Mayonnaises, game, poultry, galantines and terrines, salads, cold savouries such as stuffed olives or caviare-prawn cretons (see page 206), creams, fruit jellies and other sweets, all kinds of ices, and every variety of dessert are suitable refreshments. When served at a big party, the dishes are placed down the length of the tables in the dining room in order that the guests may help themselves, servants (or waiters engaged for the occasion) standing behind the table to assist as required. Cocktails may be a feature at the opening of the party. Champagne and other wines are provided at a smart supper, and various cups, other cool drinks, and hot coffee.

Where a number of guests are entertained and the staff is small, the buffets and tables should be well arranged so that many people can help themselves at the same time without a scramble. A good idea is to have all the cutlery laid out on a first table with plates piled in three various sizes. The guests take what they require and proceed to the buffet where the food is laid out within easy reach. Drinks and glasses are placed on another table, and service is further facilitated if there are a number of small tables and chairs placed well apart from the buffet.

Small Suppers. More intimate, set down suppers for a small number of guests may be given after a theatre or on a Sunday evening. A prettily decorated table is an important factor. A summer supper for such a party might consist of grape fruit, salmon mayonnaise, galantine of chicken, cold veal and ham pie, strawberry tarte, meringues filled with ice cream, hock or omelette. A winter menu could consist of soup, oyster patties, hot cutlets and vegetables or salmida of game or chicken en casserole, with some cold meat dish and celery salad, little fruit jellies and cheese straws. Any cold savoury or sweet should be prettily decorated and arranged on a suitable dish.

A chafin dish is an admirable aid at such a party, as it enables the hostess to cook a variety of appetizing little dishes at the table. Omelettes of any kind, various fritters, scrambled eggs with anchovies laid across the top, and other savouries can be ready in a few minutes. If food has been prepared and cooked beforehand it can be kept hot on a food warmer, the necessary heat being supplied

through a flexible tube connected to a gas point. An electrical contrivance is a table cooker which can be put over a large plate on which has been previously placed the sausages, cutlets, or anything else of the kind which it is desired to cook. The current is then switched on to cook the food. When done, the food can still be left under the cooker to keep hot for quite a considerable time after the current has been switched off.

SURF BOARD. Flat piece of wood, 5-6 ft. long, slightly rounded and curved upwards at the front, used on open beaches by bathers for riding shorewards on the crest of waves or surf. The rider can be flat on the board or stand upright. Sometimes the board is towed by a motorboat, the rider standing upright and steadying himself by holding cords fixed to the front of the board. Surf-riding was introduced into Australia from Hawaii, later to Great Britain.

SURNAME. A surname is the name which a person has or adopts in addition to the fore-name which was given to him at his christening or which he was registered as possessing. Anybody may adopt any surname he pleases without permission, except an alien, who may not change his surname without the leave of the Home Office.

Nobody has any right to adopt a surname with intent to deceive. If he does, the true owner of the name, if able to prove damage or likelihood of damage to himself or his business, may obtain an injunction. See Name, Naturalization.

SURTAX. This is an additional income tax, and in Great Britain is levied on all incomes, whether earned or unearned, that are in excess of £2,000 a year. In estimating the total income of an individual for purposes of surtax, the amount taken is the full gross amount of the income without any deductions for earned income and other abatements, and before deduction of income tax proper. This means that a man with an income of £2,400 must pay surtax, although, owing to allowances, he is only liable to pay income tax proper on perhaps £1,700.

Surtax is charged on incomes exceeding a figure fixed by the annual Finance Act and is payable in addition to the ordinary income tax. The rate of surtax increases with the amount of income, and is payable only by individuals and not generally by corporate bodies such as companies.

The rates of surtax in force for 1952-53 are given below.

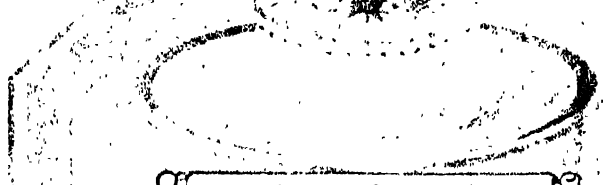
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Tomato Egg



Tomato Jelly



Twelfth Night Cake



Tangerine Jelly



Tangerine Baskets



Stuffed Tomatoes



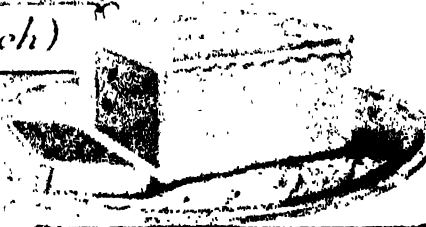
Turbot Timbales



Trifle (Rich)



Trout



Tennis Cake

RECIPES: A SELECTION SHOWN IN ACTUAL COLOUR

Tomato Egg. Wipe some large firm tomatoes. Cut off a slice, then 1/2 of each and scoop out some of the pulp. Season and sprinkle grated cheese over inside, and place in puffing pan. Carefully dip a small egg into each, season again, cover with a mixture of grated cheese and crumbs fried in butter, and cook in oven until eggs are set and tomatoes soft. Serve on cruet. **Tomato Jelly.** Fry two shallots in a lump of butter about the size of a hen's egg. Add 2 lb. sliced tomatoes and salt and cayenne to taste. Cook slowly until vegetables are tender, then rub all through a sieve and put back to pan with 1 oz. gelatin previously dissolved in 1/2 pt. water. Bring to boil and pour into mould to set. Just before serving sprinkle with a little grated cheese. **Twelfth Night Cake.** Made as Christmas Cake. See p. 172. **Tangerine Jelly.** Dissolve a pint packet orange jelly in 1 pt. hot water and put thin coating of it at bottom of shallow dish. Peel 4 tangerines, quarter them and remove pith and pips. When jelly in dish is set, dip some of tangerine quarters into remainder of jelly, arrange all round edge of dish and leave to set. Cover with more jelly and continue layers until dish is full, with jelly to final layer. Mix 1/2 gal. cream with a sprig of cast sugar and a few drops vanilla flavouring. Whisk until stiff and pile in middle of jelly. Place pieces of bread may be used as garnish. **Tangerine Baskets.** Cut neat round hole in tops of some tangerine oranges and scoop out inside without damaging sides. Whip 1/2 gal. cream with a few drops of tangerine orange essence, and stir in also a little grated rind and cast 1 sugar to taste. Fill cases with cream, heaping up slightly on top. Use angelica to form handles. See under Tomato, Timbale, Trout, Tennis Cake, Trifle.



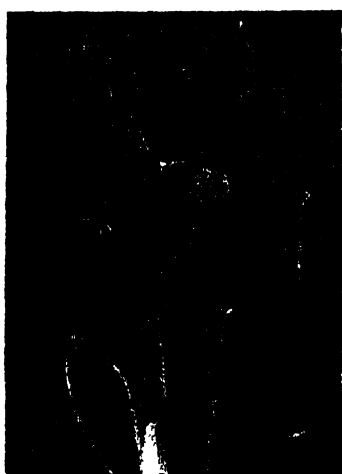
Faerie Queen



Velvet King



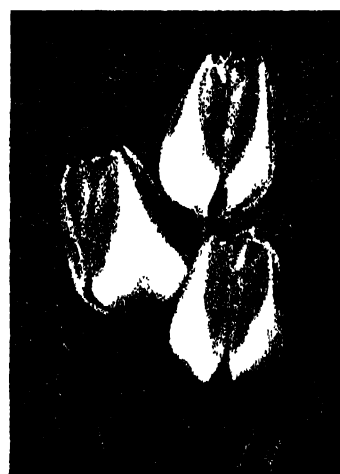
Rembrandt Tulip



Parrot Tulip



Pink Beauties



Cottage Maid



Keizer Kroon



Bishop



Bronze Queen

*TULIP—SOME VARIETIES OF THIS SPRING FLOWERING LILIE
In touch as for general culture, see page 1229, the leading Tulip*

were used for basketwork and other styles of greater delicacy, and out of this industry has arisen a distinctive type of art pottery known as rustic ware. See Pottery.

SWAG. In furniture a swag is a garland or festoon suspended between two points. It was used by the Adam brothers and their successors on curved, inlaid, and painted pieces of furniture, and is seen a great deal in all kinds of decorations of the latter part of the 18th century. Many chair backs by Hepplewhite and Sheraton have swags, and swags are also a frequent ornament on painted tables of that time. See Adam Style, Queen Anne Style.

SWAGE. When finishing iron while it is hot blacksmiths use a tool known as a swage. There are several forms, but essentially they all consist of a form of hammer head or some other face which has a $\frac{1}{2}$ round groove across it. Swages are generally used in pairs. One, known as the bottom tool, has a shank which fits into a hole made for that purpose in the anvil. The upper tool is held with an iron rod handle, which is grasped by the smith in the right hand while the work to be swaged or rounded is held in the left hand.

The metal is brought up to the correct heat, and roughly rounded by hammering in the ordinary way. After this treatment it is reheated, if necessary, and rested in the groove in the bottom tool. The top tool is then placed into position on the upper side of the work, and an assistant strikes the top tool a more or less heavy blow with a sledge or other hammer, according to the size of the work. At the same time the smith partially revolves the metal between each hammer-blow, thus ultimately rounding off the metal and working it up to a smooth surface. If carefully done, tolerably good rods can be made in this manner.

Instead of using the bottom tool, a large rectangular block, which has grooves across its edges, is often used. It is known as a swage block.

SWALLOW-WORT. Thecelandine (*Chelidonium majus*) has been given this name because its flowers open about the time when the swallow arrives, and the drying-up of the plant takes place when the bird is departing for warmer climes. It is useful for shady garden corners.

It has an old reputation as a cure for warts, and as a remedy for scorbutic eruptions.

SWANSDOWN. Because of its extreme softness the down or under plumage of the



A posset cup in Sussex pottery, a distinctive red ware, with date stamped in white.

the water until it is clean, and dry it before the fire, shaking it all the time to restore its original fullness.

SWANSEA WARE. All kinds of pottery and soft paste porcelain fabrics were produced at Swansea for more than a century down to 1870. During the 18th century the styles included salt glaze, cream ware, black basalt, gold and ruby lustre, and printed ware, which was done both in dark and in light blue, and also in both black and brown.

A so-called opaque porcelain or china decorated with fine bird and flower paintings is highly prized by collectors. This opaque china is not true porcelain but a fine white earthenware fabric. An example is illustrated of a bough-pot with a beautifully painted floral pattern. A bough-pot was a vase originally intended to hold flowering boughs, and the term is also spelt bow-pot and used for a pot on which a floral design was painted.

For a few years a translucent porcelain was made. The decorations resemble those of contemporary Staffordshire fabrics, but the body contained no feldspar, and was consequently very soft. Later on the paste used was harder, at first with a greenish tinge, and afterwards a dead white glaze.

Some of the pieces decorated at Swansea by Nantgarw painters were marked Nantgarw. At a second factory, established at the same time, cow milk jugs and milkmaid figures were

swan is the most popular material for powder puffs, but it is also used for trimming purposes on dressing gowns and jackets and on babies' bonnets. It can be bought in white and pale colours and is obtainable in pieces of a suitable size for puffs or as a trimming by the yard in narrow strips.

Swansdown should be washed in warm soapy water. The lather is best produced with soap jelly; for, like many other delicate materials, swansdown suffers if rubbed with soap. Squeeze it gently in

turned out and exported in large quantities to France. Etruscan ware, so marked was made of a local red clay, with classical figures in enamel colours. Another factory turned out useful services in pure white.

It was at Swansea that the Cambrian ware was produced. The usual mark, stamped or stencilled, comprised one or two tridents, with the place name and sometimes the potter's name, such as Diliwyn & Co., or Bevington & Co. Pottery is still made in the neighbourhood of Swansea. See Cambrian Ware.

Sweat. See Perspiration.

SWEATER. This heavy type of jersey is made in various sizes both for men and boys, the chest measurement being the usual standard. Sweaters are made as a rule of white wool, but sometimes colour is introduced at the neck and as a border. Sweaters in variegated colours are occasionally seen and they are made with club or regimental colours at neck, wrists and waist. These are worn by members of cricket and football clubs. As regards pattern, some are made with a collar and some without. The collar may be of the roll or turn down variety.

The knitted garment known as the pull-over is a kind of sweater. This is worn by men and boys and is sold in a variety of colours. Most of them have two pockets, some have a decoration around the neck and elsewhere while others are quite plain. They are also made in check patterns in two colour mixtures, in three colour stripes, and in other patterns. Stockings to match may be knitted, or are sold with many of these garments.

How to Knit. To knit a useful, standard type sweater with a V-shaped neck the requisites are 18 oz. of Bechee fleecy wool, two No. 7 and four No. 10 bone knitting needles, pointed at both ends. The garment should be worked at a tension to produce about 5 stitches and $7\frac{1}{2}$ rows to the inch measured over the plain portion. For the back cast 96 stitches on the No. 7 needles. 1st row: Knit 4, * purl 2, knit 2. Repeat from * to the end of the row, always slipping the first stitch through out. Repeat this row 20 times. 22nd row: Knit plain. 23rd row: Knit 2, purl to the last 2 stitches and knit 2. Repeat these last 2 rows until the work measures 30 in. from the beginning. Cast off 26 stitches at each end, and leave the 44 stitches at the centre on a No. 10 needle.

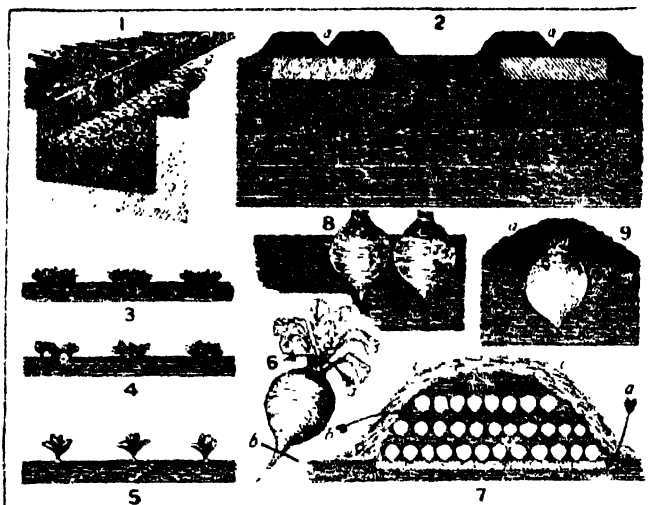
The front should be worked exactly like the back until it measures 22 in. finishing with a purl row. Then begin to shape the neck as follows. 1st row: Knit 45 and then turn. Leave the remaining stitches for the second half of the neck. Continue in the pattern, decreasing once at the neck end of the needle in every third row until only 36 stitches remain, then cast off. Taking the needle where the stitches are left, slip the first 6 stitches, at the centre of the front, on to a No. 10 needle, and, on the remaining stitches, knit the second half of the neck to correspond with the first.

To make the sleeves, cast on 76 stitches. 1st row: Knit 4, * purl 2, and knit 2. Repeat from * to the end of the row. Repeat this row 30 times. 32nd row: Knit plain. 33rd row: Knit 2, purl for the last 2 stitches and knit 2. Repeat these last two rows throughout the sleeve and increase at the beginning and end of the 7th, then every following 6th row until there are 7 increases at each side of the work. Then knit without shaping until the underarm seam measures 18 in. without the cuff and cast off loosely. To make up the sweater, press each of the pieces carefully. Sew up the shoulder and side seams, leaving 9 in. for the armholes. Sew up the seams of the sleeves and then fix these latter in the armholes, placing seam to seam.

To make the collar, with the No. 10 needles knit the 44 stitches that were left at the back



Swansea Ware. Bough-pot of "opaque porcelain," a species of white earthenware, with a painted design of birds and foliage.



Swede. 1. Soil preparation: bottom spit broken and manured (a) for sowing. 2. Raised drills (a) for sowing. 3. First thinning. 4. Second thinning. 5. Final thinning. 6. Swedes prepared for storing by wrenching off tops (a) and cutting off tap-roots (b). 7. Properly prepared clamp: a. sand; b. soil; c. straw; 8. Swedes planted close together to provide green tops during winter. 9. Swedes covered with fine ashes (a), through which green tops sprout by special arrangement with Amateur Gardening.

of the neck. Follow on with a second needle, and knit up 29 stitches at the side of the neck and 3 stitches off the extra needle. With a third needle knit the next 3 stitches and knit up 29 stitches at the other side of the neck. Knit 16 rounds in rib of knit 2 and purl 2, increasing 4 stitches in the first round at the centre of each of the second and third needles. Cast off loosely. The collar can be made to look very effective by introducing stripes of a second colour. See Knitting: Wool.

Sweating: Of Metals. See Soldering.

SWEATING POWDER. In commencing colds and other febrile disorders 5 or 10 gr. of Dover's powder may cause more or less profuse perspiration, and thus diminish the fever. This may sometimes bring the malady to an end. The best time to take such a powder for a cold is at bedtime, and great care should be exercised next day to avoid exposure. Other drugs, such as phenacetin, antipyrin, and antifebrin also act as sweating powders and reduce temperature, but they are not safe remedies for this purpose, on account of their depressing action on the heart. See Fever.

SWEDE. The Swedish turnip has been generally accepted as a turnip crop, but its value as a winter vegetable is now recognized, and seedsmen offer selected strains suitable for growing in the vegetable plot. Its culture is the same as for turnips, but owing to stronger growth rows should be 18 in. apart keeping the soil well hoed and free from weeds during summer.

How to Cook. As a vegetable the swede is usually boiled in the same way as ordinary turnips, after being peeled and cut into quarters or smaller pieces. These are put into a saucepan of salted water and allowed to boil until tender, which may take anything from 30 to 45 min. Serve in a butter, covered

with melted butter (or margarine) sauce.

To serve swedes mashed, boil them in the same way, then rub them through a sieve. Empty the saucepan of water, and put into it a piece of margarine the size of a walnut. When this is melted stir in a little flour, then, before it browns, add the mashed swede, well seasoned with salt and pepper. Stir this a minute or two, and it is then ready to serve. See Sauce: Turnip.

SWEEP. When chimneys require sweeping the sweep should be notified some days before hand, especially in the spring, when he is in much demand. It is usually found most convenient to select an early hour, and to make the necessary preparations overnight. The sweep often charges a flat rate for all chimneys except a kitchen one, which costs more. These rates are charged on the understanding that he keeps the soot, if the employer wishes to keep it for the garden, the sweep's charge will be increased accordingly.

The room in which the chimney is to be swept should be covered down, unless the vacuum method is used. All ornaments should be removed from the mantelpiece, etc., and the shelves covered with newspaper or dustsheets. The furniture also should be covered up. See Chimney: Spring Cleaning.

SWEETBREAD. These delicate portions of meat consist of the heart sweetbread and the throat sweetbread, and are usually sold in pairs. Both calf's and lamb's sweetbreads can be used and occasionally those of the pig.

It is necessary that they should be very fresh, and before cooking they must be soaked for three or four hours, taking care to change the water occasionally. After soaking, which not only cleanses them from blood, but whitens and renders them more delicate, they must be parboiled for 5 min., then immersed in cold water. This process is known as blanching. Pieces of sinew and gristle are then removed.

They should now be wiped, and pressed between two plates; pressing them will improve the shape and make a neater dish.

To roast sweetbreads, take a pair of calf's sweetbreads and prepare them according to the foregoing directions, then brush them over with beaten egg and roll them in seasoned breadcrumb. Have ready melted in a saucepan 1 oz. butter, and sprinkle this over the coating of crumbs, then roll the sweetbreads in breadcrumb a second time. Put them into a baking tin in which 2 oz. butter or margarine have been melted, and place them to roast in a moderate oven. They will take 30 min. to cook, and should be basted frequently with the fat in the pan. Dish them up garnished with fried parsley, and serve with them a good white or béchamel sauce.

Another entrée can be made by the following recipe. Prepare a pair of calf's sweetbreads, and cut them in rather thick slices. Put these in a stewpan, and just cover them with white stock. Add seasoning of salt and cayenne, and sprinkle in a little powdered mace. Add 2 oz. butter and a wineglass of sherry, also 1 teaspoonful lemon juice. Stew very gently till the slices are cooked, then beat up the yolks of 4 eggs with another glass of sherry or $\frac{1}{2}$ gill cream. Add these to the contents of the saucepan, and stir over the heat till the whole thickens, without letting it boil. Serve very hot, garnished with a border of cooked green peas, and just before sending to table squeeze orange juice over the dish.

Sweetbread Fricassée. A very good lunch can be made with either calf's or lamb's sweetbread. If calf's breads are used, procure 1 pair, if lamb's breads, buy from $\frac{1}{2}$ lb. to 1 lb. Prepare the breads by soaking, parboiling, and pressing, then cut them into neat slices. Have ready 1 pint white stock, add 1 onion, 1 carrot, and a bouquet garni. The onion and carrot must have been prepared and cut up small. Stew the sweetbread in this for 20 min.

Meanwhile melt 2 oz. butter or margarine, add $\frac{1}{2}$ oz. flour, and cook together, without browning, for 4 min. Remove the slices of sweetbread from the stock in which they were cooked, then strain it, and add it by degrees to the white roux in the pan. Make it into a smooth sauce, then whiten it with 1 gill cream, or milk and cream mixed, and the yolks of 3 eggs beaten together. The sauce must not be allowed to come to the boil after the eggs are added. Mix in the slices of sweetbread, season to taste, add a pinch of powdered mace and 1 teaspoonful lemon juice, and serve garnished with croûtons of fine bread and small rolls of fried bacon.

If no stock is available, cook the pieces of sweetbread in water, and in another pan put 1 pint milk with a prepared and sliced onion and carrot, a bouquet garni, and seasoning. Stew these gently while the sweetbreads are cooking, and then strain the milk and use it for making the sauce in place of stock.

Sweetbread Fritters. Lamb's sweetbreads make excellent fritters. First prepare them as already directed, then cook them in a little stock or milk, well flavoured with vegetable and seasoned. Then cut them in slices about $\frac{1}{2}$ in. thick, dip each piece in a very light batter, and fry them a golden brown in deep fat. Drain well, and garnish with fried parsley.

Sweetbread Omelette. To prepare this, make a plain omelette according to the directions given under the heading omelette, and before folding it over put some sweetbread, broken into small pieces and reheated in a little béchamel sauce, in the centre. Serve at once in a hot dish. See Sauce.

SWEET BRIAR. Flowering in June, rose pink in colour, with brilliant red berries in winter, the sweet briar or egantine is



Swede. Fine roots of this variety of turnip, a warm winter vegetable



Sweet Briar crossed with other roses resulted in the beautiful Penzance briar seen here

noted for the spicy fragrance of its leaves. The perfume emanates from the glandular hairs on the underside of the serrate leaflets and is particularly fragrant after rain. Botanically, the plant is *Rosa rubiginosa*.

The sweet briar grows wild in the chalk hills and heaths of S. England, as well as in Scotland and Ireland. It forms a delightful hedge for an inner garden. The beautiful large flowered *Penzance* briars were raised by cross breeding between the sweet briar and other roses. See Rose.

SWEET CHESTNUT. This is an alternative description for the Spanish chestnut. The chestnut wood used for furniture and other articles is obtained from this tree, not from the horse chestnut, and the same tree produces the nuts which are the chestnuts used for food. See Chestnut; Spanish Chestnut.

SWEET CICELY. This plant is a species of myrrh native to England, known botanically as *Myrrhis odorata*. It is a fragrant perennial herb, with graceful feathery foliage and large umbels of creamy flowers. Ordinary soil in any position suits it, and it planted during spring or autumn it will thrive in the shrubbery or wild garden.

SWEET GUM. The hardy, summer-blooming tree that is known as sweet gum or liquidambar has handsome, lobed, maple-like leaves that assume a brilliant colour in autumn. The kind best suited to gardens in this country is *Liquidambar styraciflua*. It thrives in ordi-

nary soil and is increased by seeds or layers. The sweet gum tree attains a height of 50 ft.

SWEET HERB. Parsley, bay leaves, marjoram, thyme, sage, savory, mint, and basil are the sweet herbs most frequently used in cookery. When, as in recipes for stews, etc., the use of a bunch of sweet herbs is recommended, only the first four, tied together with the parsley on the outside, are usually chosen. Sweet herbs can be used fresh from the garden, dried and stored at home, or purchased in packets and bottles. See Mint; Sage; Thyme.

SWEET MARJORAM. This is the culinary herb botanically known as *Origanum majorana*. The common marjoram, *Origanum vulgare*, is correspondingly fragrant, and is greatly favoured as a bee flower. Sweet marjoram thrives in rich soil where the position is sunny. Shoots for drying may be gathered just when they are coming into flower. *Origanum dictamnus*, which bears pink hop-like flowers, and is known as pink hops, is a very pretty pot plant for the greenhouse. See Marjoram.

SWEET PEA. This is the joy-blossom of all hardy annual flowers and a great favourite for cutting. It is grown in immense quantities for market, and is an ideal flower for amateur gardeners. If well grown it will yield four-bloom stems throughout many weeks. In recent years numerous beautiful varieties with frilled flowers of delightful colouring have been raised.

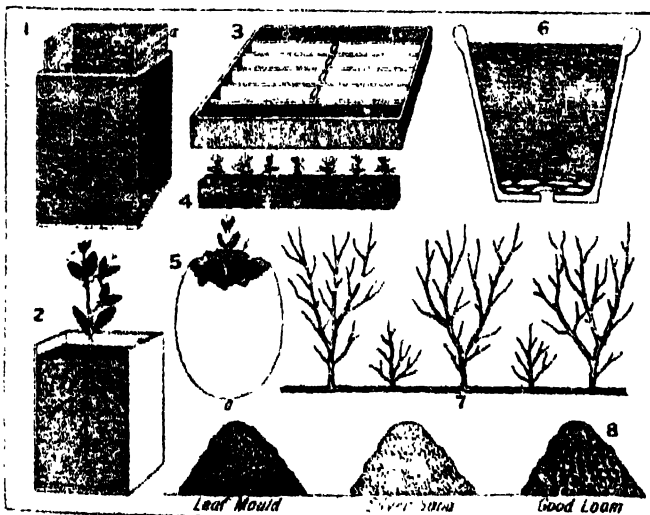
Seeds are sown in pots or boxes in a frame during October, or in a slightly heated greenhouse in January. During the cold weather the seedlings need only to be kept safe from frost, in mild weather



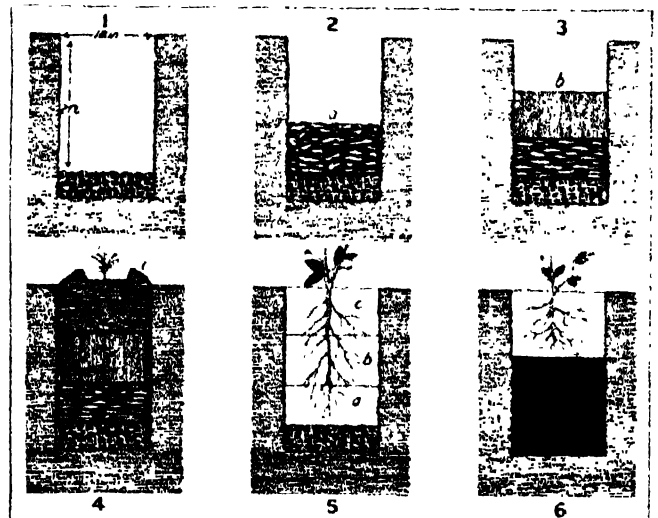
Sweet Pea. A four-bloom stem of a modern frilled variety

stry to protect them from birds by means of netting for a few weeks after they show through the soil.

Some specially pleasing varieties include the following: *Model*, white; *White Joy*, cream; *Valentine*, blue; *Pinkie*, pink; *Mrs. A. Searles*, cerise; *Youth*, white with pink edge; *Magnet*, cream-pink; *Blue Bird*, purplish-blue; *Warrior*, maroon; *Huntsman*, scarlet; *Mammoth*, orange scarlet; *Scot*, Queen, white; *Glenoughie*, lavender; *Wom-*



Sweet Pea. 1. Sowing in matchbox: end removed at a. 2. Inner box with seedling ready for planting out. 3. Large box with removable divisions (a, a) for sowing. 4. Strips of turf (grass downward) for use in same, showing seedlings lifted and ready for planting. 5. Seed grown in eggshell: drainage hole at a. 6. Sowing seed in large pot. 7. How to place supports. 8. Ideal compost for sweet-pea seedlings



How to grow Sweet Peas. 1. Trench opened and bottom soil broken up. 2. Trench left open for manure or accumulation of vegetable refuse (a). 3. Second spit (b) restored after treatment with superphosphate. 4. Top soil (c) replaced with seedling planted out. 5. Result of soil preparation: a. primary roots feeding on top soil; b. secondary roots fed by superphosphated second spit; c. roots gaining stimulation at flowering time from nourishment and moisture. 6. Ordinary cultivation: roots striking poor soil when feeding and moisture are essential

the frame or greenhouse must be ventilated freely. On light soil sweet peas may be sown out of doors at the end of September. When the seedlings are 4 or 5 in. high the tops should be pinched

bley, lavender; *Royal Purple*, purple; *Charity*, crimson; and *Ruffled Rose*, rose. **SWEET POTATO.** A tuberous-rooted plant, the sweet potato requires greenhouse cultivation. Seeds are sown in February in a compost of loam and decayed manure. It is a native of S. America, where it is called *batata*. **How to Cook.** Roasting is the best method of cooking these potatoes. Lay the potatoes on a shelf in a hot oven, turning them occasionally

until soft when pressed gently. Scrape off the outer skin, slice, and toss in margarine, or mash with margarine, and serve hot. They can be boiled as ordinary potatoes.

Sweet Potato Fritters. Peel, boil, and mash 1 lb. potatoes, add to them 2 oz. warmed margarine, 2 tablespoonfuls flour, 3 eggs, and a little salt. Mix stiffly, and form into round,

flat cakes. Coat with egg and breadcrumbs, and fry in deep, hot fat. Drain well, and sprinkle with castor sugar and powdered cinnamon. Serve hot, as a sweet.

SWEET ROCKET. The old-fashioned hardly perennial plant *Hesperis* is also known as rocket, dame's rocket, double rocket, and dame's violet. See Rocket.

SWEETS AND SWEET MAKING

Recipes for Some of the Most Popular and Wholesome Kinds

In connexion with this general article on candied sweets are those on the two important confectionery sections of Chocolate Making and Fudge. There are as well supplementary articles in our work, e.g. Almond Rock, Fondant, Ludge, Ma su Mallow, Nougat, etc. See also Browning, Crystallized Fruit, Essence, Ice-cream, Sugar, Syrup, Vanilla.

The word sweets, or candies, is used to describe a great variety of small confections in which boiled sugar is the main ingredient. The materials include flavouring agents such as almond, peppermint, lemon, and coconut, while use is also made of fruit juices and nuts. Colouring matter, which in the case of the cheaper sweets may be injurious, is employed. One large group of confections falls into the class known as chocolates (dealt with under the heading Chocolate Making); others may be classed in a number of ways, such as toffees, fudges, nougats, fondants, fruit jellies, etc.

Sweets should not be given just before meals, or they may spoil the appetite for plain, but very necessary, forms of food. It is not a good plan to give children sweets just before going to sleep, for the reason that the sugar clings to the mouth throughout the night and encourages the growth of bacteria which may damage the teeth.

It is necessary to add that there is one type of child from which sweets should be withheld, or at most given very sparingly, and that is the fat, flabby child showing a tendency to eczema. Again, if a child exhibits a capricious appetite or suffers from indigestion, a doctor's advice should be obtained as to the propriety of allowing sweets. The sweets given to any child should be of the purest quality.

Outfit for Sweet Making. Very little initial outlay is involved in making sweets at home. All that is required to start with is 2 or 3 pans sufficiently deep to hold the requisite amount of sugar, a stirrer or spatula (these may be had in various sizes in wood and metal, and are flat-shaped without a spoon-bowl), a few shallow dishes or tins into which to pour the finished confection, a sugar-boiling thermometer graduated to 400 deg., a small marble slab, and a pulling hook for rock making.

In the trade, copper pans are mostly used, owing to their high conductivity of heat, but quite good results can be got with aluminium pans. Do not use enamelled ware, as the high temperature at which sweets are boiled may crack the enamel. Tin-lined copper pans should not be used as the tin may be melted during the process. A tin or aluminium scraper for cleaning the slab, an extra spatula or two, and a large pair of scissors will complete a good working outfit. For making moulded fondants it is a good plan to invest in a rubber fondant mat. Small rings can also be obtained for peppermint creams, and a dropper made of tin. The latter is shaped like a funnel with a band of copper round the nozzle end, and a stick to fit it, which is lifted for a fondant mixture to drop out in the quantity required to form each sweet. The stick is replaced and the dropper quickly moved to fill the next mould or ring.

Sugar Boiling. Only the best-grade sugar, granulated or loaf, should be used. If inferior sugar is employed, there will be much scum during boiling, and a tendency for the batch to grain, i.e., to come back to its original state of crystallization. Any scum must be removed. Good sugar should show next to no scum, and should boil clear and sparkling.

In boiling sugar strict cleanliness is essential. The pan should be well scoured, and all utensils carefully washed. Place sugar in the pan at the rate of 4 lb. to every pint of water. This will be found thick enough in consistency for most sweets, but a rather larger proportion of sugar is allowed for fount mixtures by some sweet makers who use 4 lb. sugar to $\frac{1}{2}$ pint of water.

Wash down the sides of the pan with a small brush to remove all adhering sugar, and set the pan and its contents over gentle heat, so that the sugar will melt slowly and completely. Now bring it quickly to boiling point, remove it from the heat, carefully stir in cream of tartar or glucose, as in the recipe, wash down the sides a second time, and place the pan once more, with the lid on, over a good heat. The lid should be kept on for about 10 min., so that the steam may thoroughly wash down any adhering crystals. Remove the lid, and insert the thermometer gently. Too much importance cannot be attached to the necessity of removing any scum during the boiling process, but there must be no movement of the pan after boiling point has been reached. The more rapid the boiling after the sugar has dissolved the better will be the quality of the sweets.

Before inserting the thermometer, it should be warmed in hot water and not put directly into the boiling syrup, then leave the thermometer undisturbed in the syrup until the temperature reaches 240 deg., if the sugar is required for fondants or similar sweets. A slightly higher degree is necessary for tablets. At 310 deg. if a little sugar is withdrawn and dipped into cold water it turns quite hard, and cracks between the teeth with a snap without sticking. This is the highest degree advisable to attempt. It is known as the crack, the degree for all hard sweets and rocks.

When the sugar has reached the desired degree, take the pan carefully off the fire. The thermometer should be removed and gently

other things being equal, they determine the quality and attractiveness of the sweets. Both colour and flavour should be very delicate for creams and bonbons. It gives them an unprofessional appearance to be over coloured, and too much flavour is out of character. Essences and essential oils are the chief flavouring ingredients. The former are not satisfactory unless highly concentrated, so that those specially prepared for sweet making must be used.

Essential oils are most suitable for high-boiled candies, but there are many inferior makes on the market, and only the more expensive brands should be used. Cheap essential oils are very impure, require a larger quantity than the better grades to flavour the sugar, and leave a harsh, unpleasant taste in the mouth. Special colours in all shades are prepared and, like the flavours, can be purchased from any bakers' sundriesmen, or in a good grocery department.

Sweets with a Fondant Basis. In a large class of sweets the basis is fondant. Take 2 lb. best granulated sugar, put it in a clean aluminium saucepan and add $\frac{1}{2}$ pint cold water. Proceed as directed for sugar boiling, adding 1 dessert-spoonful warm liquid glucose to the boiling syrup, stirring it well, and replace over the heat. Do not allow flames to come up the side of the pan, but keep the heat well below. When the syrup has reached a temperature of 240 deg., remove the pan from the heat, take out the thermometer, and allow the syrup to settle, and then gently pour it in a thin sheet on to the marble slab, previously wetted with cold water. Sprinkle the fondant with a little cold water and allow it to cool slightly. In hot weather this takes several minutes; in cold, the mass will require creaming almost at once.

Scrape it into the middle with the scraper and then take a wooden spatula and work the sugar backwards and forwards. Hold the scraper in the left hand and the spatula in the right so that as the spatula works the scraper collects the spreading mixture. The syrup will gradually turn into a thick cream and then suddenly to a solid white mass. Experience is needed to get the exactly correct temperature at which to start creaming the syrup. If worked too hot it will cream easily, but the resultant fondant will be coarse. If too cold, or with excess of glucose added to the syrup, it will be difficult to cream.

When required for immediate use, the fondant should be further kneaded on the slab with the hands until quite free from lumps and a smooth, creamy mass. Fondant made in this way will keep for weeks if placed in an airtight jar and stood in a cool larder. The fondant should be left on the slab for 15 min. covered with a clean cloth before being put into the jar. It is really better when allowed to mellow for a day or two before being moulded or used as a basis for other sweets.

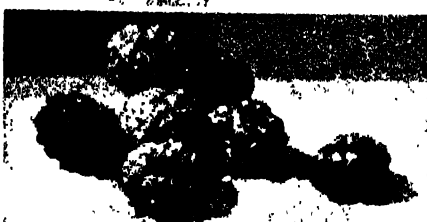
Where fondant has been stored it sometimes requires to be thinned down with boiled sugar syrup, and it is well to have some in stock if sweets are to be made often. To 2 lb. granulated sugar in a saucepan, add 1 pint cold water, $\frac{1}{2}$ teaspoonful cream of tartar and 1 dessert-spoonful glucose. Boil as directed before but remove from the fire when the syrup reaches 220 deg. Pour it into an airtight jar and store for use.

Coconut Ice. For this sweet (Fig. 1), take 1 lb. fondant mixture and put it into a saucepan. Stand this in a larger pan of hot water and stir the fondant with a wooden



placed in a jug of hot water. The syrup is left to become perfectly still and the air bubbles must cease before proceeding with the sweet making.

Flavouring and Colouring. Next after sugar in importance come flavour and colour. These must be carefully chosen, for,



sweets. Fig. 1. Coconut ice, made with a fondant mixture and desiccated coconut. Fig. 2. Coconut kisses, in which the mixture is rolled into balls.

spatula. A few drops of the thinning syrup may be added, but care must be taken not to get the fondant too thin. Continue stirring until it is the consistency of thick cream, divide it into two equal portions, and colour one pink by adding a few drops of cochineal and kneading well in. Work into both portions on the slab enough desiccated coconut to make them fairly stiff. Avoid excess of coconut. Press out each piece to $\frac{3}{4}$ in. thickness, and place pink over white. Place a weight on top and allow the cream to sit till firm, then cut it up into bars. For variety, lemon colour and flavour might be used instead of the pink. To make coconut kisses (Fig. 2) the mixture is rolled into little balls and left to cool.

Peppermint Creams. Care must be taken in melting the fondant for peppermint and other creams with this basis. It should be made just so hot that the finger cannot be kept in it for more than a second or two. If under-heated, the sweets will not set properly; overheated, they will turn quite hard. When adding thinning syrup be guided by the condition of the fondant. In hot weather it will be more creamy and easier to stir while being reheated; in winter a few extra drops of syrup will be required. Add flavouring (colouring also when necessary) when the fondant is warmed through and the syrup has been thoroughly stirred into the mass with a wooden spatula. For peppermint creams add a few drops essential oil of peppermint to $\frac{1}{4}$ lb. warm fondant mixture. This will be sufficient to fill 24 peppermint cream rings. Quickly pour the fondant into a warmed dropper, and fill the rings one third full. When cold turn each ring upside down and gently tap it and the cream will drop out.

Bonbons and Creams. The basis of a number of fancy bonbons is almond cream, which can be made thus: To 1 lb. warmed fondant flavoured with vanilla add 4 oz. ground almonds, working the latter in thoroughly. Variations are produced from this basis by adding chopped fruits, figs, dates, glace cherries, or nuts, Baci-lona, pistachio, etc.

Neapolitan creams are made by taking four equal portions of almond cream and colouring one pink with cochineal, another with saffron,



Sweet. Fig. 3. Walnut creams, consisting of balls of almond cream surmounted by half walnuts.

another with pale green or coffee colour, and leaving the fourth white. On to a piece of waxed paper on a board press out a piece of the pink fondant to a square $\frac{1}{2}$ in. thick, and then proceed to place a square of the same size and thickness of each of the other coloured fondants on the top. Gently press them together. Take a sharp knife and cut the mass into strips. Use a sawing movement while cutting. The strips should be further cut into cubes. Almond cream may be used to stuff French plums or dates. The stone is removed, a roll of the cream neatly inserted, and the fruit pressed together. The almond cream may also be shaped into balls and half a shelled walnut placed on top, as illustrated in Fig. 3. Bonbons (Fig. 4) are made by dipping almond cream centres in fondant, using a dipping fork. The tops may be decorated with lines, swirls, etc., or with split pistachios, angelica, or coloured sugar. The article on Chocolate may be consulted for further ideas on suitable centres for bonbons.

Moulded Fondants. To make pretty shaped fondants a rubber fondant mat is a good investment. The mats are obtainable in several sizes. They must be used quite dry. The slightest damp or remains of former fondant will prevent the new batch of sweets from turning out properly. When the fondant has been reheated, thoroughly stirred, flavoured and coloured, as already described, pour it gently but quickly into the warmed dropper and fill each impression or mould just level in the fondant mat. When cold the sweets come out easily if the mat is very slightly bent upwards. Should a sweet stick, remove it with a tiny spatula, but do not use that impression in the mat again if rebelling the mat for the rest of the batch. The mat should be quite clean and dry to refill several times without washing if the fondant is of the right consistency and each sweet has come out of its impression cleanly. After use the mat should be washed in warm water with a small brush, rinsed in several clean waters and dried on a rack over a low fire before putting away. By means of the ends of two teaspoons fondants can be shaped. Take small portions of the hot fondant and drop them on the slab, quickly pressing the portions into shapes.

Tablets. Tablets may be made as follows. Boil 2 lb. sugar with $\frac{1}{2}$ pint water to 245°, stirring in a pinch of cream of tartar just when it reaches the boiling point. Allow it to settle for a minute or two after removal from the heat, add flavour and colour, and, with a metal spatula, vigorously rub small portions of the syrup against the sides of the pan, and stir these in till the whole becomes cloudy. This is called graining. Add desiccated coconut, almonds, walnuts, etc., as desired, then quickly pour into frames, previously lined with waxed paper. An unlimited variety of tablets may be produced in this way (Fig. 5). Colours and flavours should harmonize.

For ginger tablet add finely chopped ginger, flavour with gingerine and colour a light brown with kitchen brownings (burnt sugar). For raspberry tablet flavour with raspberry essence and colour with carmine. For chocolate tablet flavour with vanilla, colour with melted chocolate or with chocolate powder well stirred in. Chocolate macaroons are easily made. Cut up plain white coconut tablet into bars, dip these into melted chocolate, well thinned down with coco butter, and roll the bar in fine desiccated coconut.

Mexican Kisses. The candy known as Mexican kisses is made from 3 breakfast-cupfuls best Demerara sugar, 1 cupful milk, 1 lb. chopped walnuts, a piece of butter or margarine about the size of an egg, and 1 teaspoonful vanilla essence. Boil the milk and sugar together, then add the butter, and continue boiling until the mixture hardens slightly when tested in cold water. Beat the whole well for 3 min., add the walnuts and vanilla, and beat again before turning it into a buttered tin. Mark it into squares before it cools.

Sweetmeat Jellies. The sweets that are known as jellies can be made at home and without the aid of special confectioner's tools if a plain cube shape is not objected to. Two recipes are given, one for making them with gelatine and one in which agar agar or Japanese gelatine is used. This can be purchased at any of the large stores or at a chemist's.



Fig. 4. Bonbons, for which various centres are dipped in fondant and the tops decorated with coloured sugar, etc.

To make the jellies with plain gelatine take $\frac{1}{2}$ lb. any stoneless jam, 1 gill water, $\frac{1}{2}$ lb. loaf sugar, and 3 $\frac{1}{2}$ oz. best leaf gelatine. Boil the jam with the sugar and water for a few minutes, then strain through a hair sieve. Return the mixture to the saucepan and add the gelatine, which should have been previously dissolved in 2 tablespoonfuls warm water. Boil up and skim, and if desired add colouring or extra flavouring. Pour the mixture into bright, shallow tins lined with waxed paper and leave them all night. In the morning reverse the tins to release the jelly, and remove the paper by wetting it. Cut the jellies into small pieces. They look more attractive if rolled in granulated sugar.

To make jellies with the variety of gelatine known as agar agar soak $\frac{1}{2}$ oz. overnight, using 2 pints cold water. In the morning dissolve it over the fire by gentle heat and keep it warm while the syrup is being made. Put the sugar into a strong unlined pan with 1 pint cold water, let it melt, and then boil it till, on a little being dropped into cold water, it will break in a brittle manner, but it must not be coloured. Remove the pan from the heat, and pour the gelatine into the sugar. Mix it well.

The jelly can now be flavoured and coloured as desired, or it can be divided and the flavour and the colouring can be varied. Proceed as

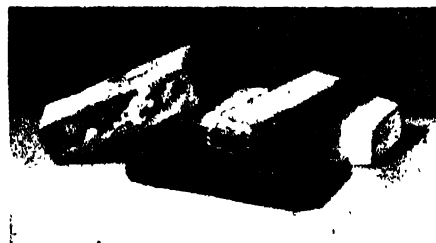


Fig. 5. Tablets, made from a boiled sugar syrup, variously flavoured and coloured, and desiccated nuts.

in the former recipe to mould. A large pinch of cream of tartar should be added to the sugar when at boiling-point.

Pulled Sugar. Sugar boiled beyond 250 deg. and allowed to cool turns into a hard crystalline mass. The addition of some acid substance, as cream of tartar, or of some non-crystallizable substance, like glucose, causes it to be very pliable while hot, and quite transparent when cold. The pliability of hot sugar is a very important point in the making of rocks, and the transparency is essential to appetizing boiled sweets.

In pulling sugar for rock making, a large metal hook, about 6 in. across, is used. It is fixed on a wall, level with the chin. The marble slab must be well greased with butter. The hook and a metal scraper or knife used to work the sugar should also be thoroughly greased. With the scraper gently fold over the edges of the mass, raise it a little at a time, and continue folding over towards the centre until the sugar mass is sausage shaped and just cool enough to be held in the fingers. Before doing this, grease the hands or the sugar will stick. Keep the sugar as much as possible on the fingers and not on the palms of the hands. Fling it on the hook so that the sugar mass is suspended in the middle and drawn by its two ends towards the operator.

When pulled out several feet, the ends are placed together and held by the right hand, while the left is moved till only a foot or two below the hook and laid over the sugar. The left hand is then drawn downward so that the sugar forms an S, and almost simultaneously both are thrown towards the hook, so that the sugar is doubled over on itself. This is repeated over and over again until the requisite amount of pulling has been accomplished. The sugar will probably take about 15 min. to pull. During this process air is enfolded in the hot

sugar, which increases in volume and very perceptibly changes in colour, colourless sugar becoming snow white, red changing to pink, and black brown to cinnamon.

Rock Making. The beginner must remember that in all rock making quick handling of the sugar is essential. If it cools too much and is difficult to work, heat it over a gas-flame. To make Edinburgh rock, take 2 lb. granulated sugar, $\frac{1}{2}$ pint water, and a good pinch of cream of tartar. Boil to 260 deg. and pour sugar on to the oiled slab. As it sets round the sides, turn these right over into the centre with the greased scraper or a palette knife, so that it will all cool evenly. Add colour and flavour, fold the sugar over on itself once or twice, and pull it on the hook as already explained. When removed from the hook place it on a board well dusted with icing sugar, roll it into sausage shape, then pull it out to the thickness required and cut the strip into suitable lengths, and let them lie for a day or two to granulate.

Peppermint Rock. Plain peppermint rock may be made with $3\frac{1}{2}$ lb. white sugar, $\frac{1}{2}$ lb. glucose, 1 pint water, a few drops of oil of peppermint. Boil to 310 deg., the crack degree. Pour sugar on the oiled slab and turn in the edges as it cools. Sprinkle over it 2 or 3 drops of peppermint. When fairly firm, but still very hot, pull the sugar over the hook till it has a white satin like appearance. Knead it up a little on the slab, make it into a thick sausage, then set it on end and pull it out into rope-like strands. Keep rolling these till they firm up, or cut them with a pair of scissors into short lengths.

For striped peppermint rock (Fig 6), boil up the sugar as before. Have a little red colour powder made up with water into a thick paste,



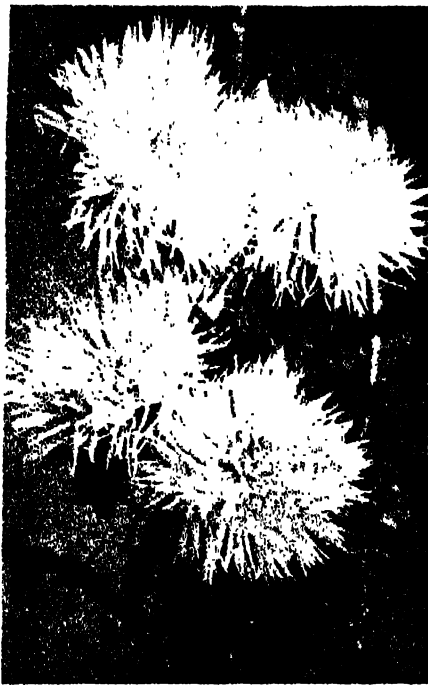
Sweets. Fig. 6. Striped peppermint rock, a favourite and wholesome sweetmeat for children

and well stir a little of this into a corner of the hot sugar on the slab. While turning in the edges take care that the coloured portion is kept apart. The other portion, which should be the bulk of the sugar, is pulled as before, and rolled into sausage shape. The coloured sugar is well kneaded, then drawn out into long ropes, which are laid along the white in twos or threes, at wide intervals apart. The sugar is then made into a cone, and the narrow end drawn out as before into a thin rope. The result is a peppermint rock with very thin stripes of red, the artistic effect depending almost entirely on the good taste of the maker.

Cough rock is made from the same recipe as that for peppermint rock, but with oil of aniseed as the flavouring. Here about one-quarter of the whole is pulled on the hook, the rest being coloured black and strongly flavoured with aniseed. This latter is rolled into sausage shape, while the white is flattened out and made to enclose the black completely. A cone is formed as before, and drawn out, giving a rock with black centre and thin white case.

Some candy makers do not use a hook, but simply take the two ends of the sugar (when cool enough to handle on the greased slab), pull the strip evenly, then putting the end in the right hand into the left, fold the roll over and pull. Continue in this way until the sugar is firm enough to cut up.

Boiled Sweets. The various rocks, while still pliable, may be cut with scissors into



Sweet Sultan, a hardy annual with fragrant flowers in white, rose, purple or yellow

lengths of about $\frac{1}{2}$ in., and rolled between the palms of the hands to form balls, striped or plain. These balls are known as boiled sweets.

Acid balls are made by boiling 3 lb. white sugar, with $\frac{1}{2}$ lb. glucose and 1 pint water, to 310 deg. Pour the sugar on oiled slab, turn in the edges as it cools, and add a good pinch of tartaric acid and a few drops of oil of lemon. Knead it well. Draw it out as for rock, cut it with scissors, and roll it into balls. Ingredients for making cinnamon balls are the same as for peppermint rock, but the flavouring is cinnamon. Pull the sugar on the hook till it is of the proper colour. Draw it out, cut it with scissors, and roll it into balls. To make cushions, cut the strip across and give it a half-right turn, which brings the point of a cushion up. Clip it off and then give the strip a quick half-turn left and cut off. Each time the half turn is reversed so that the strip is not twisted. Any pulled sugar sweets may be thus formed into cushions and wrapped in waxed papers to make them look quite professional.

Crystallizing Sweets. Even high-boiled sweets rapidly deteriorate when kept in contact with the atmosphere. It is customary to crystallize many of the finer varieties, so that they may be immune from atmospheric influence. Sweets treated in this way are greatly improved in appearance.

The sweets to be crystallized are set on little wire stands, similar to those used in baking, but on a smaller scale, and these are placed in shallow tins. A deep tin is often used, and the trays, with their rows of sweets, are set one upon another inside it. These trays should have legs about $\frac{1}{2}$ in. long. The sweets on top are covered with another flat wire tray, to keep them from floating in the syrup. The trays thus arranged, the crystallizing syrup (see recipe at top of next column) is gently poured in, and the whole allowed to remain untouched for 8 hours, by which time a coating of crystals will have formed. If the coating is not heavy enough, a little longer immersion will be effective.

When removed from the syrup, the sweets are set out on wire trays in a warm, dry room to dry thoroughly. Sweets crystallized in this way will keep for many weeks, even

when exposed to the air. The spent syrup can be boiled up again for tablets or rocks.

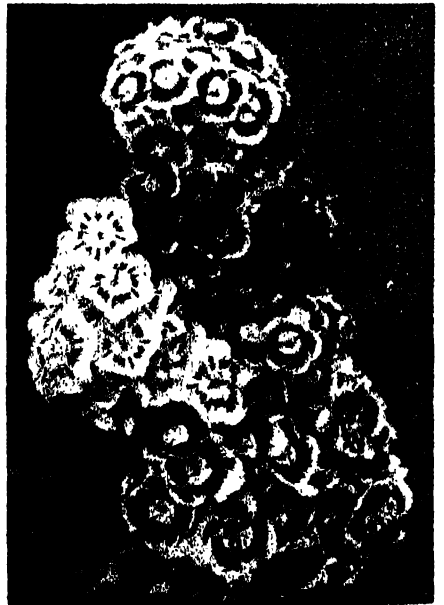
The recipe for crystallizing syrup is as follows: Boil 4 lb. sugar with $1\frac{1}{2}$ pints water, using no cream of tartar or glucose, to 218 deg. Cut out of soft brown paper a piece to fit exactly the top surface of the syrup, leaving a small hole in the centre of it. The syrup should be set aside to cool, and disturbed as little as possible.

SWEET SCABIOUS. This hardy and useful garden plant is also known as the pin-cushion flower, the species including perennial and annual kinds. The former includes the very beautiful Caucasian scabious. See Pin-cushion Flower; Scabious.

SWEET SPIRIT OF NITRE. Spirit of nitrous ether, popularly called sweet spirit of nitre, is commonly prescribed in slight feverish attacks, colds, etc., on account of its diaphoretic action on the skin. It thus tends slightly to reduce the temperature. The drug also has a marked diuretic effect on the kidneys, and is therefore often an ingredient in mixtures prescribed in kidney, heart, and lung troubles, where it is desired to increase the flow of urine.

SWEET SULTAN. This is a beautiful hardy annual (*Centaurea moschata*) with fragrant flowers in white, rose, purple, yellow. The modern named varieties have large handsome blooms, and the plants are from 18 to 24 in. high. Seeds may be sown out of doors in spring or in September. Sweet Sultans need well dug friable soil and a sunny situation.

SWEET WILLIAM. This is a charming old-fashioned garden flower (*Dianthus barbatus*) of which splendid new varieties have been raised. Two of the most striking are Scarlet Beauty and Pink Beauty. The auricula-eyed varieties of mixed colouring are also attractive. These plants are grown as biennials, seeds being sown in boxes of soil in May: the seedlings are planted on a



Sweet William. Four varieties of this richly coloured flower, familiar in cottage gardens

reserve border for the summer, and in October are set out where they are to bloom the following year. They should be destroyed after flowering, and a fresh stock of plants raised from seeds. Sweet Williams can also be grown from cuttings in summer.

SWELLING. In inflammation swelling is accompanied by redness, heat, and pain. A dropsical swelling of the skin has the peculiarity

that firm pressure with the point of the finger leaves a depression or pit which takes some time to fill up. Tumours form fairly well-defined swellings as a rule, at any rate at the beginning. A swelling in the groin or elsewhere on the abdominal wall may be due to a rupture or hernia.

The nature of a swelling should be determined before treatment is undertaken as poultices or rubbing, which have their uses in appropriate cases, in others may do damage. See Abscess; Sprain.

SWIFT MOTH. Being a nocturnal moth that flies after dusk, the swift moth is seldom seen, except by the entomologist, generally during the month of June. Its grubs, however, are more familiar, and may be recognized by their brown heads and bristly creamy-white bodies, about $1\frac{1}{2}$ in. long. These are some-



Swift Moth. Natural size

times found devouring roots of potatoes, beans, asparagus, dahlias, peonies and other crops. A good remedy is effected by the digging in of naphthalene and lime during the autumn or winter months.

SWINE FEVER. This disease is often very destructive to pigs. It is also very contagious and is therefore one of the diseases that are notifiable. This means that in case of an outbreak the officials of the Ministry of Agriculture must be informed at once. They will then tell the owner what he must do to combat the disease.

SWINGS FOR NURSERY AND PLAYGROUND

How to Construct an Outdoor Type

This is one of the entries in this work that deal with the recreations of children. See also Nursery. The builder of a swing will find other valuable information in the articles that describe the various tools and woodworking processes.

Swings that are in the form of a chair to which ropes are attached are sold for indoor use. These can be fastened to the top of a door, so that the child can swing through the opening. This arrangement is suitable only for a small child. The hooks by which it is suspended from the door lintel should be securely fixed. A lighter type which can be bought has netted sides, the chair being enclosed except at the front, making it safe and comfortable even for an infant. Fig. 1 illustrates a type of swing such as

may be erected in a garden or courtyard. Fig. 2 shows a front elevation of the framework, a side view being given in Fig. 3. The parts are marked with a distinguishing letter, those marked with the same letter being similar in size and shape.

Any kind of sound timber which is neither liable to split nor warp may be used. Well-seasoned pine, larch, ash, or elm planks are all suitable, obtained (if possible) planed and trimmed to size. The quantities and sizes of timber required are given in the following

list, each piece being named and lettered for reference.

		Long ft. in.	Wide in.	Thick in.
2 uprights	A	11 0	6	2
1 cross-beam	B	5 0	6	2
1 spar	C	5 6	4	1
1 stay	D	4 4	4	2
2 cross-braces	E	6 6	4	2
4 ground plink	F	1 6	6	—
1 seat-board	G	1 11	12	1

The following iron fittings are required.

		Long in.	Diameter in.
2 nutted eye-bolt of galvanized iron	H	6	1
4 round-headed nutted bolt	K	7	—
6 round-headed nutted bolt	L	7	—
4 screw bolts	M	6	—
8 round-headed nutted bolts	R	2 1	—

Four lengths of flat bar iron 8 in. long $1\frac{1}{2}$ in. wide, and $\frac{3}{8}$ in. thick are required for the seat-irons P. Two lengths of flat strip iron $10\frac{1}{2}$ in. long, $1\frac{1}{2}$ wide, and $\frac{3}{8}$ in. thick are needed for the plates Q. The two chains S are each 6 ft. 6 in. long; the links are of $\frac{1}{2}$ in. galvanized iron and about 1 in. by $\frac{1}{2}$ in. inside size. Four shackles T are each of $\frac{1}{2}$ in. galvanized iron, inside size $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. Fourteen washers with $\frac{1}{2}$ in. diameter holes are also required.

Uprights A A are prepared first, two $\frac{1}{2}$ in. diameter holes being bored through the breadth of the upper end of each upright from the centres given in Fig. 4. A $\frac{1}{2}$ in. diameter hole is bored through the thickness of the lower end of each upright, from the point shown in Fig. 3. A mortise 6 in. by 2 in. by 2 in. is cut in each upper end. Fig. 4 showing how they are marked out. The upper ends of both uprights are cut to the shape detailed in Fig. 5. Checks for the upper ends of the stays D D are cut in the thickness of each upright, Fig. 6.

Eye-bolts H H are fitted to the cross-beam B by boring a $\frac{1}{2}$ in. diameter hole through the breadth of the beam from each of the centre points in Fig. 7. A recess of the size of the nut on each eye-bolt is cut in the upper side of the cross-beam at each $\frac{1}{2}$ in. hole. An eye-bolt nut is placed in each recess as shown and wedged tight, then the eye-bolts are fitted securely.

Two $\frac{1}{2}$ in. diameter holes are bored through the cross-beam at its right and left sides, as in Fig. 7. The spar C is

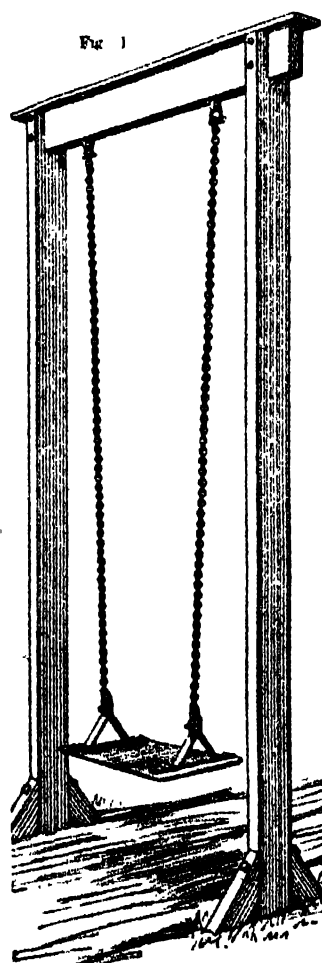


Fig. 1

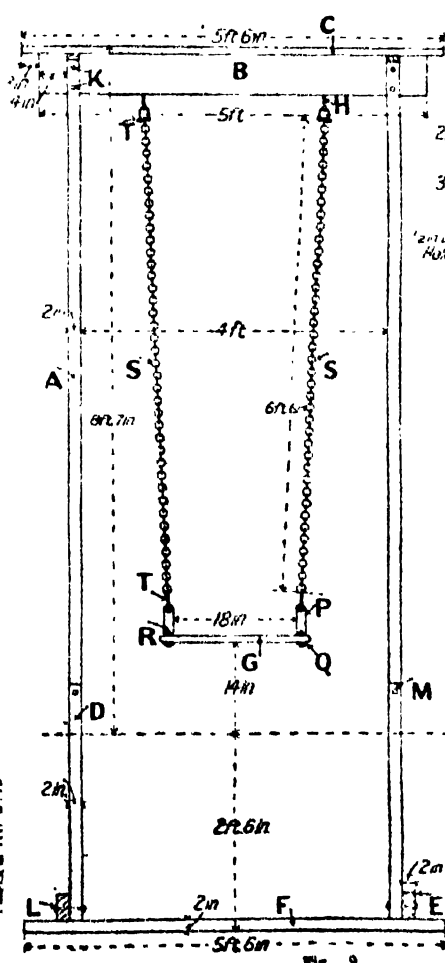


Fig. 2

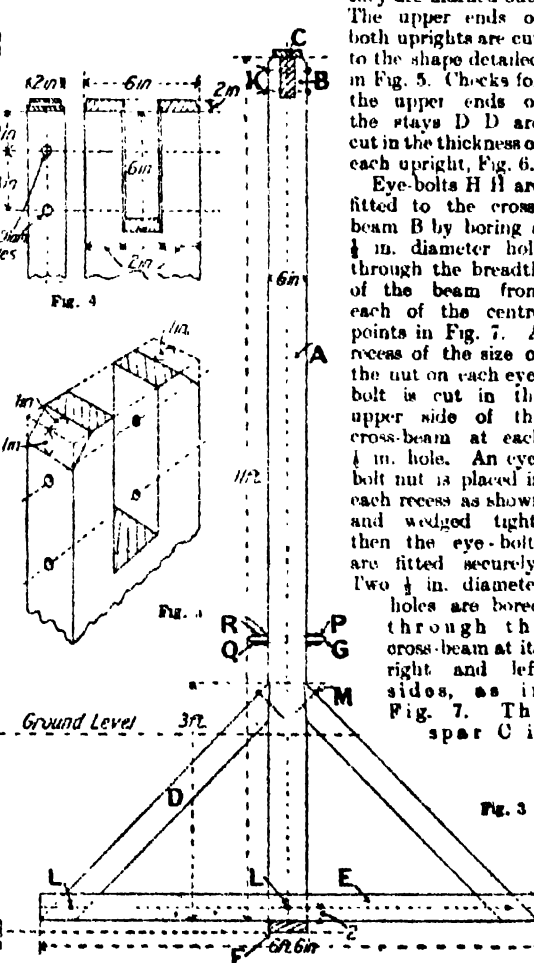


Fig. 3

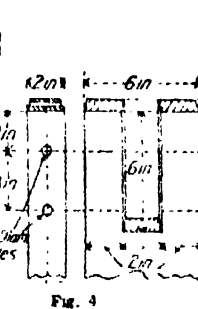


Fig. 4

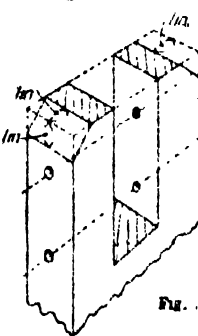


Fig. 5

Swing. Fig. 1. Swing that may be erected out of doors. Fig. 2. Front elevation of framework. Fig. 3. Side elevation. Parts marked with the same distinguishing letter are of similar size and shape. Fig. 4. Front and side views of top of upright, showing position of slots and holes. Fig. 5. Details of shape of upright top

nailed to the upper side of the cross-beam, as in Fig. 2. The spar is shown in Fig. 9.

Stays D D D D are cut as in Fig. 8, a $\frac{1}{2}$ in. diameter hole being bored through the thickness of each stay. The tie-beams E E have three $\frac{1}{2}$ in. diameter holes bored through them as in Fig. 9. The corners and edges of the seat-board G are rounded as shown in Fig. 10, the positions of the seat-irons being marked out. The bars for the seat-irons P P P P are bent to shape, as in Fig. 12. The centres for three $\frac{1}{2}$ in. bolt holes are marked with a centre punch on each bar, at the point given in diagram A, then the lines from which the bars are bent to shape are marked off from the measurements in B. These lines should be slightly incised with a cold chisel, so that they may show clearly when the irons are heated.

After the bends have been marked, the corners of the bars are cut off with the chisel and the ends filed to the semicircular shape in C. The bars must be heated before they can be bent to shape. Some trouble can be saved if the irons are taken to the local blacksmith to be bent. If the worker prefers to do the

work himself he can proceed as set out in the article on Forging.

Three $\frac{1}{2}$ in. diameter holes are drilled through each seat-iron from the points previously marked with a centre punch. The irons are then placed in position on the seat and tested. The plates Q Q, which are fixed beneath the seat-board, are prepared as shown in Fig. 13. Four $\frac{1}{2}$ in. diameter holes are drilled through each plate from the points given in the diagram, then both ends of each plate are rounded in the same manner as those of the seat-irons. Both pairs of seat-irons are now placed exactly in their positions, as in Fig. 14. The positions for the holes for the bolts R are marked on the seat, then the irons are removed, and a $\frac{1}{2}$ in. diameter hole bored through the seat from each point.

After the irons are replaced, the small bolts R are fitted into the holes in the lower angles of the irons and partly into those in the seat, then the 2 plates Q Q are placed in position on the underside of the seat, and the holes brought in line with the bolts. The bolts are driven in until their ends project through the holes in the plates, a nut being fitted to each

projecting bolt and tightly screwed up with a spanner.

The woodwork of the swing is assembled by first fitting and bolting the tie-beams and stays to the uprights, then bolting the cross-beam in position and finally attaching the ground plank F (Fig. 11) to the lower ends of the uprights. Lay the two uprights A A on the ground and place a tie-beam E across each of their lower ends. Bring the hole in the centre of each tie-beam in line with the hole at the lower end of each upright. Next insert a $\frac{1}{2}$ in. bolt L (Figs. 2 and 3) into the hole in each tie-beam, and pass it through that in each upright. A washer is placed on the projecting end of each bolt, and a nut fitted and tightened up.

The stays D D D D are fitted to the tie-beams and uprights in the following order. A stay is bolted to the right end of each tie-beam, then the upper end of each stay is placed in the check in the right side of each upright. The upper end of each left stay is fitted into the check in the left side of each upright, and the lower ends of the stays are bolted to the left ends of the tie-beams. The $\frac{1}{2}$ in. bolts should be fitted with washers, and the nuts screwed firmly home. The upper ends of the stays are secured in the checks by means of the 6 in. screw bolts M.

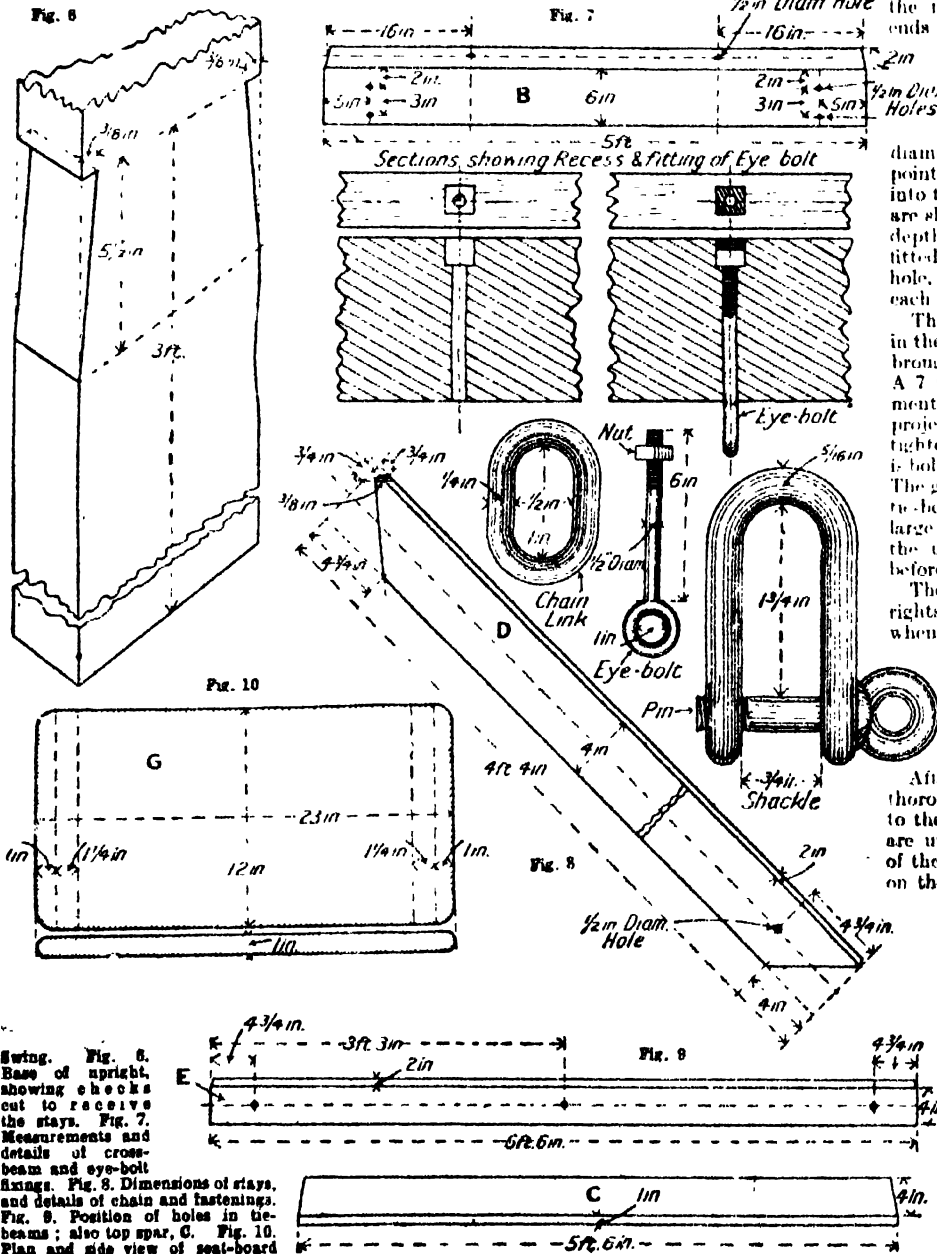
Each screw bolt is fitted as follows. The centre of the thickness of each stay is found and marked, at a point 2 in. from the upright. A $\frac{1}{2}$ in. diameter hole is then bored from each centre point at right angles through the stay, and into the upright to a depth of 4 in. The holes are slightly enlarged with a $\frac{1}{2}$ in. rose-bit for a depth of about $1\frac{1}{4}$ in. Each screw bolt is fitted with a washer and inserted into the hole, and screwed in with a spanner until each stay is firmly bolted in position.

The cross-beam B is placed in the mortises in the uprights, and the 2 holes at its right side brought in line with those in the right upright. A $\frac{1}{2}$ in. bolt K is driven through each alignment of holes, then a washer is placed on the projecting end of each bolt, and a nut fitted and tightened up. The left end of the cross-beam is bolted to the left upright in the same manner. The ground plank F (Fig. 11) is attached to the tie-beams and lower ends of the uprights by large nails. Care must be taken to see that the uprights are the correct distance apart before the ground plank is fitted.

The cross-beam and those parts of the uprights and stays which will be above ground when the framework is erected are given several coats of varnish paint. The seat may be given a varnish finish or painted. Grease oil or hot tar is applied to the lower portions of the uprights and stays and to the tie-beams and ground plank.

After the framing and seat have become thoroughly dry, the chains S S are attached to the eye-bolts in the cross-beam. The pins are unscrewed and partly withdrawn from 2 of the shackles T, then the shackles are placed on the eye-bolts. The upper end link of the right chain is placed on the pin in the right shackle, and the pin screwed home. The left chain is fitted to the left shackle in the same manner. Details of the chain, eye-bolts and shackles are given in Fig. 8. These should be of the dimensions specified.

The ground where the swing is to be situated is dug out to a depth of 2 ft. 6 in., Fig. 15 showing the measurements and shape of the excavation. After the earth has been removed, the bottoms of the trunks should be well rammed. The framework is then lowered into the excavation and uprighted. If the uprights are not perpendicular, the

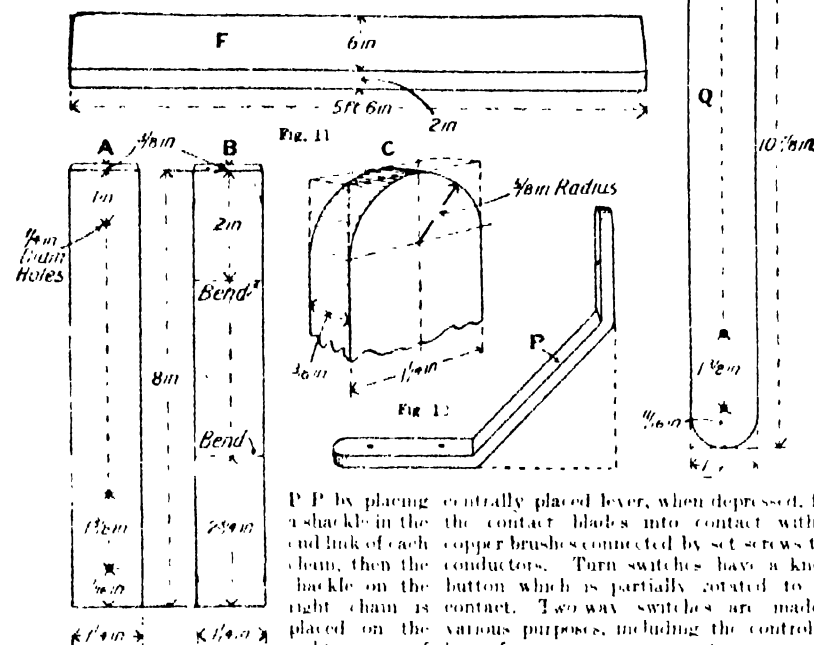


Swing. Fig. 6. Base of upright, showing checks cut to receive the stays. Fig. 7. Measurements and details of cross-beam and eye-bolt fittings. Fig. 8. Dimensions of stays, and details of chain and fastenings. Fig. 9. Position of holes in tie-beams; also top spar, G. Fig. 10. Plan and side view of seat-board

ground beneath the tie-beams and ground plank must be removed until they become so.

The framework has to be tested with a plumb line and the spirit level, and any errors of position rectified. When all is correct, a layer of earth about 1 ft. deep is shovelled into each trench and rammed down. Large stones or old bricks should be arranged round both uprights and firmly driven into the soil. The chains are attached to the seat-arms

SWITCH : For Electric Light. The



Swing. Fig. 11 Ground plank Fig. 12 Diagrams showing how the bars for the seat-irons are bent to shape. Fig. 13. Plates for securing seat-irons. Fig. 14. Method of securing seat-board. Fig. 15. Shape and dimensions of excavation into which the framework is to be lowered

the pin fitted through the shackle and hole in the frame and firmly screwed up. The shackle on the left chain is then fitted to the left part of seat-iron and the pin tightened up, and the swing is complete.

The seat will be about 14 in. from the ground, that height being convenient for general use. It can be raised, if necessary, by moving the shackles to higher links on the chains. One-inch diameter ropes can be substituted for the chains, but they cannot be compared with the latter for strength or durability.

SWISS CREAM. This sweet is made by heating up 2 breakfast-cupfuls of fresh milk with the thinly peeled rind of a lemon, placing the pan at the side of the stove so that the process may be slow enough to let the milk absorb the flavour of the peel. Add $\frac{1}{2}$ oz. sugar, 1 gill cream, boil up the whole, strain, and leave to cool at the side of the stove. Stir in the well-beaten yolks of 3 eggs, and sugar to taste, put the pan back on the heat, and continue stirring until its contents thicken. Then let the mixture cool again, and add to it a few blanched and split almonds and some small pieces of preserved ginger before turning it into a mould to set.

Swiss Roll. See Chocolate Roll; Jam Roll.

SWISS TART. These small sugar-covered tarts can be made from 6 oz. flour, $\frac{1}{2}$ lb. margarine, 2 oz. castor sugar, water to mix, and a little jam. Sieve the flour into a basin, rub in the margarine, then add the sugar, mixing well. Add a tablespoonful of water, mix it in, then divide the mixture into six equal portions, forming each into a ball.

Grease 6 small cake tins, put a ball into each, and in the centre of each ball press the little finger, making a hole almost to the bottom. Drop a little jam into the hole, and decorate the top with a knife. Bake in a moderately hot oven for 20 min., then leave to cool on a sieve, and, before serving, sprinkle the top with icing sugar.

centrally placed lever, when depressed, forces the contact blades into contact with the copper brushes connected by set screws to the conductors. Turn switches have a knob or button which is partially rotated to effect contact. Two way switches are made for various purposes, including the control of a lamp from one or more points.

A lamp-holder and switch combined, for a lamp near a writing-table or bed, is available with a key or handle to operate the switch or a press knob device. Similar switches in a pear shaped knob are used to control a lamp fixed over a bed. Another variety is combined with a ceiling rose, and is actuated by a chain or cord. This is a better arrangement, since the live wires stop at the ceiling rose and do not hang down over the bedstead.

The larger switches used to connect and disconnect the whole house supply are generally of the knife switch type, consisting of a lever handle and one or more solid copper contact blades. Such switches are made single pole or double pole. The former disconnects one element of a circuit only, as, for example the \pm or flow wire. A double-pole switch disconnects both the \pm and $-$ wires simultaneously. For heavy duty and greater protection, many switches are mounted in a cast-iron casing with an exterior handle. See *Earth*; Electricity.

Sword Grass. This is another name for Ribbon Grass (*q.v.*).

SYCAMORE. This is a valuable timber tree (*Acer pseudo-platanus*) much used for planting in parks and streets. It attains a height of 50 ft. or more, and has large lobed leaves. Propagation is by seeds sown out of doors in autumn.

The timber obtained from the sycamore is close, compact, and easily worked, and it takes a smooth glossy surface from a finely wet plane. If it is properly seasoned and sawn on the quarter it will not shrink or twist to any extent. It is nearly white in colour, with a yellowish tinge. The surface shows a pretty figuring, particularly when the wood is cut nearly parallel to the medullary rays. The wood is used for rollers of mangles and washing machines, dairy utensils, bread boards, and violin backs. Owing to its close grain it is adapted for making wooden bowls, and for the same reason it is suitable for

wood-carving, particularly chip-carving. It takes stain well, and can be used as a substitute for cherry.

SYLLABUB. A very old-fashioned country dish. syllabubs were formerly made with new milk drawn straight from the cow on to the speed and sweetened wine in the syllabub bowl.

For a "farmhouse" syllabub, dissolve in a bowl 3 oz. castor sugar by stirring it with $1\frac{1}{2}$ gills sweet home-made wine and $1\frac{1}{2}$ gills sherry. Add the grated rind of a lemon, and $\frac{1}{4}$ of a grated nutmeg. Put into a large earthenware tureen 1 pint new milk warmed to the degree of freshly drawn milk, and hold the pot high above the contents of the bowl and pour with a circular movement on to the wine. Strew over the top a little grated nutmeg. Let the whole stand for some hours, then cover the top with a dotted cream.

A Staffordshire receipt is to put 1 pint cider with a wineglass of brandy into a bowl, add about 6 oz. pounded lump sugar and 1 teaspoonful grated nutmeg, then stir until the sugar is dissolved. Warm 1 quart new milk, and put it into a jug with a sharp spout, or, better still, an earthenware teapot. Pour it round and round on to the cider, grate more nutmeg on the top, and let it stand for some hours. Serve with whipped cream.

A lemon syllabub has an excellent flavour. Grate the rinds of 2 lemons and stir them into ½ pint sherry or Madeira; also dissolve in the wine 1 lb. lump sugar. Strain the juice of 6 lemons and 1 full-flavoured orange, and add these to 1 pint pure thick cream. Now put both wine and cream into a deep but not very large basin, and beat with a whisk for ½ hour. Let all stand for 2 or 3 days, and the night before it is required for table arrange it in sundae glasses or custard cups.

To make good syllabubs it is most important to use pure fresh cream or milk.

SYNOVITIS. Inflammation of the synovial membrane of the joints, or synovitis, may follow sprains or other injuries.

The acute condition is usually accompanied by pronounced swelling, heat, and pain. It is treated by rest, and cold applications. Later, the joint is massaged, and a woven elastic bandage is put on to maintain pressure and assist in the absorption of the fluid in the joint. In chronic cases iodine or some other

counter-irritant is used to reduce the swelling and a bandage is worn during the day. See Bandage, Joint.

SYPHILIS. Syphilis is due to the entrance of a minute organism beneath the skin or mucous membrane through an injury to the surface, which may be exceedingly small. In the great majority of instances the infection is conveyed by sexual intercourse.

The disease begins with a sore, which develops most frequently upon some part of the organs of generation, usually about 4 weeks after infection. During the next 6 weeks to 6 months there may be fever for a few days, febriculae, and rheumatic pains in the joints. Rashes of various sorts appear on the skin, and the throat and inside of the mouth become ulcerated. In the later stages, tumours known as gummata may appear in any organ of tissue of the body, extensive ulceration of the tissues may take place, the bones may be rooded, the arteries thickened, and aneurism may develop.

Locomotor ataxia and other forms of paralysis may occur, and mental changes such as general paralysis of the insane. In women, miscarriage and abortion are common. A particularly sad form is seen in infants when one or other parent has the disease. Congenital forms of syphilis can be almost eliminated by routine testing of all pregnant women and by adequate prenatal treatment. It is not transmitted beyond the second generation. The provision of early and efficacious treatment is of great importance, and centres are found in all large towns where treatment is given in conditions of strict privacy.

SYPHON : For Mineral Waters. Soda and other mineral waters can be obtained in syphons, which consist of a glass container with a metal top. A glass tube fixed at one end in the top passes down inside the container, extending almost to the bottom. It must not touch the bottom, otherwise the action of the syphon will be obstructed. The top is fitted with a spout or tap, and a small spring lever in the form of a handle which operates a valve. When the lever is pressed down the valve opens and the mineral water in the syphon is forced up through the tube by the pressure of the gas which it contains and discharged through the spout. The quantity is regulated by pulling the handle up by depressing or releasing the handle.

Syphen Stand. This is an ornamental container for the ordinary mineral water syphon. The pattern illustrated is made throughout in silver, and comprises a tubelike body ornamented with a band of piercing in a simple design, and provided with handles.

SYPHON : For Transferring Liquids. A syphon which can be made at home consists of a glass or metal tube bent to a U shape, with the limbs of differing length. It provides a simple means of transferring liquid from one vessel to another. The difference in the lengths of the tube is essential to the action of the syphon, the shorter length being placed in the liquid that is to be drawn off.

If suction is applied to the long leg of the tube the liquid is raised in the syphon and flows out until the level drops below the end of the short leg, or, if the long leg dips into a vessel until the level of liquid in both vessels is the same. As sucking by the mouth may be inconvenient when the syphon is not fitted with a suction pipe, the same effect can be obtained by inverting it and filling it with the liquid. Then, stopping both end with the fingers, or corks, the short tube is placed into the liquid and the ends unstopped, when the liquid will flow steadily until it falls to the level of the lower end.

Syringa. This is the botanical name of the lilac, but it is often wrongly used to describe the mock orange or philadelphus.

SYRINGE : For the Garden. A syringe is invaluable in garden and greenhouse. It should be kept properly packed to prevent leakage; for packing, use tow and grease if available, otherwise substitute darning wool. As a general rule plants with bony leaves or ripening fruit should not be syringed. See Insecticide, Spraying.

SYRINGE : In Medicine. Various kinds of syringe are used in the treatment of different disorders. Directions for syringing the ear are given in the article on Deafness (q.v.). Syringing the nose is often dangerous and should be left to a doctor. See Douches, Ear.

SYRUP : In Cookery. Syrup is a solution of sugar in water heated until, when poured from a spoon, it drops like oil, or by the sugar thermometer to 220° F. It is used for sweetening various foods, as a means of preserving them, and as an article of diet in itself. It can be stored in bottles, and will keep in perfect condition for a considerable period.

The syrup can be merely a simple thick syrup, it can be flavoured, or it can be medicated, but the process is the same. Distilled or filtered water should be used, if there is any doubt as to its purity it should be clarified.

To clarify, have ready a perfectly clean, thick steel or aluminium pan. Dissolve the sugar in the water, placing both together in the pan, and allowing $\frac{1}{2}$ pint water to every lb. of sugar. The water must be accurately measured. Whip up the white of half an egg with 2 or 3 table-spoonsful of water until light, then pour it into the syrup and place the pan over slow heat. Beat until a froth forms, then skim the surface and brush the sides of the pan clear with a clean pastry brush dipped in hot water.

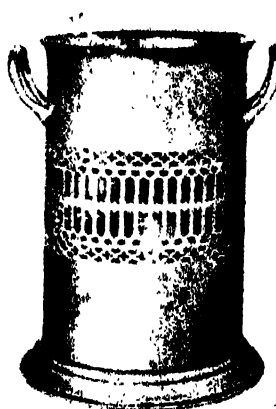
As soon as the liquid begins to simmer, remove the pan from the heat, and let it stand until it has slightly cooled, when it should be skimmed again and strained through a jelly bag or blotting paper.

Syrup should be boiled very gently. Also, while the syrup is boiling, check once or twice by adding a table-spoonful of cold water. For some dishes a very thick syrup is required, but the syrup out of a bottle can always be thickened to the necessary degree by reboiling it when taken out of store. Use loaf sugar in preference to granulated sugar. To test the syrup, if no sugar thermometer is at hand, pour it slowly from a spoon, or drop a little on a plate, and if it lifts a thread it is boiled enough.

If syrup is bottled when almost boiling and at once covered and tied down it will keep better. If fermentation should take place, put the bottle into a pan of boiling water, this will usually clear it.

Fruit Syrups. Any flavour added to syrups must be perfectly clear, if at all cloudy it should be clarified. When making a syrup with a fruit juice, either fresh or taken from a tin of fruit, no clarification is necessary. The juice should be strained through a hair sieve, the sugar added, also a little lemon juice, and the whole should be simmered in a saucepan to the required consistency.

Sweet jellies are brighter and clearer if syrup is used in place of raw sugar, but the proper proportions of liquid must be adhered to. Many excellent summer drinks can be made with syrup and flavouring if aerated water is



Syphon stand in pierced silver

added. For stewed fruit, tarts, and pastry fillings, syrup is not only useful but necessary as a sweetener. Another kind of syrup much used in cookery is golden syrup (see Treacle).

Syrup Cake. Sieve together 1 lb. flour and $\frac{1}{2}$ tea-spoonful bicarbonate of soda, rub into them 7 oz. margarine, and add 6 oz. sugar, and $\frac{1}{2}$ lb. ground almonds, mixing all well. Beat up 2 eggs in another basin, add to them 1 tea-spoonful golden syrup, and whisk the mixture well before stirring it into the dry ingredients. If necessary, the syrup can be

warmed slightly. Add also about 1 gill milk, then beat the whole for a few minutes before turning it into a greased cake tin lined with greased paper. Bake it in a moderately hot oven for about 1 $\frac{1}{2}$ hours.

TABLE. To the Jacobean age belongs the draw table, which, with improvements, came into favour again as a dining table in the 20th century. The dressing table and the work table developed on their own lines, and special tables, suited for special purposes, were produced, such as the wine table and card table. Folding tables are of considerable age, and from these were developed, in Cromwellian days, the gate-leg tables and, later, Pembroke tables. Many beautiful examples of walnut tables were made in the reign of Queen Anne, with cabriole legs often having shell ornaments carved on the knees. Later, Chippendale made many tables of many varieties. The illustration shows an artist's table with square legs and a typical Chippendale design in the strapwork carving. Hepplewhite and Sheraton also made and designed a variety of tables, and readers are referred to the entries on the styles of these great English designers. See Tea Table, etc.

TABLE CENTRE. This style of mat,



Table Chippendale artist's table in mahogany with strapwork carving; late 18th century. By permission of the Director, Victoria & Albert Museum, South Kensington.

formerly placed on the dining table when not laid for meals, or used as a decoration over the white cloth, is now usual only as the centre piece of a luncheon or dessert set of table mats. On festive occasions, such as a Christmas party, a special centre is sometimes devised to enhance the decorations. For instance, a gold or silver tinsel square or circle might be outlined with artificial holly leaves

and berries, or a square of ivory gauze stencilled with red flowers and silver leaves might form a table centre, to be surrounded with fancy sweet dishes and crackers.

TABLE CLOTH. For the dinner table it pays to buy good damask, not only because of its appearance, but also because it wears well and launders better than the cheaper kinds. For family use such a table cloth should be on the large side. There is no objection to its hanging down nearly to the floor at sides and ends, and if an extra leaf has to be put in the table the cloth will still be large enough. Some people favour table

cloths with drawn-thread borders or a hem-stitched or lace edge. It may be said that a fine damask needs no further ornament than an embroidered initial or monogram, but a less valuable one is sometimes improved by a little ornamentation not too elaborate, and lace crochet introduced into a linen dinner table cloth gives it a handsome appearance.

Table cloths for use at other than meal times are not often seen, owing to the liking for polished or painted surfaces and the hygienic dislike for anything that accumulates dust. See Appliqué Work; Breakfast; Drawn Thread Work; Embroidery; Linen.

quite as charming with its oblong linen place mats, covered soup bowls, pot of hyacinths and silver wire bread basket.

Laying for Dinner. Where the carving and serving are done at table, a carving cloth should be spread at the end. This may be an embroidered affair or a plain dinner napkin of good size. The sideboard is covered with a cloth, and also the dinner wagon or butler's tray.

In setting the table for dinner the place for each person can be marked out by a napkin. The necessary supply of cutlery, silver, etc., is placed on a small tray, which is carried round the room, so as to arrange each place correctly. Each person should have a large knife on the right hand, a large fork on the left hand for use with the meat course, with space left between to take the plate. A dessertspoon and fork may be placed horizontally in front, the spoon on the outside with the handle towards the right and the fork on the inside with the handle towards the left. Alternately, and more usually when entertaining, the dessertspoon and fork are placed with the other cutlery on either side of the plate. If a fruit salad or ice is to be served in individual glasses, a small spoon is often put beside the glass on the plate when handed to each person, and no dessertspoon and fork are laid.

If fish is to be served, the fish knife and fork are placed outside the large knife and fork. For soup a tablespoon, or special soup-spoon, is placed on the extreme right of the knives; a cheese knife is placed inside the other knives, or on the cheese plate, as shown in Fig. 1. When grape fruit is served a grapefruit spoon or a teaspoon is provided and a small fork or knife and fork for a savoury

TABLE LAYING AND DECORATING

Attractive Settings for both Everyday and Formal Meals

Other useful information on this subject will be found in the articles on Breakfast; Dinner; Luncheon; Supper. See also Christmas; Cocktails; Dining-Room; Flowers; Glass Ware; Hors d'Oeuvres; Napkins; Silver Ware; Spoon.

The art of good table laying is one which enhances the reputation of the housewife and hostess. Food can only be enjoyed when nicely served and with pleasing surroundings. More attention than ever is paid to the importance of colour, freshness and ordered arrangement of the table appointments, since it has been recognized that these things in themselves create a sense of personal harmony which is helpful to good appetite and digestion. On the decorative side it is easy to give either a tasteful, amusing or festive air to the table with inexpensive accessories and flowers to suit the season and occasion.

A few preparations have first to be made in the kitchen or pantry. The knives are wiped, the silver polished and special attention paid to the condiment containers, as an attractive table is impossible unless salt cellars are evenly filled, pepper pots are showing no trace of pepper dust, and mustard pots are supplied with freshly-made mustard. Any glasses on the table should be quickly polished with a clean cloth, and water jugs, etc., require the same attention before being filled. For the breakfast table it is most important that the butter and jam or marmalade dishes should look inviting.

The housewife decides whether she prefers a table cloth, table mats, or a sort of combination of the two by means of a linen runner and mats to correspond. The last arrangement is a favourite one for breakfast or luncheon and looks particularly well in coloured linens to harmonize with the table ware. All-over striped linen cloths are a good choice for the family breakfast table with napkins to match. There is great beauty about a plain damask cloth for the dinner table, but lace-edged mats will look more festive if the china ware and other appointments are simple. When a cloth is used the table should be protected by underlying baize, serge or felt; protective mats must be provided under linen or lace table mats. These protections can be dispensed with when a cold supper or luncheon is served.

An example of a wise choice of plain damask cloth is shown in Fig. 1. Here the table is laid for a small formal dinner party. Unity is achieved by the plain background to the ornamental glass, silver candlestick, sweetmeat and salted almond dishes, the patterned dinner service and the central flower arrangement of roses and gypsophila. Lace mats would make so much detail fussy and the appearance of the table less dignified. The possessor of Sheffield plate candlesticks, and a cake basket in which a glass bowl could be placed to hold the flowers, could use these appointments with equal success in such a setting.

A complete change of surroundings and ware makes Fig. 2 an equally striking and successful example. On a table with polished wooden top and metal legs, the soup bowls

are of the square shape that some English makers are favouring, and the mats are of glass. The centre-piece is of glass and steel and the two ibexes on either side of it are of silvered glass, while a tiny cactus is placed in a silvered pot at each corner. The menu cards are on heavy glass stands, the table silver and gold-rimmed drinking glasses are slightly less severe in design than the rest of the appointments, but the whole effect is bright, amusing and sparkling.

In a Queen Anne or Georgian style of room with a fine mahogany table surface, nothing could be in better taste than the setting illustrated in Fig. 3. Cut crystal glasses and flower bowl are the features; the condiment holders are of pierced silver with glass liners, and the mats of beautiful linen Madeira work. The simple luncheon table shown in Fig. 4 is

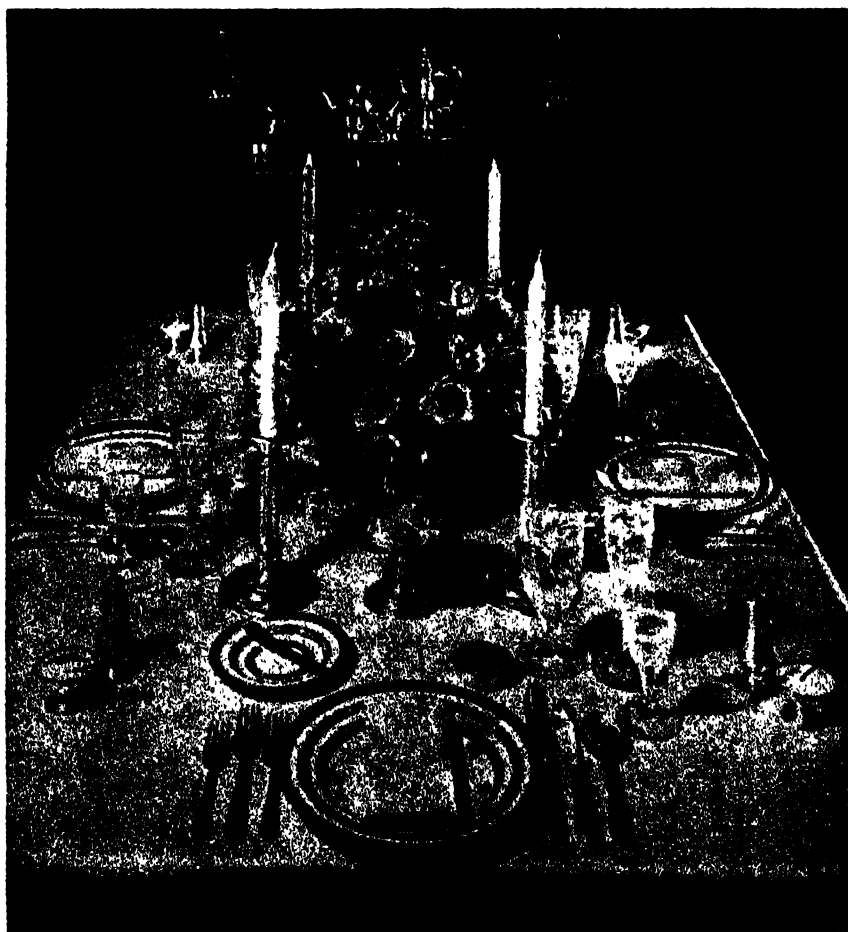


Table Laying. Fig. 1. Table laid for a formal dinner party, with a white damask cloth to set off the beauty of the patterned china, the glass and the flowers.



Table Laying. Fig. 2. A polished table surface is further enhanced by glass mats, steel and glass centre-piece surrounded by cacti in small pots and a pair of silvered glass libbes

Each person is given a tumbler for water and one or more wine glasses if wine is offered. Each person may be given a small slice of bread or a roll placed on the left hand, or the bread may be cut and placed on a salver or basket. Sometimes toast is served in one or two small racks.

Carvers and knife rests are placed at one end of the table in front of the person who does the carving and outside his own complement of knives and forks. Spoons and forks for serving the sweets, etc., are usually laid at the opposite end of the table. Fish slice and fork are placed outside the meat carvers and the soup ladle next to these. A sufficient number of salt cellars, etc., should be provided and placed at the corners of the table, as illustrated in Figs. 1, 4, or in the case of a small round or square table may flank the centre-piece. Cheese, butter, biscuits may be placed in readiness on the sideboard and also fruit dishes, etc., if dessert is to be offered, and in this case there should also be put ready a dessert plate for each person, with a tangerine-bowl containing about one-third of its depth of

clear water, a fruit knife, and a fork and spoon. A sugar bowl filled with castor sugar should be in readiness whenever fruit such as oranges, strawberries, etc., are being offered. Before dessert is laid on the table the used glasses,



Fig. 3. A simple old-world atmosphere is suggested by water lilies in a faintly tinted glass bowl, gleaming silver and out glass reflected in the polished table; graceful period chairs complete the harmonious effect

cheese plates, etc., are removed and the crumbs are taken off the cloth with a crumb scoop, kept in readiness on the sideboard. Coffee making equipment may also be placed there, as indicated in Fig. 1

Table Decoration. The choice of effective table decorations is almost limitless, and can therefore always be regulated by individual taste and means. For those who possess flower gardens, the problem of expense is practically non-existent except during a few winter months.

Any scheme for decorating a dining table should be influenced by the colouring of the room in general, and of the dinner service, lamp or candle shades in particular. When only two or three people are dining at a long table, and one end is not occupied, an important-looking decoration is a pleasant change when placed at this end instead of in the middle; otherwise a long or oval table is best with an extended treatment, a round or square table with a more compact one not too high to obscure the view across the table.

For luncheon or breakfast table pale yellows and blues are charming, but they are apt to lose their effect by artificial light. Violets, purples, and deep blues, also, are not good night colours. When shaded candles are used to light the table, flowers of somewhat more decided tones in harmony with the shades should be chosen for the decoration. Very large blooms are difficult to arrange, except when the size of the table allows of a somewhat massive decoration. Even then they are better when some lighter flower or feathery foliage is mingled with them in order to avoid a heavy or crowded appearance.

Coloured glass is often a deciding factor in a successful scheme. Cherry or ruby red glass on a white lace-trimmed cloth is enhanced by flowers of the same shade; while amber or pale green glass is beautiful with mauve. In early spring, on a mahogany table, with mats instead of a cloth, so that the polished wood is seen, a bowl of yellow tulips flecked with orange and arranged with red brown herbs is a simple and harmonious decoration.

Shirley poppies, daisies, and grasses are attractive for a luncheon table, and yellow roses in a sapphire blue bowl, lightly arranged with plenty of leaves, are a good choice with a dinner service which is patterned with green. For a hot night, coolness is suggested by pink roses in small cut crystal vases set round a block of ice in a large bowl; the table lit by pink-shaded candles in silver or glass candlesticks.

In winter, when flowers are expensive, a dish of fruit in contrasting colours is a good centre-piece for small vases of flowers or trails of autumn foliage. On a polished table, a pair of brightly coloured china birds or Chelsea figures are sometimes used at either end of a dish of fruit. Glass birds or animal-set on a piece of mirror glass form a bright decoration round a vase of glass flowers or a little green glass tree. Old silver gilt embossed spoons and small glass or silver dishes for sweets and salted almonds can also help towards the decorative scheme.

A miniature Japanese garden (see page 636), set in round or oblong pottery, with lacquered



Fig. 4. Luncheon table, with small individual cloths, covered soup basins, and heavy cut-glass tumblers

candlesticks and corresponding shades, is a change from flowers or fruit. A good Christmas decoration has for centre-piece a black Wedgwood bowl containing flowering bulbs of scarlet tulips and white Roman hyacinths, surrounded by holly leaves and berries, and groups of scarlet and silver crackers.

TABLE MAT. Protective table mats for meal service on polished tables are made of rubber, rush, raffia, linoleum, asbestos, cork, composition, glass, and wood. Ornamental mats to be used over these are of embroidered linen, either white or coloured, wholly of lace or crochet, or linen trimmed with lace or crochet. In some cases the protective mat is also decorative, as for example when made of raffia dyed in bright colours, or of cork stencilled with a pattern, or of painted glass, or of wood treated with bronzes and brush lacquer colours.

With transparent lace the colour of the protective mat underneath is important. Gilded composition or cork is used with good effect, otherwise the under mats are best when unobtrusively matching the colour of the table. For ordinary use rubber mats afford excellent protection; also they have the advantage of being thin, and the linen mats over them

do not slip when plates are removed. A set of protective table mats usually includes 6 round mats and 2 or 3 oval ones for dishes. All oval shapes can be bought if the linen place mats are oval. With larger square or oblong embroidered and lace mats many people dispense with protective mats and have service plates laid on the mats on which soup cups, etc., are placed. Small tray cloth designs can be traced on linen to make these, embroidered, and the mat either scalloped, hemstitched or lace edged.

A lace patchwork mat is illustrated in page 901, with full descriptions for making a charming set. For decorated cork mats see the article on Stencilling, and for gauze-dessert mats that on Pen Painting. In the article on Raffia directions are given for making simple woven mats, while the design for the tea-trolley mat in the same page could be used equally well for a table set. See Luncheon, Tray Cloth.

TABLESPOON. This name is given to the largest size of spoon used at the table. It is used as a soup-spoon, and for serving food. Tablespoons may be of silver or electro-plate. In giving medicine, a table-spoonful is $\frac{1}{2}$ a fluid ounce. See Silver; Spoon.

TABLE TENNIS: THE RULES OF THE GAME

A Popular Indoor Pastime for Winter Evenings

A number of articles in this work describe various indoor and outdoor games that are suitable for the home. Such include Billiards, Lawn Tennis,

Table tennis is a development of Ping Pong, which became popular in Great Britain about 1900. An association was formed, but after 1905 the popularity of the game waned and it ceased to exist, although there were Ping Pong leagues in various parts of the country, including Plymouth and Exeter. Each of these leagues, however, had its own rules. In 1921 the Ping Pong Association was revived and under its auspices national championship matches were held. In 1924 the term Ping Pong, as it was a trade name, was abandoned and table tennis was substituted. The Ping Pong Association was dissolved and its place taken by the Table Tennis Association, which in turn became the English Table Tennis Association in 1927.

Table and Implements. Tables specially made for the game can be purchased. The table should be rectangular, 9 ft. by 5 ft. in size, of solid hardwood, or of such material as will yield a uniform bounce over its entire surface of at least 8 in. and not more than 9 in. when a ball of standard size is dropped from a height of 12 in. The surface should be 2 ft. 6 in. above the floor. The net must be 6 in. high, and should fit close to the table and to its supports, and must be exactly in the middle of the table's length.

The ball, which is celluloid, should weigh between 37 and 39 grams. It should measure between $1\frac{1}{8}$ in. and $1\frac{1}{4}$ in. in circumference. The racquet can be any size, shape or weight. To day the best players use rubber racquets, which give great speed and spin on the ball.

Scoring. The method of scoring is by games, 21 points making a game. A match is usually the best of three or best of five games. Each player in turn serves until five points have been scored by the two players together. If the score reaches 20 all, the service changes with every point, and the game continues until one side is two points ahead.

Rules for Serving. The game can be played by two persons, or by four, two against two. In the former case each player defends one half of the table, these halves being known as courts. The one who serves is known as the server, and the other as the striker out. The choice of courts and of service is decided by tossing, but the following conditions must be

observed. If the winner of the toss decides to serve or to receive, his opponent shall be allowed the choice of court. The winner may, if he wishes to do so, leave the choice of service or court to his opponent.

When serving, the server must be behind the end of the table, and the ball, when struck, must be behind the end and also inside the limits of the width of the table. The server must so strike the ball that it will bounce once in his own court and then pass over the net into his opponent's court. The ball must be delivered from the palm of the server's free hand and no finger spin may be imparted. Nor must the ball be rubbed, against the surface of the racquet.

Faults. It is a fault and the server loses the point under the following conditions: when the ball does not strike the server's court prior to passing over the net; when the ball bounces more than once in the server's court; when the ball in play touches anything before striking the server's court; when the ball does not, after one bounce, cross the net and drop into the opposite court; when the ball, after bouncing once only in the server's court, touches any object apart from the net and its supports before alighting in the opposite court.

Lets. It is a let when the ball, being in service, touches the net or its supports after the first bounce, and then drops into the court beyond, and when a service or a fault is made before the opponent is ready to play. A let does not count to either side, and the stroke must be played again.

A return is good if the ball in play, after having bounced once only on a court, is returned on to the opposing court, after having been struck once only by the player's racquet, or by the hand holding the racquet. If the ball touches either the net or its supports, it is still a good return if it then drops on to the opponent's court. Volleying is not permitted. If a player strikes or is struck by a ball when it is in play inside the limits of the court and before it has bounced in his court he loses the point. He loses the point also if the ball bounces on his court and then touches any object apart from his racquet or the hand holding it, or if he drops his racquet and returns the ball with his empty hand.

The ball is dead or no longer in play, and the point counts against the player who made the stroke, in the following circumstances: when the returned ball strikes any object, apart from the net or its supports, prior to dropping on to the opposing court; when the ball, having been played, touches the player's court before going over the net (this does not apply to the service); when the ball, after passing over the net, goes beyond the limits of the table without dropping on it.

If either player touches any part of the net or its supports with the racquet or any part of his body while the ball is in play, the ball becomes dead and he loses the point; when a ball drops on the proper court and screws back over the net, the player whose turn it is to strike may reach over the net and play the ball, so long as he otherwise makes a good return. If he fails to play the ball, his opponent scores the point notwithstanding the fact that the ball has returned over the net. A player loses a point if he touches the table with his free hand.

The phrase table surface is to be interpreted as including the top edges and corners of the table top, and a ball in play which strikes these latter is therefore good and still in play, though if it strikes evidently the side of the table top below the edge, it becomes dead and counts against the last striker.

The Game for Four Players. The above rules are also applicable to the game in which four persons play, but for this there are certain other regulations. The table must be divided down the centre at right angles to the net by a line $\frac{1}{2}$ in. wide, so that the table is divided into four courts. All services must be delivered so that the ball bounces first in the right hand court at one end and then in the court diagonally opposite. After the service, the two players on each side must return the ball alternately, or lose a point.

The pair who have the right to serve the first five services in any game shall decide which partner shall do so, and the opposing pair which shall first be striker-out.

The first five services shall be delivered by the selected partner of the pair who have the right to do so, and shall be received by the selected partner of the opposing pair. The second five services shall be delivered by the striker-out of the first five services and received by the partner of the server of the first five services. The third five services shall be delivered by the partner of the server of the first five services and received by the partner of the striker-out of the first five services. The fourth five services shall be delivered by the partner of the striker-out of the first five services and received by the server of the first five services. The fifth five services shall be delivered as the first five services, and so on, in sequence, until the end of the game or the score is 20 all. Then the sequence of serving and striking-out shall continue, but each player shall serve only one service in turn until the end of the game. In the deciding game of a match, the pair that served first has the right to alter the order of striking of the pair striking-out when the score first reaches 10.

TABOURET. A tabouret is a seat or stool with neither arms nor back, the top being stuffed and upholstered. Tabourets are chiefly stools of the period of William and Mary and Queen Anne, 1688-1714.

TACKING. The stitch known as tacking is a temporary one, being used to hold a hem, seam, or other part of a garment in position while the permanent stitches are put in. Coloured cotton should be used for tacking white materials and white cotton for dark materials, so that the stitches can be easily distinguished.

Begin the tacking by knotting the cotton at one end and pushing the needle straight

through the material. Work from right to left, and make the tacking stitches about $\frac{1}{4}$ in. long and to lie a little above the line where the permanent stitches are to be made. After pushing the needle through to the wrong side, bring it out again $\frac{1}{4}$ in. further on in a line horizontal to that where it was put in, and continue to the end of the work in this way.

Tacking should be finished with a back-stitch. When removing tacking stitches, care should be taken to see that the material is not torn or puckered. See Basting.

TACSONIA. These climbing plants are suitable for the hothouse or moderately heated greenhouse. It is of vigorous growth and is suitable for training on a trellis beneath the roof glass. They belong to the passion flower family and bloom chiefly in summer and autumn. The plants may be set in large tubs or flower-pots or in a well-drained border, a compost of loam, leaf-mould and sand is suitable. A minimum winter temperature of 55 degrees is necessary. The finest sorts are *Magnus*, reddish-violet, *manicata*, scarlet, and *Van Volkemii*, scarlet.

TAFFETA. The most popular variety of this cloth is silk taffeta, which is crisp, with a peculiar dull lustre. Silk taffetas, because of the methods used in making them, are, however, inclined to split in wear, and for this reason they cannot be regarded as hard-wearing. Wool taffeta makes an excellent shirting, and is a superior fine flannel made in tasteful patterns. Cotton taffetas are especially good as shirtings, and are generally dependable in colour and wear.

TAGETES. This is the botanical name of the French and African marigolds, two valuable summer and autumn flowering plants. They are grown as half hardy annuals and raised from seeds sown in a heated glasshouse in February. The seedlings are transplanted into boxes of soil to give them room for development and are hardened off and planted out of doors early in June. The African marigolds grow 2 ft. or so high and

bear large, round, lemon or orange-coloured flowers which make a striking display in the herbaceous border. There are both tall and dwarf French marigolds, the latter being very useful as edging plants; the double and single flowers are various shades of yellow, or yellow marked with reddish brown. Legion of Honour, yellow and brown, is a favourite dwarf variety.

TAIL PIECE: On Chairs. This term is used for the continuation of the seat backward seen in Windsor chairs. It forms a necessary attachment to the diagonal spars in a stick-backed type of chair. It is usually quite short and of the thickness of the seat. The diagonal spars fixed to it are useful for stiffening the piece. See Chair.

TALCUM. There are a number of uses for talcum or tale, which is a soft, greasy mineral, varying in colour from silvery white to yellow and green; it is a magnesium silicate. The name is also applied to mica, and it is used as chimney gas for gas burners and for windows in some kinds of heating stoves. Another use for tale in the home is in the crushed or powdered form as toilet powder. Powdered tale is employed as a lubricant, and, mixed with varnish, makes a shiny coating for wallpapers.

When crushed, tale has the property of reflecting light, and when spread over a comparatively large area it imparts a certain lustre to the material. This effect is made use of in the preparation of a number of fabrics with a shiny surface, the result being obtained in some cases by the use of a special tale preparation. Tale is also employed under the name of French or Spanish chalk.

Medical Uses. Tale has also certain medical uses. On account of its smoothness, prepared tale is often used as a dusting powder for babies; boracic acid powder is generally added and a trace of perfume. Venetian tale, which comes from Tirol, is especially soft and smooth. Lassar's paste, a protective and soothing application for irritable and inflamed skin disorders, may be made with tale as follows: Zinc oxide powder and powdered Venetian tale, of each 2 drams; vasoline or soft paraffin, $\frac{1}{2}$ oz.; salicylic acid powder, 10 gr. Mix into a paste and spread on soft linen or surgeon's lint.

TALLBOY. A tallboy is made up of a double set of drawers, one upon the other. This piece of furniture was first made in England in the latter half of the 17th century. The early ones are of walnut, beautifully grained wood being selected to veneer the pieces. A fine example is illustrated, which shows the characteristic Queen Anne features of burr walnut veneer, brass handles and discreet use of marquetry, the bottom drawer alone being ornamented in this manner.

The tallboy belongs to the walnut period of furniture at its best, but at a later date was made in mahogany. The typical piece has 3 or 4 long drawers in the lower part, and 3 in the upper. In the upper there are also usually 2 smaller drawers. The piece rests on 4 short club legs, and beneath the drawers is an arched shaping. The upper part is usually narrower than the lower, from which it is separated by a simple moulding. The decoration is not elaborate, taking only the form of deep moulding at the top and chamfering or reeding on the front angles. See Chest of Drawers: Queen Anne Style.

TALLOW. Tallow is an animal fat largely consisting of stearin, palmitin and olein. The highest grades are used commercially for the making of candles and the lower grades in the manufacture of soap and creosoting leather. Tallow can be used to some extent as a lubricant in cases where rope or cord runs over a pulley. Fishing and other lines are rendered

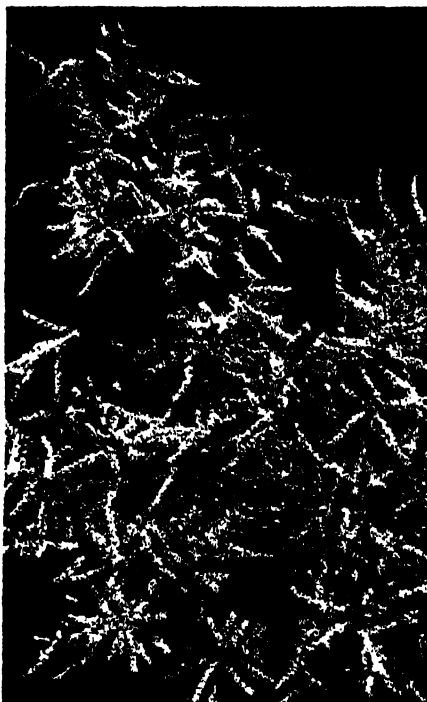
more or less waterproof when rubbed with tallow.

Tow impregnated with tallow can be employed for the making of joints in the stuffing box or gland of pumps, etc. See Tow.

TAMARIND: The Fruit. The fruit of the *Tamarindus indica* is imported from the E. and W. Indies in the form of a reddish brown pulp mixed with sugar. It has an agreeable taste, contains a large quantity of citric and tartaric acids, is a refreshing drink for fever patients, and is slightly purgative.

For children tamarind spread on bread and butter is a good laxative medicine. A refreshing beverage for the sick may be made by boiling 1 oz. in a pint of water. Tamarind whey is made by boiling 1 oz. in 14 pints of milk, or stirring it into boiling milk. The dose of tamarind is 2 to 8 drams. It is usually used with other purgatives; for example, in confection of senna.

TAMARISK. This is a hardy flowering shrub with slender, graceful, leafy stems and rose-pink flowers in early or late summer. It

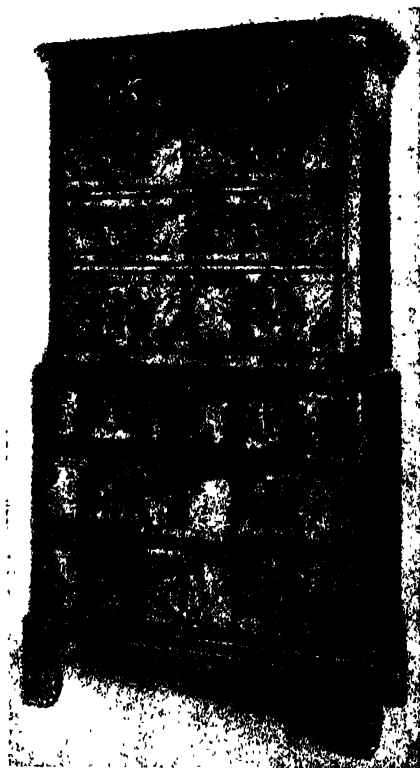


Tamarisk. The feathery heads of small rose-pink flowers of the *Tamarix pentandra*.

reaches a height of from 4 to 8 ft. or more. The tamarisks are particularly suitable for planting in seaside gardens, where they are often used as hedges. The common tamarisk is *Tamarix gallica*. It bears pale rose-pink flowers in May. *Tetrandra*, which flowers at the same time, is more beautiful; both should be pruned after flowering if necessary. *Pentandra* (*Hispida aestivalis*) is a charming shrub with rose-coloured inflorescences in late summer; the shoots should be pruned in spring. Tamarisks thrive in ordinary soil and are increased by cuttings inserted in sandy soil out of doors in autumn.

TAMBOUR. This is a method of constructing a lid or shutter to a writing-table or bureau. It was used among others by Hepplewhite and Sheraton. The sliding lid of a toll-top desk is an elaboration of it. Sheraton made bookcases in this style. The lower part is enclosed in a sliding shutter composed of beads made to slip in grooves.

TAMMY CLOTH. Sauces and soups that depend for success upon their smoothness are usually passed through a tammy cloth made of



Tallboy. Queen Anne tallboy is beautifully grained walnut with inlays in the bottom drawer representing rays of the sun. Height 6 ft. 2 in.

Courtesy of GUTH & BELGATE, Ltd.

fine woollen muslin. The cloth is spread over a basin or other receptacle, its edges gathered in the hands to form a well in the centre and the mixture poured in. The two ends of the cloth are then twisted in opposite directions until all the mixture has been forced through. If the latter is especially thick and cannot be tamined in this way, it may be rubbed through the cloth with the aid of wooden spoons.

Immediately after use the tammy cloths should be washed in warm water to which a little soda has been added, rinsed well, wrung out, and dried in the open air. See Jelly.

TANGERINE: The Fruit. The small Tangerine orange is used as a dessert fruit, and also for various forms of sweets. It makes an excellent marmalade, and the juice is used to flavour fondants, icing, sweets, and a delicate filling for cakes.

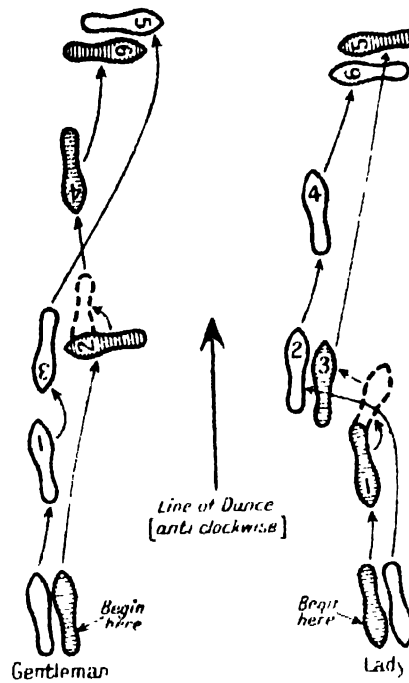
The filling for cakes can be made from the following recipe. Boil 3 eggs hard, then pound the yolks fine with 3 oz. butter or margarine, 4 oz. icing sugar, the grated rinds of 2 tangerine oranges, and sufficient of the strained juice to form a soft cream. Spread this filling between two sponge sandwiches, and dust the top with icing sugar. This cream spread between shortbread biscuits is delicious.

Meringues may be flavoured with tangerines. Grate the rind of one or two tangerines and add them to the sugar which is used to sweeten the whipped cream for the filling.

Tangerine Chips. These make an excellent garnish for cakes, biscuits or fondant sweets. To prepare them, remove the peel from several tangerine oranges and shred it in long, narrow pieces, then place these in a basin, cover them with water and lay them aside till the next day. In the morning strain and weigh them, and take an equal weight in castor sugar.

Put the chips into an unlined, bright metal saucepan and strew the sugar over them as they warm, shaking and tossing them about over a moderate heat until they appear perfectly dry. Store in a dry place and keep the chips covered up tight. The pulp of the oranges should not be thrown away: it may be used for other sweets.

Tangerine Drop Cake. Tangerine peel may be used to flavour light drop cakes. Rub $\frac{1}{2}$ lb. lump sugar, lump by lump, on the outside of 3 Tangerine oranges until the sugar has absorbed the zest, then pound the sugar in a mortar until it is a fine powder. Separate the yolks and whites of 4 eggs, beating both by themselves and then together, then by degrees beat these into the flavoured sugar until spongy.



Tango. Fig. 1. Showing the six steps of the reverse turn. See text for full description.

Mix in very lightly 54 oz. fine sifted flour, to which has been added a pinch of salt. Drop this mixture with a teaspoon on to a tin lined with grease-proof paper. Bake in a fairly quick oven, decorate each cake with a Tangerine chip attached with a little marmalade jelly, then cool on a wire, and store in a covered tin. See Fondant; Marmalade.

TANGO. The tango differs from other modern dances in that the dancers walk the steps instead of gliding them, the knees consequently being more relaxed, although they should not be bent; all the man holds his partner a little farther to his side (on his right hip), his left forearm being bent in more. Both dance with the right side of body slightly in advance of the left, consequently the right foot is turned in a little and the left turned out to the same degree.

There are two rhythms to be followed in this dance, the slow (S.), in which each step occupies one beat of the music, and the quick, quick, slow (Q.Q.S.), in which the quick steps

take half a beat each and the slow step one beat. The basic steps are as follows: (1) The Walk; (2) Progressive side step (Fig. 2); (3) Reverse turn (Fig. 1); (4) Side promenade (Fig. 3); (5) Back corté (Fig. 4).

The Walk (S.). The walk forward consists of natural length, ordinary walking steps, the weight of the body being kept over the front foot. The back foot is left behind until the last possible moment before stepping forward with it. The step is counted "low" and takes one beat of music. The body being held with the right side a little in advance of left, contrary body movement (C.B.M.) is consequently used when stepping forward with the L.F. For the walk backward swing leg well back from the hip, going on to ball of foot and keeping weight on front foot. As step continues weight is carried between the feet and the toes of front foot should leave the floor so that all pressure is on front heel. Weight is then transferred on to ball of back foot. The back heel should not be lowered until the front foot passes it. The front foot should remain in front until the last possible moment before stepping back with it. The right side of the body being held in advance of left, the contrary body movement position occurs when stepping back with the R.F.

Progressive Side Step (Q.Q.S.). Following a walk forward with the R.F., the man steps forward and across slightly to R. with L.F., takes a small step to the side with R.F. and steps forward and across slightly to R. with L.F. The girl, having taken a walk back with the L.F., steps back and across slightly to L. with R.F., takes a small step to side with L.F. and steps back and across slightly to L. with R.F. In this step the contrary movement position occurs on the first and third steps for both man and girl (Fig. 2).

Reverse Turn (Q.Q.S., Q.Q.S.). The man steps forward with L.F., turning on it to L., takes small step to side with R.F., still turning, and crosses L.F. over in front of R.F., steps back with R.F., turning on it to L., takes small step to side with L.F., and closes R.F. up to L.F. The girl steps back with R.F., turning on it to L., nearly closes L.F. up to R.F., still turning, and closes R.F. up to L.F., steps forward with L.F., turning on it to L., takes small step to side with R.F., and closes L.F. up to R.F. On the first three steps half a turn is made. On the last three, a quarter turn (as shown in the diagram) or no turn at all (Fig. 1).

Side Promenade (S.Q.Q.S.). The man steps to side and very slightly back with L.F.

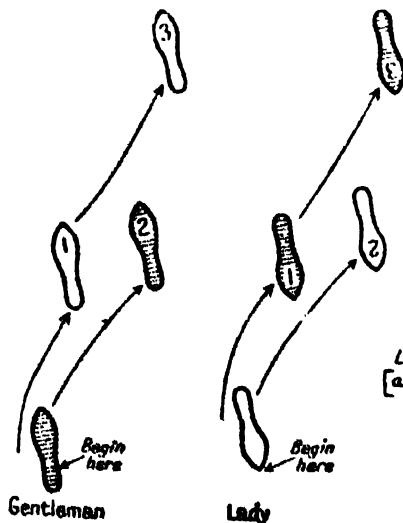


Fig. 2

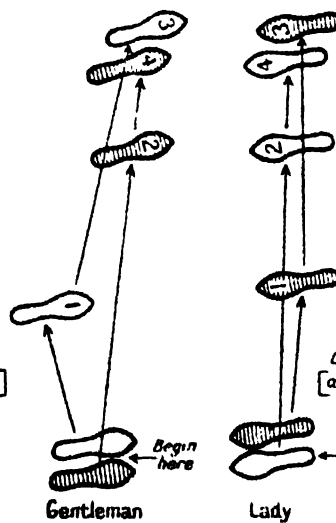


Fig. 3

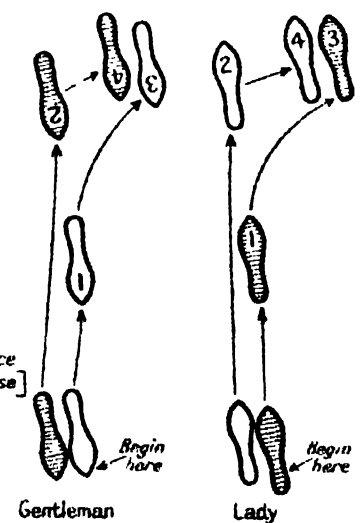


Fig. 4

Tango: three of the basic steps. Fig. 2. Progressive side step; it usually follows a walk forward with right foot. Fig. 3. Side promenade, in which the dancers cross one foot over the other. Fig. 4. Back corté. Throughout the dance the right foot is turned slightly in, and the left foot slightly out.

crosses R.F. well over in front of L.F., takes a small step to side with L.F., and closes R.F. up to L.F. The girl steps to side with R.F., crosses L.F. well over in front of R.F., takes small step to side with R.F., and closes L.F. up to R.F. Contrary body movement is used on the second step (Fig. 3).

Back Corte (S.Q.Q.S.). The man steps back with L.F., back with R.F., turning very slightly to L., takes small step to side with L.F., and closes R.F. up to L.F. The girl steps forward with R.F., forward with L.F., turning very slightly to L., takes small step to side with R.F., and closes L.F. up to R.F. Contrary body movement is used on the second step (Fig. 4).

In the accompanying diagrams the R.F. is shaded, the left shown in outline only. The dotted outline indicates the ultimate position of foot. It will be easier to follow diagrams if the dancer faces the direction in which the toes are pointing and turns the diagram at the same time. See Dancing, Footwork, etc.

Tank. See Cistern, Gallon.

TANKARD. The modern tankard is a plain drinking vessel usually large enough to hold a pint of liquor and made of silver, pewter, glass, or earthenware. Tankards are either open or with lids. Genuine antiques, and tankards reproduced from old styles, are nearly always lidded. The tankard is shaped somewhat after the style of the flagon (q.v.), but the latter is another type of drinking vessel, and whereas tankards vary from about 6 to 9 in. in height, 7 in. being usual, flagons were as much as 15 in. in height, and more cumbersome pieces.

Tankards are sometimes of old Sheffield plate, but more frequently of silver and copied in the plainer style of pewter. The lid and hinge are the chief points of interest, in the older examples a thumbpiece on the hinge strap is placed so that the lid can be easily raised. Both handle and thumbpiece were often artistically decorated. The thumbpiece was cut in two main shapes, a horizontal cork-screw and bifurcated. Fine tankards occasionally have a lion thumbpiece, and in later examples this is sometimes fluted.

Dating from the end of the 16th century to the reign of Charles I, tankards were straight-sided, but often richly chased and ornamented with repoussé designs. Very plain styles with flat lids followed in Puritan times. Restoration tankards were massive, with cylindrical bodies, flat lids, and engraved with coats of arms and crests. Queen Anne tankards were for the most part fairly plain, but elegantly shaped, and often embellished by gadroon ornament to edge the lid and base, or by beading round the body of the tankard. A knob appears on the lid occasionally. This disappeared on the domed lids of Georgian tankards (see page 1144), many of these pieces being belled, and the thumbpiece, or purchase, well in evidence.

What are known as pig tankards have small pieces fixed inside, in a line with the handle, the object being to regulate the quantity of liquor to be drunk on ceremonial occasions in honouring each guest. See Pewter, Silver.

TANNIC ACID. Oak galls and oak bark are sources of tannin or tannic acid, which is a brownish powder with a strongly astringent taste. Common preparations are: glycerin of tannin, suppositories of tannic acid, and lozenges of tannic acid.

Tannic acid is an efficient astringent, lessening the discharge of fluid from any ulcer or mucous surface to which it is applied. It is also a powerful haemostatic, as it clots the blood flowing from a vessel. The powder can be used as a snuff to check nose bleeding.

Internally, tannic acid is used in the form of an infusion to check diarrhoea. It can be used in a douche to check leucorrhoea. The glycerin of tannin, 1 part to 8 parts of water, is an astringent gargle in sore throat.

TANSY. This is a small family of hardy herbaceous perennial plants. The average height is about 2 ft., and the yellow, daisy-like flowers are borne in summer. Seed should be sown in spring, in ordinary soil. The value of the ordinary tansy, *Tanacetum vulgare*, is in its leaves, which are used for flavouring puddings, and for decorating dishes. Costmary, *T. balsamita*, is grown for the salad value of its leaves. Tansy tea is an old-fashioned country remedy. All species can be increased by division of the roots, in autumn. See Herb Garden.

TANTALUS. A tantalus is a small upright wooden stand used as a receptacle for spirit bottles, in which the latter are locked up, visible but "tantalingly" out of reach unless one has the key. The bottles are of cut glass, and generally number two or three.

Tap : For Screw Threads. See Stocks and Dies.

TAP DANCING. This form of dancing consists in tapping rhythms with the feet, with or without music. The dancer's hips, ankles and knees should be flexed, the arms relaxed and the body moved in rhythm with the feet. The tap itself is a short, sharp movement of the foot from the ankle, making one sound and finishing off the floor. There are six taps, as follows:

The forward, a sharp beat with the ball of the foot in the forward direction; the back, a similar beat in the back direction; the straight, in which the foot is raised slightly, striking the ground vertically; the toe, in which the toe strikes the ground sharply to the rear; the heel, when the ball of the foot remains on the ground with the heel raised, then the heel strikes the ground sharply; the ball, with the heel on the ground and the toe raised, the ground being struck sharply with the ball of the foot. All these taps finish off the floor by lifting the foot after the tap.

The three beats in tap dancing are toe, heel, and ball; these are the same as taps but finish



Tansy. Leaves of *Tanacetum vulgare*, a valuable addition to the herb garden.

on the floor. The various movements include the following: The hop, a spring on one foot; the spring, or pump from one foot to the other; the pump, a spring on both feet; the step, transference of the weight of the body from the heel to the ball of the foot; the walk, transference of the weight of the body from the heel to the flat of the foot; the brush, a forward or backward movement, similar to the forward or back tap but made from the hip and knee instead of from the ankle; the skull, a stamp of the foot carried forward and finished off the floor; the stomp, the foot pushed forward on the ball and the movement finished with a heel beat; and numerous others.

TAPS: THE HOUSEHOLD TYPES

Hints for the Handyman on Fitting and Repairs

This article deals with the leading form of domestic water tap. For article on Frost and Water Supply should be consulted for further information. See also: Plumb, House Pipe, Hot Water Supply, Sink, Pipe, Plumbing, Soldering.

The water taps in general use in the home are of two classes, known as plug and screw-down taps.

The plug tap consists of a body and a plug, the body having a passage way through it which is crossed at right angles by a second passage-way tapered in shape. This is occupied by a similarly shaped piece of metal known as the plug. The plug has a hole through it lineable with the first or through-way hole. When the plug is turned in its socket so that the hole in the plug is opposite that in the body, the liquid passes through. When the hole in the plug is at right angles, the through-way is closed and no liquid can pass, if the plug is a perfect fit in the socket. This kind of tap is used for water at low pressure. A similar type is used on gas pipes.

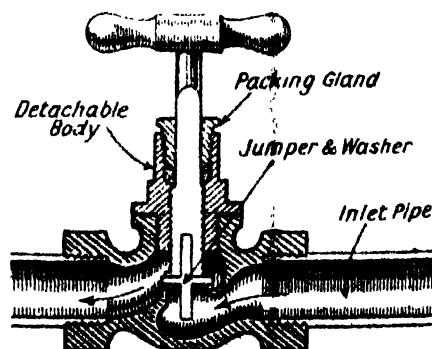
The screw-down tap consists of a handle and screwed rod which turns in the upper part of the body and has at the lower end an enlarged portion known as the jumper. This can be raised or lowered under the action of the handle, the function of the jumper being to close or open an aperture between an upper and lower water-way formed in the body of the tap. The construction is clearly indicated in Fig. 1, which illustrates a stop cock. Fig. 2 shows a lab cock with the jumper nut and washers removed. A pillar valve for baths and lavatory basins is illustrated in Fig. 3.

Screw-down taps are generally used on all water fittings in connexion with public sup-

plies, as they are durable and reliable in use and tend to minimize wastage of water. It may be noted that some considerable pressure of water is needed to operate the screw down tap, so that it is useless fitting this type to a rainwater tank, for example. A plug tap should be used for such purposes.

In Figs. 2 and 3 the component parts are indicated as follows: A, handle and barrel; B, jumper; C, jumper nut; D, washer; E, joint washer; F, body; G, cap; H, fixing nut; J, union piece and nut.

The tap usually fitted to water pipes for domestic purposes (Fig. 2) is known as a



Tap. Fig. 1. Sectional view, showing principal parts of the screw-down type of stop cock.

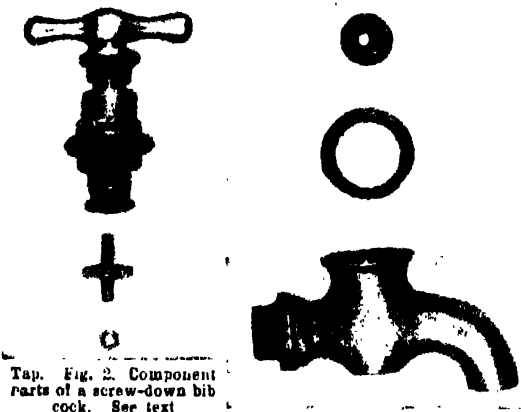
screw-down bib cock. The components are clearly shown, as they have been taken apart in their proper order. The body is seen at the bottom, right; above it is the washer which makes the joint between the body and the barrel watertight. Next above the washer is the jumper washer (top, right), and jumper with retaining nut (bottom, left). The jumper seats on to a valve face within the body, and is practically the only part that is likely to give trouble. It is replaced when needed with a new washer, which can be obtained in various sizes from ironmongers. A washer of a special material is needed for pipes on the hot-water system. As soon as the pipe commences to drip, and water is not easily turned off, a new washer should be fitted. Sometimes the jumper nut gets corroded and will not unscrew; in such a case it is best to fix a new jumper and washer complete.

The barrel at the top consists of a stuffing box to keep the joint between the screwed part of the handle and the barrel watertight. The lower part of the barrel is threaded to screw into the top of the body. Usually this part is screwed left-handed, that is, the barrel is unscrewed by turning it backward, or against the clock. It is sometimes fitted with a set-screw to prevent it from screwing. This should be looked for at the start, removed if present, and the barrel can then be unscrewed with a large spanner applied to the hexagonal part at the bottom of the barrel.

The same principle is adopted with stop cocks and other taps, including the pillar types of bath and lavatory basin valves, an example of which is illustrated in Fig. 3. The internal structure and arrangements are similar to the foregoing, but the outlet from the body is set at an angle to enable the tap to stand in a vertical position. This has the advantage that the pipes can be more readily erected and are less obtrusive, as they can be hidden to a large extent behind the basin or bath.

As will be evident from an inspection of Fig. 1, there is a right and a wrong way to fit a stop cock, the correct way being with the lower of the waterways towards the direction of flow of the water. This is because the water as it passes the jumper and washer is then able to lift it off its seat, and thus there is a minimum of friction in passing. If the tap be arranged the other way round, the water will tend to force the jumper down and thus partially choke the waterway, and there will be much more pressure needed to force the water through the stop cock. On some makes of tap the jumper is positively attached to the spindle by a floating joint, and this joint automatically lifts the washer and jumper from the valve seat.

TAP BOLT. Alternatively known as a stud bolt or cap screw, the tap bolt, which has a square or hexagonal head, is employed in metal work when an ordinary bolt and nut cannot be used. Examples are found on many



Tap. Fig. 2. Component parts of a screw-down bib cock. See text

forms of domestic work, as, for example, when a small part has to be securely attached to a base plate or other part. The screw passes through a clearance hole in the part to be attached, and bites in a thread cut into the main part of the apparatus. See Bolt; Nut.



Tap Bolt for use in metal work

these take up room in the workbox.

Linen tape is naturally stronger and more durable than cotton tape, and, although usually

unbleached, it whitens in the course of washing. Tape makes an excellent substitute for twine, especially in packing stationery and books. Stationers sell special tape for such use, as well as red cotton tape for tying documents and narrow green silk tape for batches of typewritten sheets.

Special tape is also made for heading and gathering curtains, which pulls out flat for washing. These headings ensure good pleating and are supplied in all colours and in various widths.

TAPE GRASS. The half hardy, ornamental grass with small white flowers, which is known as tape grass, is suitable for indoor pools, aquaria, or water basins. It should be potted up in a small receptacle filled with rich

loam, and placed at the bottom of the water garden in springtime. It requires a mean temperature of about 60°. Tape grass is also known as eel grass. There is only one important variety of it.

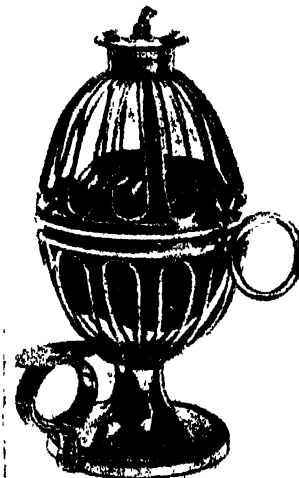
TAPE MEASURE. A good tape measure is an indispensable adjunct to the workbasket. It is, as the name implies, made on a strip of material which looks like tape, usually about 1 in. wide, and is finished off at one end either with a metal tab or a loop. The length is usually 50 in. and is divided into inches on one side and centimetres on the other. The whole can be rolled up neatly and put away in the workbasket without taking up valuable space. Similar measures are made in narrower widths in a box or reel which contains a spring. This draws the measure back automatically when the end is released and involves no winding.

TAPER. Wax tapers bought by the dozen are useful in the house for lighting up purposes, especially with incandescent gas. They are obtainable in colours and in white. The heavier make of white tapers can be inserted in a brass holder which can be adjusted to the length of the taper, and prevent it curling up at the end when a few inches have been burned.

Such a holder is convenient when hung near the gas cooker for lighting one burner from another with the taper contained and for preventing the fall of drops of wax.

Taper Holder. This antique was designed for holding a tiny candle or a coiled wax taper when the introduction of sealing wax made some device for melting it a necessity on the writing table. Good specimens in silver and Sheffield plate are greatly valued to-day by collectors. The holder took three main forms, a stick, a box, and a jack. The stick resembles a small candlestick and is also to be found in brass. These pieces followed the standard candlestick patterns. Some have a chimney glass as a protection for the flame against draughts.

The box is a small, rounded canister, about 3 in. across. It has a loose lid, through the centre of which is a tube which holds the taper. An extinguisher is often attached to it, as it is to the candlestick. The jack is a less familiar piece. Sometimes it, too, was supplied with an extinguisher. The example illustrated has a cage of flat wire work and a side handle, by which it was held. The ring is fixed to the taper bar round which the long wax taper was coiled except the small portion in use which comes through the hole in the top. Another type of wax-jack without the cage is illustrated in page 1134.

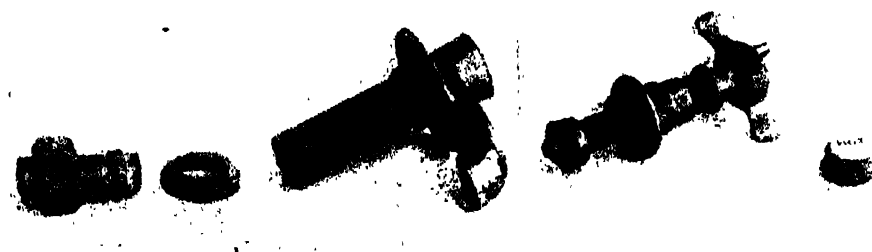


Taper Holder. Wax-jack type of holder in Sheffield plate, about 1800

TAPESTRY. The word tapestry is used to cover a range of decorative pat-

terned fabrics, the design rather than the texture determining the classification. Thus a type of machine-woven furnishing material, carpets, wallpapers and needlework, are all spoken of as tapestry. The real thing is confined within the limits of its handwoven texture, of which the design forms an integral part. It may be woven on an upright or a horizontal loom, but the resulting fabric is the same. Tapestry was woven in Egypt many centuries B.C., while beautiful fragments exist of ancient Greek work. Although made in France from the 14th century, important manufactures were first established in England in the 17th.

A textile is not tapestry in the strictest meaning of the word, even when handwoven on a loom in which a double warp (vertical thread) is used and the shuttle carrying the weft (horizontal threads) is thrown between the warps to their full width, the interlocking of the textile being accomplished by use of



Tap. Fig. 3. Parts comprising a pillar valve, as used for baths and lavatory basins. See text



Tapestry Example of modern pictorial tapestry based on a Renaissance design used as a mural decoration in a hall

the treadle, which brings first one set of warp threads to the top, and then the other.

Real tapestry is bobbin woven. One set of warp threads only are used, and the bobbin passes the weft by hand in and out of each warp thread alternately. Only the weft threads are seen on the surface, presenting the design with the ribbed or rep appearance, exactly the same on both sides, which distinguishes the genuine fabric. In the article on looms a simple tapestry pattern is shown being woven on a string warp, and the principle of the weaving is demonstrated by the illustration.

Of all textiles, tapestry is the most durable, as this complete interlocking of warp and weft produces a web which is almost indestructible in ordinary usage; but it will be readily understood that even modern real tapestry must be a costly production when it is considered the time, patience, and artistic skill required to produce a yard, copying the forms by use of the number of colours and shades which go to the making of a fine design. Old pieces fetch prices beyond the purse of the ordinary buyer, except by some lucky chance. Anyone possessing genuine tapestry which has been cut or torn should have it repaired at a tapestry studio; otherwise it may be irretrievably spoiled.

The three great epochs and corresponding centres of tapestry making were, in the 14th and 15th centuries, Arras (the name of the town becoming a synonym for tapestry hangings); in the 16th, Brussels; in the 17th, Paris, when the Gobelins workshops were assumed by Louis XIV to become the finest centre of the art. At this period the ateliers at Aubusson and

Beauvais were also flourishing, and at Mortlake in England fine work was being carried out.

Designs are classed under two broad headings, verdure and personnages. The former may be of massed foliage only, or also introducing flowers and fruit; the style known as mille fleurs, in which flowers and leaves are scattered in profusion over the ribbed ground; the landscape designs, for which the workshops at Beauvais were particularly famed. Mille fleurs and landscape designs often introduce figures and animals, but the main interests of flowers and foliage class them as verdure.

Personnages designs, as the name implies, are figure pieces, battle and hunting scenes, cartoons and copies of pictures in which people are the chief interest. Heraldic or armorial tapestries were usually surrounded by borders of verdure. In old tapestries made for mural decoration borders were an important part. Panels are completely bordered by a narrower design or on three sides with inscriptions at the bottom, while lengths, originally part of hangings which covered whole wall surfaces, usually display a border top and bottom.

Besides this broad classification based on type of design, which embraces all periods, tapestries are also classed as Gothic, Renaissance and Later French, and these terms are often used by modern decorators in speaking of various patterns. The Gothic designs of the Middle Ages, which are considered the finest, are flat in drawing and almost without

perspective. Fewer gradations of colour were used, and in consequence the patterns have stood the test of time, while subtler shading has become blurred in more recent work.

Some of the loveliest Gothic designs, copied to-day for mural panels or to upholster valuable chair-frames, are the mille fleurs. In the Renaissance designs attempts were made to copy the lifelike style of the painting of this period. The later French period tapestry, often spoken of as Louis and sometimes as Aubusson, where a great deal of it was made, chiefly shows the charming designs inspired by the paintings of Boucher and Watteau; dainty and delicate in colour and treatment, these are largely reproduced to-day for covering white and gold or gilt frame chairs and settees.

Simulated Tapestry In the machine-made jacquard tapestries effects are well reproduced at a moderate cost. This fabric is made in panels to copy tapestry pictures with verdure borders, varying in size from big wall-pieces to cushion covers. It is also made by the piece, repeating the all-over verdure design, and sold by the yard. It has splendid wearing qualities, and its texture looks better next to a polished wooden surface than a dull one. The charming effect in a hall of such tapestry in a pictorial form is shown in the illustration. Block printing by hand of a good tapestry design on a horizontally ribbed material, simulating the real tapestry texture, is another form of imitation for mural purposes. The colouring and designs used are good, and at a little distance the effect is rich and pleasing. Above a dado carried out in oak block printed rep looks its best. Pictorial and other tapestry effects are carried out in needlework, using the stitches described in the subsequent article.

Painted tapestry in imitation of the Gobelin tapestries has a foundation of corded or rep canvas over which the designs are painted. Its resemblance to the genuine tapestry is due to the particular kind of canvas of which it is made, for the real Gobelin tapestry has also a corded ground, though the designs are woven, as already described, instead of painted. The painting is done by experts, and the finished article is therefore somewhat expensive.

Tapestry carpets are imitations of Brussels. In tapestry wallpapers the verdure designs are copied in pleasant colourings. Sometimes figures are introduced, or landscape panels. See Living-Room; Louis Style; Loom.

TAPESTRY NEEDLEWORK: STITCHES & DESIGNS

Embroidery for Chair Seats, and Other Canvas Coverings

The article explains the practical application of this decorative handicraft in the home. See also Appliqué; Cross Stitch; Embroidery; Laid Work; Queen Anne Style; Rug; Stool; Victorian Style; Woodwork

Included under the heading of tapestry needlework are all the canvas embroideries in which the stitchery covers the whole ground-work of the fabric and in which the work is done on counted threads. This type of embroidery was done in England in early Tudor days and continued in use for wall and bed hangings until the end of the 17th century, and on, when it became the fashion for chair, settee and stool seat coverings. In Victorian days it was much used also for firescreens, draught screen panels, footstools and tapestry pictures. On stools and chair coverings, opaque white and crystal beads were frequently introduced as high lights on the patterns. In some examples of older work silk thread is used for the same purpose and some needle tapestry is embroidered entirely in silks.

Materials Required. One of the most fascinating things about the work for furnishing purposes is that designs can be obtained or evolved which suit any type of room and furniture, but in which the same simple stitch or group of stitches are employed,

however intricate the appearance of the work when completed. Another immense advantage is durability. It is therefore wise to use the best wools for embroidery, and canvas for foundation. Materials, including designs with colour charts, canvas already traced for working, or with the patterns outlined and colours suggested by painting them on the fabric, wool and silk embroidery threads, canvases in a variety of meshes, needlework frames and needles are stocked by all good art needlework shops and departments in stores. Work can also be reshaped if pulled, or mounted when finished if required.

Tapestry wools vary in thickness according to the nature of the work, canvas and design. For a large piece of work such as a chair seat, which will be required to withstand constant wear, a heavier type of thread is required than for a bag design embroidered on finer canvas. Among other excellent makes of wool are Pearll's tapestry and crewel wools, White Heather embroidery wools, Penelope crewel and tapestry wools, and others.

Wools are all made in a wide range of colours and are obtainable in small skeins.

Silk threads should not be used for upholstery covering as they do not withstand wear. In several old pieces where silk threads have been introduced into portions of the original work the wool worked portions are unimpaired, but the silk ones have perished. Silks are however useful for brightening smaller designs for pole fire screens, cushions, cosies, blotters and purses. Artificial silks, owing to their brilliancy, are often liked for this purpose. For very fine work stranded cotton and Filoselle silk threads are recommended as the strands can be split and any thickness used that the worker requires. Mercerized embroidery cottons are sometimes employed, and wear well, but nothing can beat the beauty of wools for this form of embroidery. Tapestry wools are best used for heavier work, light crewel wools for fine petit-point embroidery on such articles as bags.

Tapestry is worked on either a single thread canvas, or double thread Penelope canvas and a variety of meshes are obtainable according to whether the design requires a fabric having many holes to the inch or comparatively few. For instance, there might be 120 stitches across a design, and if the work was required to measure 12 inches across when finished, the canvas should have 10 holes to the inch. Double strung canvas is best for covering furniture. The canvas is obtainable in single and double widths when bought by the yard. Special blunt pointed tapestry needles should be used for the work.

For large pieces of embroidery it is wise to use an embroidery frame, but this is not necessary for a smaller piece. A frame simplifies the task as there is a tendency for the work to pull crookedly. Should this happen the remedy is to damp the work thoroughly on the wrong side, place it face downward on a piece of clean cotton cloth on a board and tack it flat to the board, testing with a ruler to see that the work is stretched to the exact shape required when finished and leave it to dry.

Colours and Designs. For all fine needle tapestry it is essential that colours should be subtly graded. The richness of pattern is obtained by the use of 4 or 5 shades of one colour in proximity and by the contrasted plain colour of the solid background. Expert workers get wools specially dyed according to their colour charts. When copying some of the older designs it should be remembered that colours were originally brighter and probably cruder. This is especially the case with greens. The lovely blue-greens of the old Jacobean work are to a great extent the result of accident. The blue dyes employed endured, while the yellow were fugitive. The most delicate pinks and yellows in many Queen Anne period pieces have in some places faded to indeterminate whitish shades.

Artistic workers use undyed tapestry wool for these, the natural tint of the wool giving exactly the right tone when used as the lightest member of a group of greens, reds and pinks, blues or yellows. Another hint which can be applied when embroidering a cover for a period chair or stool is to change the pale shades slightly in the repeats of the pattern to give the partially faded effect of mellowing age. The result is to make the new cover belong to the frame instead of proclaiming its modernity at a glance. If in spite of careful choice of "old" colours to suit period pieces the result is still too crude, the tapestry may be dipped in tea and then tacked to a board or frame to dry and preserve the required shape.

While art needlework shops supply designs elaborately prepared there are many pieces of beautiful work which can be done directly on the canvas by counting stitches and follow-

ing clear charts of designs and colours. The pattern motifs are always worked first and the plain backgrounds put in afterwards.

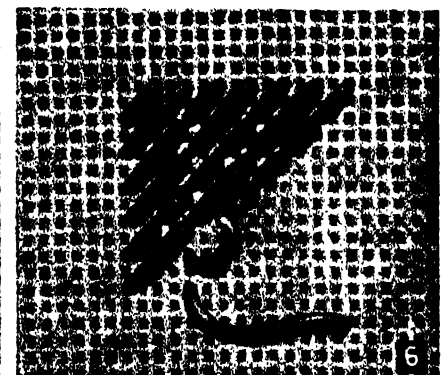
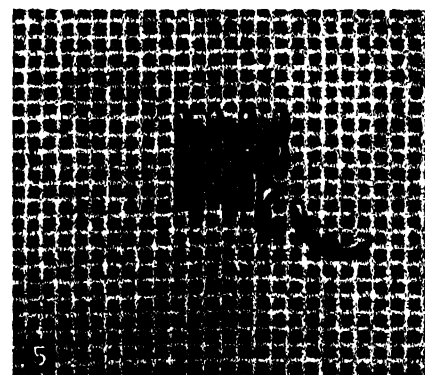
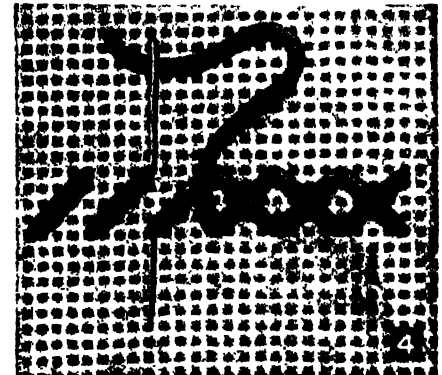
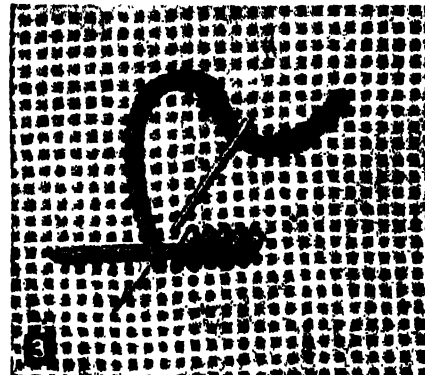
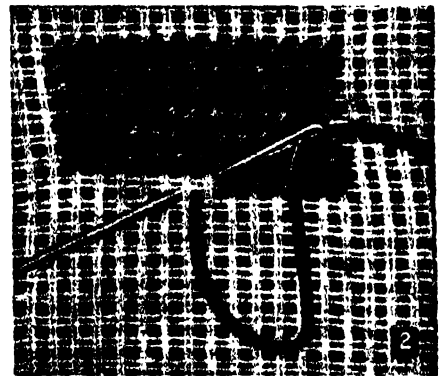
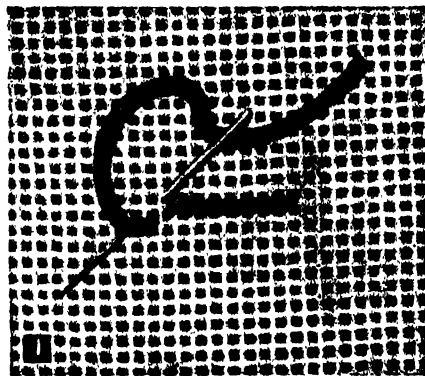
Period designs are obtainable in Florentine (Lun), Gothic, Gobelin, English 17th century, Queen Anne, Chippendale, Adam, Victorian and also in Louis styles. The last are often used for embroidering beautiful bags, and a typical one is illustrated in Fig. 11, with its landscape motif surrounded by a scrolled frame and floral pattern. A great help to anyone who wishes to work a cover for an antique stool or chair is to visit the Victoria and Albert Museum and study the needlework covers of furniture in the collections there. For the most part earlier designs show a tendency to all-over patterns, which have again appeared in tapestry work for quite modern pieces, particularly Florentine patterns consisting of vandykes or wavy lines in which the rich effect is gained by use of varied colours. Many of the later designs were composed of central floral or pictorial motifs, either surrounded by fancy borders or a plain continuation of the background stitchery.

The Stitches. The stitches most used in needle tapestry are petit point, gros point, cross-stitch, straight Gobelin stitch and mosaic stitch. Whole pieces can be worked

in either of the first two stitches. Petit point is often known as tent stitch, finest effects being gained by it on a small-meshed, single-thread canvas. This stitch is worked diagonally over one thread of the canvas and is actually worked from left to right upward diagonally, but the row always progresses from right to left, as shown in Fig. 1. For alternate rows the work is turned upside down. Fig. 2 shows the same stitch on double thread canvas.

Gros point is worked in the same way, but over two threads or two sets of double threads on a double-thread canvas. This stitch is greatly used for chair seats and for groundings. A padded effect is gained by laying a thread as shown in Fig. 3, between the threads of a horizontal line of the canvas, and working the stitch over it. Do not pull the wool tightly when working over a coarse canvas as it is a sign of bad stitchery when the canvas threads show through. Some workers use double wool for heavier types of design on coarse meshes. Do not thread the needle with more than about 20 in. of working thread.

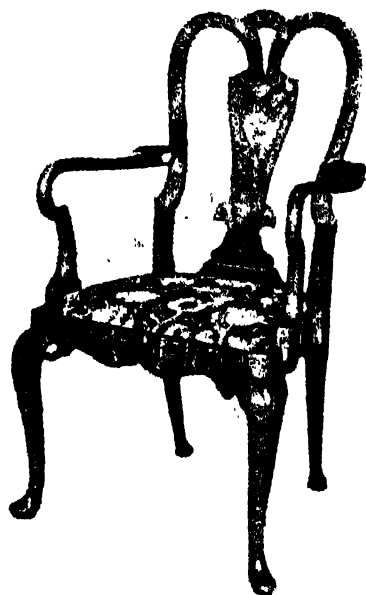
Cross-stitch for tapestry is usually worked over 2 vertical and 2 horizontal single or double threads of the canvas. To ensure an even appearance stitches must be crossed the



Tapestry Needlework: stitches most used. Fig. 1. Petit point on single thread canvas. Fig. 2. Tent stitch on double thread canvas. Fig. 3. Gros point over a laid thread. Fig. 4. Cross-stitch as worked in tapestry. Fig. 5. Straight filling stitch. Fig. 6. Mosaic stitch.

same way. In a pattern each stitch should be finished singly, but when working a grounding it is permissible to work the first half of the stitch along a row and return crossing. In Fig. 4 the stitch is enlarged to illustrate detail.

Straight Gobelin stitch is worked in horizontal rows for groundings. The thread is carried vertically over 2 threads of single



Tapestry Needlework. Fig. 7. Queen Anne style chair with a drop-in seat covered by a piece of tapestry needlework in a design of the period. Courtesy of Bartholomew & Petcher.

thread canvas (or 2 double threads of double-thread canvas), leaving each time one thread of material between the stitches. As clearly shown in Fig. 10, the effect is vertical and not diagonal. This stitch is used to imitate the ribbed grounding of Gobelin woven tapestries. A straight rising stitch shown in Fig. 5 and a wide of ligne Gobelin stitch are sometimes used

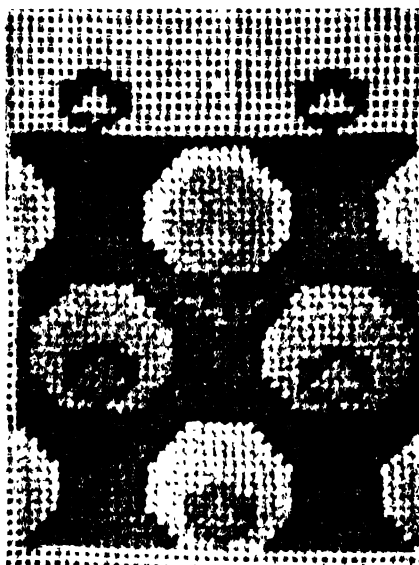


Fig. 8. All-over pattern of a single conventional floral motif repeated at regular intervals, a suitable design for the chair shown on the left.

The latter covers 2 vertical and 3 horizontal single or double threads of the canvas, and advances one thread of the canvas at a time. Mosque stitch makes another useful grounding, as shown in Fig. 6. It is worked along the 1st row with a long slanting stitch and a short one alternately. The 2nd row completes this by adding the second short stitch. The 3rd row is like the 1st and the 4th row like the 2nd. The final row is all of short stitches. A stitch used in Florentine patterns is worked in slanting lines, the thread being carried alternately over 2 and 4 crossings of the canvas, the stitches in the 2nd row being short where those in the 1st were long, and so on to cover the canvas. There are many other

stitches which the experienced worker uses occasionally. Sometimes stitches seem to evolve of themselves to suit the particular pattern, but the beginner is advised to use the simple ones until proficiency is gained in keeping the work flat and the stitchery even.

To secure the first stitch when a laid thread is not used, a knot is made at the end of the wool, the needle passed through the canvas from the right-hand side about $\frac{1}{4}$ in. from the starting point. As the work proceeds from left to right after a few stitches the end of wool is caught in at the back. Afterwards fresh lengths of wool are darned in at the back of the stitches. When using a number of shades of the same coloured wool, knot the cut skeins loosely on to a wooden curtain ring, keeping all the greens together, all the pinks, etc.

Furniture Coverings. The Queen Anne style elbow chair in Fig. 7 shows the beautiful effect of a needle tapestry covered seat. The design is an all-over floral one of the period, worked in petit point in wool on a double-thread canvas. A cover for a chair or stool with a drop-in seat is easier to make up than one for an over-stuffed frame. When the work is finished, the loose seat is taken out, the tapestry stretched over it, and brought smoothly down to the underside. Tacks with large heads are obtainable, which are placed at frequent intervals to secure the work to the under framework of the drop in seat. This is then neatened with a piece of hessian, the edges of which are turned in under itself. It is important, when measuring the canvas to be embroidered, to allow a good margin for turning.

A conventional floral pattern is shown in Fig. 8 which could be used with any style of furniture, but would look best for



Fig. 9. Circular piece of tapestry worked for a stool covering. Fig. 10. Portion of same design showing detail of petit point stitches used for pattern and straight Gobelin stitch for grounding.

a chair of the style illustrated. It is carried out in gros point on a double-thread Penelope canvas with 12 threads to the inch, using tapestry wools. Sufficient canvas should be bought to allow a 4-in. margin all round. This pattern has only one motif, so that the beginner becomes quickly used to working it, and in each alternate row of motifs the colours are the same. Thus the 1st row of these conventional flowers could be done in two shades of pink, with a yellow centre, outlined with maroon, and pale green used for the stem. The 2nd row of flowers have dark green stems and are outlined with the same shade, filled in with deep rose and crimson brown and yellow centres. It will be noticed that part of the centres of a row of flowers are worked at the top of the illustration,

repeating the colours of the 2nd row underneath. The centre of the canvas is first marked and an upright line drawn through it. The rest of the fabric is then spaced out into squares, the size of each recurring motif. The grounding is put in last, also in petit point, and could be in stone colour, of a dull fawn or black according to the colour scheme of the room.

A charming central floral design is shown in Fig. 9. This is worked on single-thread canvas in petit point for the pattern, and in straight Gobelin stitch for the grounding, and could be used for a round stool or, by filling out the canvas with the grounding stitch, could be used for an oblong or square stool. The delicacy of the pattern is greatly enhanced by the different stitchery employed. Fig. 10 illustrates a portion of the design enlarged to show the detail. The roses, carnations and leaves are worked first in natural colours on a stone coloured or grey blue background. Begin with the central flower. About 30 small skeins of wool are required for a footstool.

Bags and Pochettes. For bags worked with beautiful designs in petit point the finest canvas is used, and in some cases silk Filoselle is employed for the design and in others fine wools. Occasionally silks are employed for portions of the design only. Pochettes are often worked on rather coarser meshed double-thread canvas and with tapestry wools, as they are more handled and used for ordinary occasions, while the bags in finest embroidery are reserved for the evening.

A bag in petit point with a simple floral wreath or posy would require $\frac{1}{2}$ yd. of 23-in. wide single thread canvas, a bag frame about 6 in. across, and silk for lining. The shape of the front of the bag is marked out on the canvas, making it the width of the frame across the top, 5 in. deep and curving out the sides with rounded corners at the bottom. The design on the front might require about 20 skeins of coloured silks, while the back of the bag and the grounding would require about 12 skeins of the same shade. A bag of the same shape as the one just described is illustrated in Fig. 11, but a beautiful design of this type requires to be traced for working. Such designs on canvas ready for working can be bought in a number of patterns.

In gros point or petit point conventional patterns of stripes, triangles, encroaching squares and circles are all easily worked, and patterns can be copied from modern woven fabrics for pochettes and larger bag coverings. Shaded vandykes worked in wide Gobelin stitch or in a straight stitch taken vertically over 3 holes are most effective for bags with wooden frames. It may, however, be remembered that no stitchery is so durable as petit point or cross-stitch on a medium meshed canvas. The longer the stitch the greater the possibility of threads being caught and pulled out of shape in handling and wear. The making up of bags and pochettes is described in the article Bag. They can also be made up in needlework shops. Some workers merely damp their finished embroidery on the



Tapestry Needlework. Fig. 11. Bag in which a Louis style design is worked in petit point with silks on fine canvas

wrong side and tack it on to a covered board to stretch it back to the required shape when finished, others find that it is best to press the tapestry with a moderately hot iron, placing the work face downward on a thickly padded ironing board.

Tapeworm. See Worms.

TAPIOCA. In cooking, tapioca, which is obtained from the roots of the cassava plant, is used to make puddings, soups, and jellies, and also forms a good thickening agent. It is nourishing and easy of digestion, and therefore may be included in invalid diet. Tapioca requires long cooking, and should not be placed over too fierce a heat. The grains vary in size. The fine kind may be cooked in the same way as semolina.

A cold sweet that requires little preparation is orange tapioca. To make it, put $\frac{1}{2}$ lb. small granulated tapioca into a pan with a little more than a pint of water and the grated rinds of two large or three small oranges. Simmer the whole until it clears, then draw the pan to the side of the heat, and add $2\frac{1}{2}$ oz. sugar and the strained juice of four oranges. More sugar may be used if the fruit is sour. Let the mixture cool before turning it into a deep glass dish, and serve with cream or custard.

Tapioca Cream. A good sweet with tapioca and desiccated coconut as its main ingredients can be made in the following way: Wash 3 oz. tapioca, then let it soak for 12 hours or more in a pie-dish containing 1 pint water. Any water that has not been absorbed when the soaking is over should be poured off. Mix in 3 oz. sugar and 2 tablespoonfuls desiccated coconut, add 1 quart milk, and bake the whole in a warm oven first bringing

it to the boil and then cooking it slowly for 1 $\frac{1}{2}$ hours. This can be done by lowering the temperature of the oven once the mixture has reached boiling point.

Serve it cold, with 1 gill slightly whipped cream on top, and 1 table-spoonful desiccated coconut sprinkled over the cream. Apricot sauce (q.v.) may be served separately.

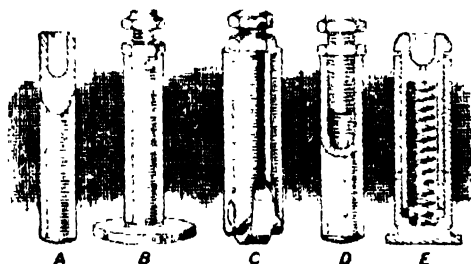
Tapioca Pudding. To prepare this, wash 3 tablespoonfuls tapioca, let it soak for an hour in 1 $\frac{1}{2}$ pint milk, and then turn it into an enamelled deep pan, adding a piece of margarine about the size of a hen's egg, $\frac{1}{2}$ table-spoonful sugar, and the thinly peeled rind of a lemon. Boil these up slowly, and then simmer until the tapioca grows clear. Take out the lemon rind and let the mixture cool at the side of the heat before stirring in the yolks of 2 eggs, and then the stiffly beaten whites. Pour it into a greased dish, and bake it in a moderately hot oven until a set, and the top is lightly browned. Tapioca and apple pudding can be made in the same way as sign and apple pudding (see page 1088). See Diet Food, Semolina.

TAPPET. In internal combustion engines of the side valve type the tappet, which is a part of the valve gear, is fitted between the end of the valve stem and the face of the cam of the cam-shaft. A similar device is used on some overhead valves operated by push rods, though a pivoted lever is often used which carries a roller at its free end, the roller bearing against the operating cam. Diagrams illustrating both systems are given in the article on Valve.

Owing to the fact that the face angle of the cam as it makes contact imparts a thrust sideways during the initial stage of raising the tappet, the guide is eventually worn oval. To overcome this fault, anti-friction devices, as shown at C, are frequently employed that provide a rolling instead of a sliding contact.

The feature of the adjustable tappet, which is most commonly used, is that the amount of clearance between the end of the valve stem and the head of the tappet may be definitely set and fixed. This makes it possible irrespective of wear of the parts, to maintain the valve gear, in respect of tappet noise, in good order. Although tappet noise is primarily due to faulty setting of this amount of clearance, other contributory causes are worn cams, worn tappet rollers, and slackness of the tappet in its guide.

The method of adjusting tappet clearance is illustrated on page 801.



Tappet: representative types. A, D, motor cycle patterns; B, side valve type; C, tappet with roller; E, pattern used for overhead valve operated by push rod

The gap of a few thousandths of an inch can be tested by a feeler gauge of the correct size. The maker's instructions should be followed on this point, but as a guide it may be noted that the clearance for most water-cooled engines is about 0.004 in. for inlet valves and 0.003 in. for exhaust valves.

In the case of overhead valves the clearance is generally a little more. Tappet clearance should be adjusted when the engine is hot.

Valve gear would be almost silent but for the fact that the varying length of the valve stem, caused by engine temperature, makes it impossible to provide permanent contact of the tappet with the face of the cam and the stem of the valve. Tappet noise can be reduced to a negligible quantity, however, if careful attention is given to the adjustment at a time when the engine is thoroughly warmed up. See Cam; Motor Car; Valve.

TAR. Its Domestic Uses. Tar is obtained by the destructive distillation of coal, wood, and bituminous materials such as

be carried out in warm weather and only old clothes should be worn.

Tar is applicable in the form of a paste to such purposes as the floor covering beneath a boarded floor. In such a case the tar is mixed with the aggregate, which may be very small pieces of clean broken brick or ash well worked into a stiff mass and laid in a similar way to a cement or concrete floor. This takes some weeks to set, and then the floor boards can be laid directly on it. If the

well done, is invisible if a clear or crystal lacquer be employed.

To remove tarnish stains from silverware wash the objects in hot water with a trace of ammonia in it, following this with a good washing with clear hot water and finishing with a rouge polish. Tarnished brass and copper ware can usually be cleaned with a very weak solution of sulphuric acid in water. Add the acid drop by drop to the water. Only a trace of the acid must be used, as it is very violent in action and would speedily corrode the metal. The articles should be thoroughly washed afterwards in hot soda water to neutralise the acid bath, and then polished, and, if desired, lacquered.

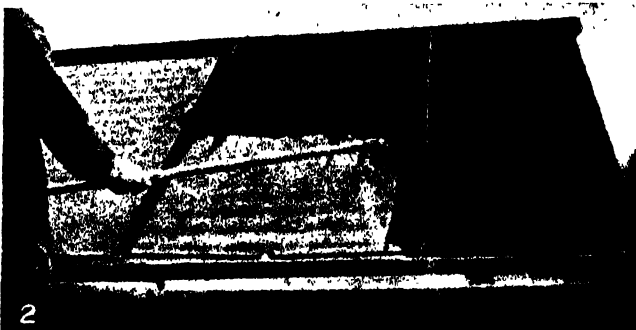
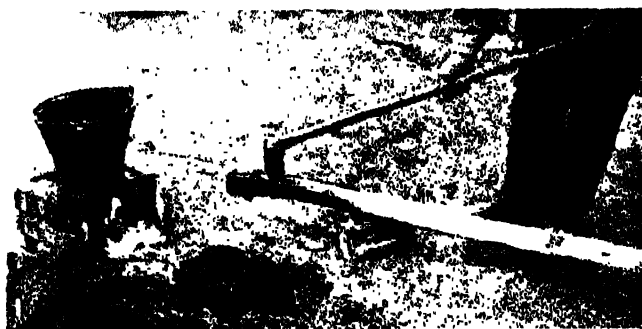
Another method of treating tarnished silverware is to rub it well with a solution of powdered magnesia and follow with a polishing with the dry powdered magnesia, finishing in the usual way. Steel and iron are best cleaned with a mild abrasive. For slightly affected pieces this may be a light sprinkling of fine emery on an old stocking moistened with a few drops of lubricating oil. When the tarnishing is severe the best plan is to use the finest old emery paper and finish off with a good metal polish. See Lacquer; Polishing.

TARRAGON. This is a hardy perennial herb belonging to the Artemisia, or wormwood, family. About 2 ft. in height, it is raised from young roots planted about 1 ft. apart in spring. The shoots will be ready to cut down in autumn and store away for future use. Roots may also be started in the heated greenhouse in October for winter use. Propagation is by division of old roots, which should be done annually.

Tarragon is used in cookery for flavouring soups, and vinegar, and forms an ingredient of many sauces. The whole leaves serve as a garnish for cold dishes. See Vinegar.

TARSO. This is a method of cutting a design on wood which gives it almost the appearance of inlay. It is a modern form of the old tarsia and affords a simple method for the amateur to decorate such surfaces as screen panels and trays. For the latter, when glazed it would be almost indistinguishable from marquetry. Many pokerwork designs can be adapted to this work by those who have no outfit for the former craft. More or less conventional designs can be carried out effectively, and the outfit is of the simplest, consisting of a tarso or cutting knife, a supply of stains in various colours, and some polish.

The satisfactory appearance of the finished tarso depends largely upon clear, even outline, and therefore it is best to work on a flat panel. A box should not be taken for a first attempt unless books are built up alongside level with the top to provide a support for the hand. It is better to begin on



tar. Fig. 1, showing use of tarpot and fire and method of tarring the butt of a post before fixing it in the ground. Fig. 2, Tarring a roof with a stiff-bristled brush fixed to a long handle

shale. The black semi-solid mass left as a residue after further distillation of the tar itself is commonly known as pitch. Tar can be had in a semi-liquid state or as a solid material. Liquid tar is applied cold, but may require slight heating in cold weather. Solid tar or pitch is broken up into small pieces and can be put in an old iron bucket, supported on bricks, and a fire kindled underneath to melt it, as in Fig. 1.

This must be done in the open and well away from anything that is likely to catch fire. The workman should wear a coat containing tar heated over a gas lamp or a fire and iron.

The tar should be heated just sufficiently to render it fluid enough for use. If it catches fire it burns fiercely and emits volumes of pungent smoke; it can be extinguished, though not without difficulty, by smothering with damp sand.

The use of tar in the household is due chiefly to its waterproofing qualities, which render it particularly suitable as a protective covering for wood and metal. This property is taken advantage of in the coating of wooden roofs and other wooden structures which are exposed to the weather, but care should be taken to apply such a coating only where there is no particular risk of fire. Iron fences are often coated with tar to protect the metal from rust, and a fence treated in this way looks well and also lasts for many years if additional coats are applied from time to time. On account of its waterproofing qualities tar is also employed for damp-coursing.

Liquid tar is applied with a specially made stiff-bristled brush; this is shaped somewhat like a short-haired sash tool, but the bristles are spread out at the ends. One pattern is made with a short single handle, the other variety has a long handle, and the brush head is set at an angle to it. The tar-pot brush is made with 1, 2, or 3 tines or sets of bristles, which are mounted on a cross piece of wood and attached to the handle in much the same way as a garden rake.

Roofs and walls of outbuildings are often covered with tarred felt or similar material which has to be tarred frequently to keep it in good condition. This can best be done with a good grade of liquid tar or one of the preparations having tar as a base. It is applied with the long-handled tar brush as shown in Fig. 2, and the worker should stand so that the brush can be manipulated at one side of the body, as this tends to keep the person reasonably clean. Tarring operations should

undersides are tarred and a film of tar be brushed over the floor surface the result will be as nearly as possible damp proof.

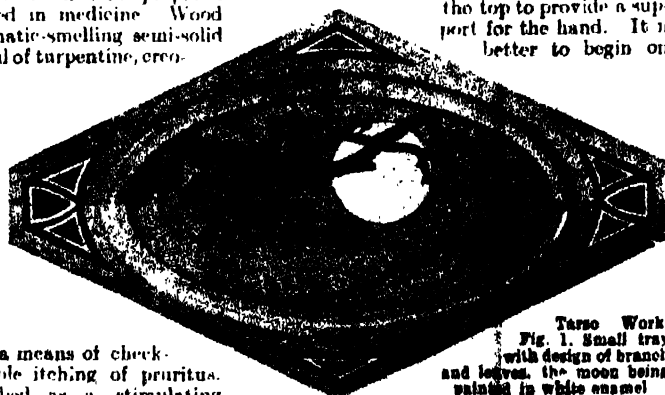
Tar can be employed effectively in the top treatment of a path. A simple method is to prepare the surface of the path, which is assumed to be of ashes or gravel. The top is then brushed clean and the tar applied hot, and well brushed into the surface. This is followed by a sprinkling of sand or fine grit, and as the tar sets the surface is well rolled. A damp sack should be rolled up and rested on the framework of the roller, and secured to prevent it becoming displaced. The sack is placed so that it rests on the top surface of the roller, and acts as a brush to keep it clean. It should be damped from time to time. Tar with stone dust can be used as a substitute for asphalt in laying a path. The method is described in the article on Path.

Medicinal Uses. Wood tar and prepared coal tar are both used in medicine. Wood tar is a blackish, aromatic-smelling semi-solid substance containing oil of turpentine, creosote, phenols, resins, and other constituents. Juniper tar oil or cade oil and birch tar are used in chronic skin diseases, usually incorporated in ointments. Tar ointment is used in the treatment of chronic eczema and psoriasis.

The diluted ointment is also often used with success as a means of checking the very irritable itching of pruritus. Wood tar is prescribed as a stimulating expectorant in chronic bronchitis or winter cough.

Coal tar is the source of a large number of drugs, such as antipyrin, etc. and numerous disinfectants are manufactured from it.

TARNISHING. The best way to prevent tarnishing is to have the objects lacquered when such a course is possible, as this, when



Tarso Work. Fig. 1, Small tray with design of branch and leaves, the moon being painted in white enamel

something small and fairly simple in design, such as the tray in Fig. 1, which shows a branch and leaves in tarso work with a full moon, which is filled in with liquid white enamel. Another good design is illustrated in Fig. 2, which would be equally suitable for an empty grate screen panel or for a blotter. The colours used would be dark brown, green,



Tasso Work. FIG. 2. Panel showing a boldly outlined design of an eagle and trees

black and white. The incision should be about $\frac{1}{8}$ in. The design should be followed very carefully, and the various lines cut correctly. Cut anything that lies underneath first, the rest of the design later. When all the lines are incised, the panel should be sandpapered, working with the grain, never against it. Finish this stage by clearing off with the back of the sandpaper.

The next step is to colour the design by painting, in water stains with a brush. The stains should be used almost pure, and made to look even and solid. It is an excellent plan to add 1 drop of ammonia to the stain before using it, to prevent the colour from spreading. No shading should be attempted, the aim being to make the design look as though it is indel and not painted on. The background is left uncoloured. The colours are left to dry; if not sufficiently dense, any part that needs strengthening should be coloured again. Rub lightly with old sandpaper before polishing.

TARTAR: On the Teeth. The deposit of tartar which tends to form about the roots of the teeth consists of phosphate of lime and other mineral substances, mixed with some organic matter. This tends to favour the activities of microbes and provoke decay of the teeth. Tartar is more likely to accumulate when food is soft than when a fair amount of it requires energetic mastication. See Teeth.

TARTARE SAUCE. This sauce is made by adding $\frac{1}{2}$ dessertspoonful each of chopped parsley, capers, gherkin, tarragon, and chervil to $1\frac{1}{2}$ large breakfastspoonfuls mayonnaise. Keep it in a cool place until required.

TARTARIC ACID. The crystals of tartaric acid irritate the skin and mucous membranes. Obtained from grapes, tartaric acid closely resembles citric acid, and is used similarly, chiefly as a refrigerant or cooling medicine in fevers. The dose is 5 to 20 gr.

It is used in making effervescent preparations; 20 gr. of the acid dissolved in $\frac{1}{2}$ oz. of water will saturate, in an effervescent mixture, 24 gr. sodium bicarbonate dissolved in 1 oz. water. It can be used instead of citric acid for lemonade (q.v.).

TASSEL. This form of trimming is frequently used for palmets, lampshades, cushions, to weight corners of work-bags, panels, and for other ornamental furnishing and dress

purposes. There are several kinds, made of silk thread of any colour, of fine braid or ribbon, of gold or silver thread, of wool, beads, or leather. They are used as an ornamental finish to girdles for dressing gowns, and sometimes to edge scarves. Another use for a silk tassel is for a necklet. The necklet itself is frequently a silken cord, upon which is suspended a large, decorated bead or amulet, from the base of which hangs the tassel, of the same colour as the cord.

To make a woollen tassel, such as might be used to finish the ends of a girdle for a dressing gown, take a small piece of card, as wide as the required length of the tassel, and bind the wool round it several times, the number of threads in the tassel depending entirely upon individual taste. These strands of wool are tied tightly together at one edge of the card and are cut at the other, all that remains to be done being to hold the ends in one hand, and twist a strand of wool several times round just below the point where it was tied. See Curtain, Cushion; Fringe, Pompon.

TATTING: In Needlework. An old-fashioned kind of fancywork, tating can be worked in crochet cotton or in pure silk, a tating shuttle and a crochet hook or bone pin being required. The shuttles are made of bone, tortoiseshell, ivory, and ebony inlaid with mother-of-pearl, and have a block in the centre, pierced with a hole, through which the cotton is passed.

To fill the shuttle, thread the end of the cotton through the hole, tie it, and then pass it through the ends of the shuttle round and round the block until it is level with the ends of the shuttle. The cotton should then be cut off, about 1 yard of it being left to hang loose. Workers should note that the crochet needle or bone pin is needed when joining the loops.

In learning the stitch, the chief thing to remember is that the thread over the hand is to be kept loose, while the thread from the shuttle is drawn tightly. The work resembles the buttonhole-stitch used in making a loop for buttons, the thread from the shuttle corresponding with the loops of the button loop, the thread over the hand corresponding with the buttonhole-stitch worked upon them. Take the end of the thread in the left hand between the thumb and the finger, and pass it over the fingers of the left hand, then bring it back to the thumb and finger again, so that there is a ring of thread round the fingers.

With the shuttle in the right hand, throw the thread from the shuttle round the back of the left hand and pass the shuttle under the thread round the fingers, then draw it back over that thread and pull it out tightly, letting the loop over the fingers become slack.

This forms a loop on the shuttle string tightened by expanding the fingers.

The first half of the stitch is now completed. In making the second half, do not throw the shuttle thread round the left hand, as previously, but simply pass the shuttle over the loop round the fingers and draw it back under it, thus reversing the process of the first half. Make quite certain after each stitch that the shuttle thread will draw, for if it will not an error has been made, and the stitch must be unpicked. When twelve stitches have been made, draw up the shuttle thread until the stitches form a ring, the first and last stitch meeting. Leave about $\frac{1}{4}$ in. of thread between this and the next ring, which should be worked in the same way.

These rings are joined together by the pivot stitch, which is made by leaving a short length of cotton between the stitches, which, when the ring is joined up, forms a little loop. In a large piece of work the rings are sometimes sewn together, but ordinarily these loops provide the best means of joining them. Begin by making 4 stitches, and leave a small length of cotton between these and the next stitch. Some practice is necessary in picking the right length, for all loops must be of the same size. Then work 4 stitches and another pivot, 4 more stitches and a pivot, finishing with 4 stitches, and then drawing them up into a ring. There is now a ring with 3 pivots, and the following ring must be joined to the right hand pivot.

Begin the next ring in the same way, and when 4 stitches are made insert the crochet needle in the pivot of the last ring and draw the cotton which is round the fingers partly through the pivot; pass the shuttle through this loop, and then pull the finger thread tight. Proceed with the same number of stitches and pivots as in the last ring.

TAXES. In Great Britain there are levies on the incomes and purchasing powers of citizens to meet the government's costs in maintaining state services. Taxes, which are levied and collected by the government, are distinct from rates, which are levied and collected by local authorities. Taxes are divided into direct and indirect. Direct taxation is a levy on income and property values (*see* Income Tax), whereas indirect taxation is a levy on purchasing power after an income has been taxed, the tax being added to the cost of the article and paid at the time of purchase. Examples of indirect taxes are the excise duties on tobacco and intoxicating liquors, motor vehicle and petrol taxes, etc. In Great Britain during and after the 1939-45 war an indirect tax called purchase (q.v.) tax was imposed not only to raise exchequer income but also to reduce public expenditure on non-essential goods. See also Licence.

TAXIDERMISTRY FOR THE AMATEUR

A Simple Example Described Step by Step

Here are detailed instructions by means of which the nature lover can preserve and mount in natural positions not only birds and small animals, but reptiles and fish.

The work of the taxidermist, which consists in preserving the dead bodies of animals, in their natural forms, is well within the scope of any careful amateur. The following tools and materials are required: A pocket knife, a pair of small scissors, round-nose pliers, flat cutting pliers, 3 cornered file, iron wire of various sizes, plain and coloured glass eyes, thread and fine string, tow and cotton wool, clay, pins, preservative soap and powder, camphor. Glass eyes and preserving soaps and powders can be purchased at a taxidermist's or naturalist's shop.

The preservatives used are generally highly poisonous.

Skinning a Squirrel. Supposing that the animal to be preserved is a squirrel, the first step is to place it as nearly as possible in the attitude in which it is intended to remain

when stuffed, Fig. 1. Carefully study the formation and contours of the body, and note down on paper any little details likely to be of use in obtaining a natural appearance. The squirrel is now placed on a board large enough to spread the limbs. The lower portion of the limbs should be tied to the board, holes being bored through the board at convenient places. The specimen is then placed in a good light and at a suitable height, and the skin opened with the large blade of the knife. The cut should be commenced about the middle of the breast and continued down into the lower part of the body, the separated skin being opened out and secured by bent pins attached by pieces of string to a nail.

Proceed to skin the body by first working out the hind legs, cutting the leg bones, under



Taxidermy. Fig. 1. A squirrel that has been stuffed in a natural attitude according to the instructions given in this article.

the skin, at the large joints. Use the cutting pliers to sever the joints. Carefully strip the skin off the lower part of the body, at back and front until the tail is reached, the flesh and small bones of which are pulled out from the skin. The operator is now able to proceed with the removal of the skin from the back and breast until the forelegs are reached, the bones of which are cut away like those of the hind legs.

The neck and head are skinned down to the inner edges of the mouth and nose, and great care must be taken to avoid cutting the outer portions of the ears, eyelids, nose, mouth, and lips. After severing the skinned body from the head, remove all the flesh, the brain, and the eyes from the skull, which will now be attached to the skin by the inner edges of the mouth and must be handled carefully. Clean away all the flesh from the bones of the legs, and the skin is then ready for treatment.

Turn the skin completely inside out and scrape off any adhering flesh or other matter, and then apply a good coating of preservative soap, working it well in with a small brush. The skin is now turned fur side out again and hung up for 48 hours to dry and let the soap act. At intervals during the drying period the skin should be gently stretched and worked to keep it soft and supple, and at the end of the 48 hours it should be turned inside out and scraped clean with a blunt knife. Then a liberal application of the preserving powder should be thoroughly rubbed in.

Modelling the Head. The interior of the skull, as at Fig. 2, should be filled with tow, saturated in a solution of camphor dissolved in a little pure turpentine. The first step in stuff-

ing is to bring the head to shape and this is done by placing clay and tow on those parts of the skull from which the flesh was removed and modelling them to the required form. The skull is then replaced in the skin of the head, the glass eyes having been set in the eye holes. The clay should be used as dry as possible and allowed to harden before placing the skull finally in the skin. Parts that are too low can be raised by pressing in a small quantity of cotton wool under the skin of the head and directing it to the required place by means of a piece of blunted brass wire.

A strong iron wire, about 10 in. long, is pointed at one end and bent to the shape of the backbone. It is then tightly bound round with tow to the shape of a long narrow body, and placed in the interior of the skin, the pointed end being inserted well into the skull. A pointed wire, about 8 in. long, is thrust through the sole of each hind foot, and forced well into the tow body and the ends bent over. After the wires have been inserted, the ends should project for nearly 2 in. from the sole of the feet.

The leg wires and bones should be clothed with tow and clay and modelled to shape after the wires are in position. The forelegs are wired by forcing a 6 in. pointed wire through the underside of the claws of each paw, the ends being thrust into the body and clenched over. Bend the forelegs to the desired position and bring to shape with tow and clay as already described. A thin iron wire pointed at both ends, and about 12 in. long, is passed through the cartilage of the tail, inserting the wire at the root and carefully pushing it up to the tip. Secure the lower end of the wire by pushing it into the body and bending over.

The body and legs are now bent into their permanent positions, and modelled to shape by the addition of more tow or cotton wool until the natural contours are obtained. Powdered camphor should be mixed with the

stuffing material. The opening in the skin is lastly neatly sewn up with fine thread, and a piece of wood about 5 in. by 4 in. by $\frac{1}{4}$ in. obtained for a stand.

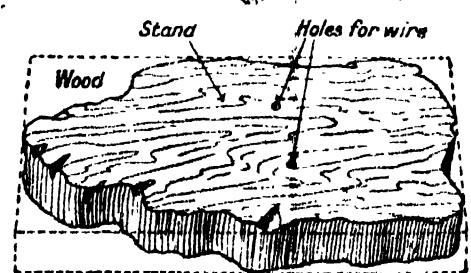
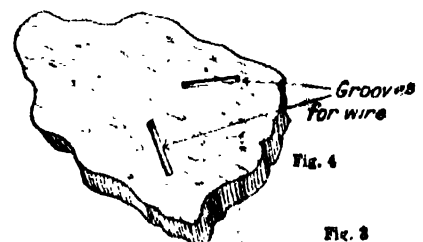
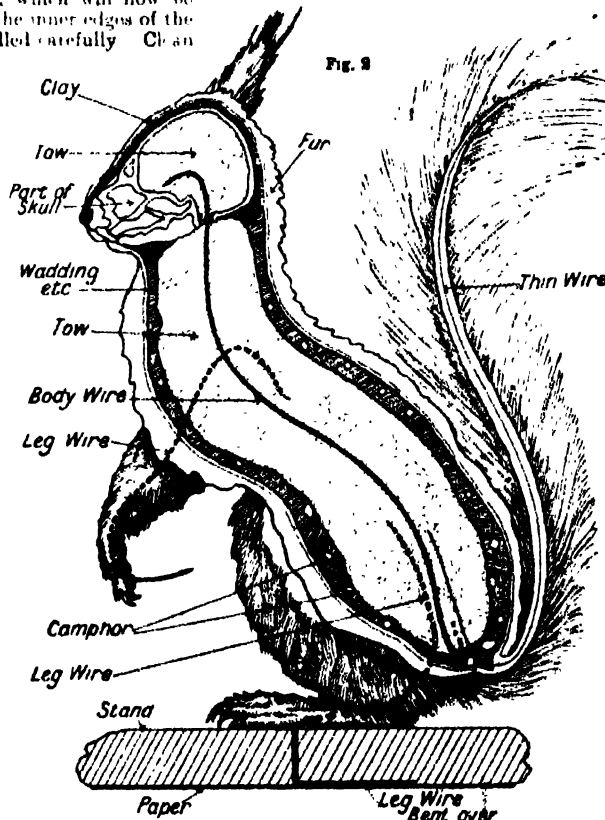
Mounting the Specimen. The stand (Fig. 3) will look better if its sides are irregular, and they can easily be made so by indenting and rounding them with a sharp knife. Bore two small holes for the wires of the feet through the surface of the stand, turn over, and cut a narrow groove, radiating like an arm of the letter Y, from each hole, as at Fig. 4. Apply a coating of hot glue to the top surface and sides of the stand, and dust on fine sand until all the glued portions are thinly covered, when it should be set aside to dry.

The leg wires are passed through the holes in the surface of the stand, and allowed to project for about 1 in. after which they are bent over at right angles into the grooves and clenched into the wood, as shown in Fig. 2. A piece of thin brown paper is cut to the shape of the bottom of the stand and glued thereto to give a neat finish. The tail is bent to a natural curve and a nut placed between the claws of the forefeet, holding it in position by the projecting ends of the wires.

The fur is finally cleaned by gently rubbing it with wadding soaked in benzol, afterwards dusting on fine plaster of Paris, which, when dry is beaten out with a bunch of feathers. The cleaning is best done out of doors, as the benzol is highly inflammable. Use a fine tooth comb and brush to bring the hairs of the fur into their positions and folds, and arrange the tufts on the ears and the whiskers with a fine wire. The specimen is now complete, and should invariably be kept in a dry place.

Fish and Reptiles. The instructions given above are equally applicable to birds, fishes, and the larger reptiles. With patience and perseverance and the aid of a good text book on taxidermy, large specimens also may be attempted.

A considerable amount of artistic skill and particularly neat workman-ship is required in mounting birds, especially when it is desired to show them with open wings. It is worth while spending time and care on the wiring of the legs. The wire for this part of the work should be of a stouter gauge than that used for the body—it should be long enough to lock into the body and be sharpened to an acute point at the end. There is only one position in the scaly part of the leg down which the wire will pass freely without damaging the skin, and that is on the inside of the member on the actual sole of the foot, immediately at the base of the hind toe. The actual position



Taxidermy. Fig. 2. Sectional diagram showing arrangement of wires and stuffing. Fig. 3. Diagram of irregularly shaped stand, showing position of holes for wire attached to the legs. Fig. 4. Underside of stand showing grooves cut from each hole for wire.

of the legs should be decided on and the bird mounted on a suitable base, such, for instance, as a piece of thoroughly dried peat or a piece of virgin cork.

The general shape of the bird is now adjusted, and if the wings are closed the work is simple, two short pointed wires being required for each wing. For open wings a long wire should be passed right down through the interior of the wing, into the body and then locked in position. For small birds the single wire will generally be sufficient, but with large specimens the principal wire must be stout, and a second wire passed between the wing feathers close to the base. When the final shaping has been effected, the plumage should be worked into position, for it is very little use to attempt it before. The most suitable tools for this work are a pair of fine tweezers and a needle mounted in a convenient wooden handle. All the feathers should be carefully looked over, and in places where shot holes have disarranged them it is often advisable to pull them out, stroke them flat, and replace them with a touch of paste at their bases.

TAXODIUM. This is the botanical name of a beautiful conifer, the deciduous or leaf losing cypress, *Taxodium distichum*. It is a graceful tree with light green leaves which become attractively tinted before they fall in autumn. It will attain large dimensions in the course of time and thrives best in moist soil; it is a good waterside tree.

TAZZA. The silver drinking vessel called by this name consists of a silver bowl, in shape not unlike that of a champagne glass, supported by a short stem and a small foot. Originally made to hold drink, they were afterwards used for fruit and cakes. The word is used sometimes for glass and china dishes of this shape, and also for those made in other metals. Examples in antique silver are rare and fetch high prices. See Silver.

TEA: The Meal. As a general rule, in households where dinner is served in the evening, afternoon tea is a very slight meal. In households where the children's dinner is taken at mid-day, tea is usually quite substantial, combining both tea and supper. Bread and butter, jam and simple cakes or

buns comprise the usual nursery menu, with either weak tea or milk and sometimes with fruit in season.

For high tea, which is a rather more solid meal in place of supper for the family, the



Tazza, with lid, in wrought iron, inlaid with silver in a floral design. Modern Belgian work

table is laid much as it is for breakfast, with knives and forks, as well as the accessories of tea proper, and very often ham or meat of another kind is offered. Eggs, boiled or cooked in other ways, grilled tomatoes, bacon and kidneys, sardines on toast, special salads, or sometimes a large meat pie or a fish dish, are served, while cakes and jam follow. See Afternoon Tea Table; Breakfast; Picnic; Sandwich; Service Wagon; Tray.

TEA: ITS QUALITIES AND BLENDS

With Hints on the Best Methods of Infusion

Other entries that bear on the matter include: Breakfast; China Tea; Diet; Pekoe; Souchong. See also Kettle; Tea Caddy; Tea Cossy; Teapot; Urn, etc.

Tea owes the properties which have made it so popular a beverage to a volatile oil and to theine, an alkaloid which has a gently stimulating effect on the nervous system. It also contains a proportion of tannin, or tannic acid, which is liable to cause indigestion when tea is not properly made or is allowed to stand too long so that it becomes overdrawn. The proportion of tannic acid varies in different kinds of tea; it is usually from 10 to 12 per cent. The proportion of the volatile oil is about $\frac{1}{2}$ per cent., and of theine 2 to 4 per cent. A cup of fairly strong tea contains 1 gr. of theine and 2 gr. of tannic acid.

Of the tea imported into Great Britain nearly 90 per cent is produced within the Commonwealth, chiefly in India, Pakistan, and Ceylon. The balance is grown mostly in China. China tea contains less tannin than the Indian product. On the other hand, there is a larger proportion of theine in Ceylon tea than is usually found in the Chinese varieties.

There are two classes of tea, namely, green and black, with many varieties of each. The difference lies chiefly in the mode of preparation, green tea being rolled and dried, while black tea is also allowed to ferment. The best green tea comes from China.

Of black China tea the chief kinds are Pekoe, Souchong, and Congou, which are

practically three qualities of the leaf. Pekoe consists of the bud and the first leaf; it is the first-fruit of the plant, and is named after the young shoots, the word Pekoe signifying white down. Souchong is obtained from the next leaves after Pekoe, and Congou is the third selection. Among the varieties there are flowery and orange Pekoes, and others which are largely employed in blending.

Practically all kinds of tea are a blend of several different sorts, the reason being that it is very rare indeed to find the requisites of flavour, strength, and colour combined in any single kind. Some varieties are highly fragrant, being scented with flower petals, notably jasmine. Bohoa, a name once applied indiscriminately to all teas, and sometimes used to-day for a poorer late-grown leaf is a variety grown in Fukien prov., China, which is also noted for red leaf Congou.

Buying and Storing. Tea is sold in packets weighing from $\frac{1}{2}$ lb. upward. It should be kept in a dry place and protected from the air. This is particularly necessary where tea is kept in a store or pantry in the neighbourhood of other commodities, especially fruit or spices, as they may communicate some of their flavour to the tea, the dried leaves of which are very susceptible to the surrounding atmosphere. For this reason tea should be kept in

a box or metal canister with a close-fitting lid, or else in a tea caddy.

As a rule a chest of tea contains 84 lb. and a half chest 50 lb. Indian and Ceylon chests contain about 100 lb. These chests are furnished with a protective lining of sheet lead.

In buying tea, the housewife has in normal times a wide range to choose from. Generally speaking, the Indian varieties are stronger than the Chinese, but black teas of all kinds are obtainable, and the purchaser should be guided by her own particular taste. Black blended teas are the most numerous. Most firms sell a household blend of medium strength and good flavour for ordinary domestic use. A fuller and richer flavour is provided by mixtures of Ceylon and Assam.

The addition of a small quantity of China tea in some blends makes for a more pungent-tasting beverage, and occasionally a flavouring of Oolong is added. Unblended Indian teas, of fine and expensive quality have a delicate and slightly pungent taste. Darjeeling is fragrant and full flavoured.

How to Make. In making tea many people think it is best for the flavour of the beverage to use an earthenware teapot. The water used should be quite fresh, that is to say, it must not have been boiled previously and reheated, nor have been standing some time. The kettle should be emptied and filled fresh from the tap every time that tea is to be made. Soft water is always best for the purpose, where the supply to the house is a hard water, a very little carbonate of soda may be put into the teapot along with the tea, care being taken not to put in more than a pinch, otherwise the tea may have an unpleasant flavour.

It is essential that the water should be actually boiling. A second point to note is that the teapot should be heated. A little water from the kettle is poured into the teapot, and the latter can then be allowed to stand until the kettle boils, when the teapot can be emptied and the tea dropped into it.

An old rule as to the quantity of tea required is to allow one teaspoonful for each person and one for the pot. One good teaspoonful, however, should be enough to make two cups of tea easily, with some teas a teaspoonful will make three cups. Much depends on the quality of the tea.

After the tea has been put in, the pot should be filled up as soon as the kettle boils, pouring the water slowly over the tea leaves. The most usual method is to fill the teapot half full, but some people fill it three quarters full.

The filled teapot should then be allowed to stand for 3 or 4 min. so that the tea is properly infused. This is much more satisfactory than to stir the contents of the pot with a spoon, as is often done to save time. China teas require to be thoroughly infused, and some may be allowed to stand for 8 or 10 min. without any risk of deterioration. Some tea drinkers allow the tea to stand for 2 or 3 min. and then pour it into a second teapot which has previously been heated. In this way the infused liquid is obtained without the leaves, and there is no risk of tannic acid spoiling the tea if it should be left standing.

Another method of making tea is by putting it into a teaspoon infuser. Many persons, especially those who suffer from indigestion, prefer to have their tea made in this way, because it produces an absolutely fresh cup with no possible excess of tannin.

Tea cannot be said to have a food value, except when it is taken in conjunction with milk and sugar. Tastes differ considerably in this respect. Some persons enjoy their cup of tea with milk alone, some only take sugar, and there are others who take neither, while some choose lemon in preference. Even when reinforced with milk and sugar, tea is inferior in nutritive value to cocoa, and also to coffee.

made half with milk, but neither coffee nor cocoa possesses the refreshing properties of tea.

From the medical standpoint, the active principle of tea, clears the brain, stimulates mental action, and removes feelings of fatigue and drowsiness. The best times to take tea are at breakfast and in the afternoon: for most people twice a day ought to be sufficient. It is well not to give tea to young children, or at least not more than a tablespoonful in a cup of milk.

People who are in the habit of drinking too much tea, or taking it too strong, may suffer sooner or later from indigestion, palpitation, loss of appetite, sleeplessness, depression, constipation, or nervousness. The remedy is to stop drinking tea till the symptoms disappear.

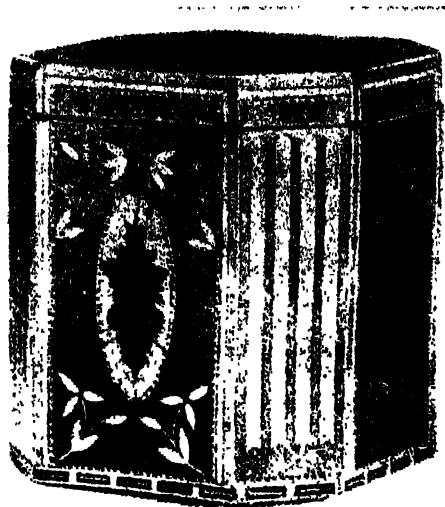
TEA BASKET. A basket made to carry materials for a picnic tea is very similar to a lunch basket, being of wicker, provided with a lid, and straps for security and as a means of carrying it. Cases are more used than baskets. The fittings for either consist of cups and saucers, plates and tea knives for two, four, or six people, a larger knife, and several cake plates, a bottle for milk, and tins for holding sandwiches and cakes. They also include either a vacuum flask or a spirit kettle and stove, teapot and tea caddy. See Picnic.

TEA CADDY. The earliest caddies were of Chinese porcelain shaped like a ginger jar. These were made in great variety by the English potters, a common type being one of blue and white chinaware. They are often in pairs, one for green and one for black tea.

Soon they were made in silver, brass, pewter, and tortoiseshell, and in the 18th century fine silver pieces were produced. Some of these are chased with pastoral figures, flowers and scrolls. They had slip in, pull off, or hinged lids. Some are shaped like a vase, while others are oval, silver head edging being found on some of the latter type. Sheffield plate caddies were sometimes hexagon in shape, but the more usual type to be picked up to-day are oblong or oval with beaded or gadroon borders. The hall marks should be on the side or bottom.

The wooden tea caddy was evolved from the metal one. It became usual to encase two of them in a wooden box, and in the 18th century wooden caddies were largely made. These usually contained three receptacles and were shaped somewhat like a small chest. At either end was a lidbed well, one for green and the other for black tea, and in the centre was a receptacle for sugar. The inner woods were used, chiefly mahogany, rosewood, and satinwood. Some were mounted on brass, and many were beautifully inlaid. Knobs of ivory, ebony, and silver are found on them. Specimens of the older caddies enclosed in a box are sometimes met with. An example is a set of three silver ones fitted in a rosewood case. Shagreen was occasionally used for the case.

Tea caddies were made by Chippenhale and Hepplewhite. Mahogany was the wood chiefly used by both. Chippenhale made some of his caddies rather in the shape of caskets with richly carved lids and feet, the claw



Tea Caddy of hardwood and satinwood, with marquetry of satin and other woods

By permission of the Director, Victoria and Albert Museum, Kensington

and ball being much used by him. The outlines of Hepplewhite's caddies were straighter than those of Chippenhale. Instead of feet he often fitted a plinth to them, and while mahogany was frequently used, delicate veneers were much favoured.

An example of late 18th-century workmanship is an oval box of painted wood, on which is represented flowers, crests, and allegorical scenes, vividly coloured. Some of this type are painted with festoons in the Adam style or medallions revealing Grecian figures. Caddies

were also made of papier mâché, usually painted black, and decorated in the Chinese manner or with mother-of-pearl, etc.

In addition to the above, which may be regarded as the chief styles, another type of caddy was introduced early in the 19th century, the decoration of which consisted of rolled paper filigree work. This consisted of a box, usually hexagonal in shape, which had faces slightly recessed. In the recesses were fitted many coils of paper cut in narrow strips, each placed on edge and arranged so as to form an elaborate pattern consisting of scrolls, leaves, festoons, and geometrical figures. The inner edges were glued to the wood, the coils were twisted so that rough handling could hardly move them out of shape, and the surface was protected with glass. Sometimes, the parchment paper scrolls were left ivory colour, sometimes gilded. The effect was that of fine carved ivory, or, when the strips were gilded, of metal filigree, while some of the tinted work was like Indian lacquered wood carving.

For use with caddies a special kind of spoon was designed in Sheffield plate, silver and other metals.

TEA CAKE. Tea cakes can easily be made from 1 lb. flour, $\frac{1}{2}$ oz. solid yeast, 2 oz. margarine, a flat teaspoonful of castor sugar, an egg, a pinch of salt, and milk and water to mix. Sieve the flour and salt into a basin, rub the fat into them until the mixture resembles fine breadcrumbs, and make a well in centre. Put the yeast into a small, warmed basin,

add the sugar, and mix them together until they form a liquid. Then pour in $\frac{1}{2}$ pint warmed milk and water, mixed in equal quantities, strain the whole into the flour, etc., and mix all to a stiff paste. Turn the dough on to a floured board, knead it until it is smooth and pliable, and then divide it into two or three portions, shaping each into a round. Put these on to a greased baking sheet, cover them with a cloth and leave them in a warm place for about 50 min., or until they have risen to twice their size.

Bake the cakes in a hot oven for 20 min., and just before they are ready to be taken out brush them over with a mixture of milk and sugar. Leave them for a few minutes so that the glaze may dry. The latter can be made from $\frac{1}{2}$ gill milk and 1 dessertspoonful castor sugar. For currant tea cakes add 1 oz. picked and cleaned currants to the above.

Smaller tea cakes made with baking powder instead of yeast can be prepared from $\frac{1}{2}$ lb. flour, 1 oz. margarine, 1 teaspoonful baking powder, half an egg, and about a gill of milk. Sieve the flour with the baking powder into a basin and rub the margarine into them. Beat up the egg and add it to the flour, etc., pouring in also sufficient milk to mix the whole to a soft but not sticky con-



Tea Cakes. Small cakes which may be served cold or cut open and toasted before buttering

sistency. Roll out the mixture on a floured board until it is about $\frac{1}{4}$ in. thick, then cut it into small rounds, brush these over with milk, and bake them on a greased baking sheet for 10-15 min.

Tea cakes may be buttered and served cold, but more often they are sliced in half, toasted and buttered, put together again, and then cut in the same way as an ordinary cake. See Crumpet; Girdle Cake; Scone.

TEA CLOTH. The phrase tea cloth has two distinct meanings. In one it refers to the cloth laid on the afternoon tea table, and in the other to the cloth, similar to a glass cloth, which is used for drying the tea things after they have been washed up. Ideas for embroidering and decorating afternoon tea cloths are given in the articles on Draw Thread Work, Embroidery and Pattern Printing.

TEA COSIES CONVENTIONAL AND QUAIN

Directions for Making These Table Accessories in Various Fabrics

The reader is referred to the articles on Patch Work for instructions in covering a tea cosy in that material. See also Appliqué Work, Embroidery, Laid Work, Leather Work; Patchwork, Quilt, Ribbon Work, Tapestry Needlework, Woolwork

A tea cosy in common with every other well thought out accessory should be chosen with due regard to its surroundings both in style and colour. As a rule a conventional shape is best for the dainty cosy on an afternoon tea table spread with an embroidered or lace and linen cloth, and also for a cosy to accompany a dining-room breakfast service of handsome and formal design. Conventional shapes are used in smaller sizes for the cosies which form part of a set for the breakfast tray, with egg cosy, and tray cloth to match. Quaint shapes are seen in the cottage designs worked in various materials and in developments of the same idea, such as "The Old Curiosity Shop," Noah's Ark and house

boat notions. These are particularly suitable in company with cottage breakfast ware for nursery or dining room, or for garden tea tables. There are also hen, duck and a few other animal shapes designed to cover the nursery tea pot.

Making the Padded Lining. Although padded interlinings can be bought inexpensively in several sizes at art needlework shops, some people prefer to make their own. It is really simpler and wiser to have an independent lining for most cosies of conventional shape, and to slip the cover over it when the latter is completed. In the case of suede or a silk or satin cover which has been hand-painted, stencilled, or very delicately embroidered, it

is sometimes desirable to have the lining renewed, or cleaned separately. In the case of a washable linen cover of pale colour, this will require laundering separately. When the cover is of white linen decorated with drawn-thread work or lace motifs and insertions, the lining which will show through should be of a colour to suit the table ware so that the effect of the needle work is enhanced. A separate lining can be attached to the cover by a few stitches to keep it in place.

Cosies vary in size from those designed for individual teapots to the large covers for family breakfast teapots. A very small cosy cut in conventional semicircular fashion measures about 9 in. across the bottom and is 7 in. high at the centre of the curve. A medium size is 14 in. by 8 in., while a larger one has a height of 10 in. and a width of 16 in. Whatever the size required to fit the outer cover, allow 1 in. all round for turnings when cutting the lining fabric. The wadding for interlining must be cut exactly to the size of the cosy when finished and no turnings allowed. Satteen is a useful material for linings, but for better cosies, silk and crepe-de-Chine are used for the inside of the lining next the teapot, while a cotton material serves for the outer lining next the cover, unless this happens to be decorated with openwork.

Cut four semicircles of the lining fabric and two of wadding (some workers use this in double thickness), sew the two semicircles for the outside of the lining pad together face to face, stretching firmly all round except at the bottom. Turn them inside out and then stitch the two inner lining pieces together in the same way, but do not turn. The two pieces of wadding are now sewn together round the top and sides with long tacking stitches. If the edges of the wadding are overcast they will not fray out. Slip the wadding inside the outer lining, catch them together with a few tacking stitches to hold the wadding in place, and then push, smooth and stitch the inner lining into position. The bottom edges should now be neatly sewn together all round to complete the lining pad. An inner lining of silk or satteen to match the cosy cover is made and adjusted to a wadded interlining when the latter is bought covered in white cotton material.

Afternoon Tea Cosies. Whether a cosy cover is a separate affair or at one with the padded lining, any embroidery or painting is done before the fabric is made up. Linen cosies are

particularly dainty when of pale colours worked in stranded cottons either with garlands of flowers forming a border, or with a single motif placed on either side. Cross-stitch is another favourite method of trimming and beautiful covers are made in drawn thread work, broderie Anglaise and Richelieu work (q.v.). The most successful results are obtained by having a tray cloth or table cloth to match this style of cosy. Suitable transfers and designs are obtainable in great variety.

Cloth cosies are trimmed with laid work in gold or silver thread with ribbon work, or with conventional appliqué designs. Needle tapestry in wool or silk may be employed to cover a whole canvas foundation or for a motif to be applied to a cloth, silk or satin tea cosy. Decorative patchwork makes attractive cosies in silk, velvet or serge. For these fabrics a good finishing touch is a cord sewn along the bottom and outside edges. This should be done with silk of the same colour as the cord and after the cover has been joined. Take up a tiny piece of the fabric and a few threads of the cord and pull them together, then run the needle under the covering material for the longer stitches and take small stitches in the cord. The ends of this must be neatly finished off. To form a handle a loop of the cord should be twisted and left in the middle of the top. Tinsel cords are often used when silver or gold thread is introduced into the embroidery. Thonging is sometimes employed as a finish when suede is the material of the cover. (See Leather Work.)

Nothing could be more appropriate for a cosy than fancy quilting. The example of this work illustrated in Fig. 1 was carried out in rose-coloured crepe-de-Chine, quilted by hand with back-stitching in silk thread to match. Instructions for fancy-quilting will be found in page 1030. Italian quilting can be equally well used to decorate a cosy for the drawing-room tea table.

As quilting is done on fabric with an interlining, the inside lining of the cosy made of the same material as that quilted is usually attached to the outer cover, an extra layer of wadding being inserted between the two. Such cosies are prettiest in delicate colours and require to be dry-cleaned. The semicircular edges of the one illustrated are finished with a self-piping and strap handle. Sometimes the piping is twisted into a looped bow to form



Fig. 2. Cottage cosy made of felt. The lattice windows, rose trees and flower border are worked in bright coloured wools and easy stitches

the handle at the top. It is very interesting to work out quilting patterns for oneself with the aid of an original drawing or suitable embroidery transfer for the centres of the front and back of the cosy, drawing the border for this, diagonal lines and outer border for quilting, directly in pencil on to the fabric after taking a few measurements for correct spacing.

Cottage Shapes. Felt, raffia cloth, linen, crash, blanket cloth and embroidery canvas are all used as foundation materials for the building of cottage cosies. It is not difficult to evolve one's own patterns out of brown paper, cutting the roof portion separately, a back and a front piece of the same size, and two side pieces. The chimney which forms the handle is a straight piece doubled over and sewn on to the middle of the roof.

The cosy illustrated in Fig. 2 is made of felt. The thatched roof is of brown, the chimney of brick red, the walls of fawn and the door of dark green felt. The height including the roof should be about 10 in. when flat. A piece of brown felt measuring about 9 in. deep by 11 in. wide would be sufficient to form the roof, back and front when doubled, and the front and back walls of the cosy would be each 7 in. deep (to allow for joining to the roof), and 10 in. wide. The roof projects slightly at either side. The sides are about 4½ in. wide and 10 in. high, being cut up to a point between the back and front of the roof. The door is a scrap of green (or other coloured) felt buttonholed to the wall piece. The design of windows and flower bed, etc., can easily be drawn on the felt with a coloured crayon.

Bright coloured wools are used for the embroidery. The windows are done in chain stitch, the woodwork to match the door and the lattice in dark grey. The rose tree is in stem stitch, brown for the stalk, single stitches in green for the leaves and a French knot for the centres of the pink roses. The groups of smaller flowers are worked with single upright stitches, small ones crossing these in green to form the leaves and stems and the flower heads put in with lazy daisy stitch, buttonhole rings and French knots for the buds. Any other stitches can be introduced which the worker fancies, and the flower embroidery can be continued at the sides



Tea Cosy. Fig. 1. Cosy of rose pink crepe-de-Chine suitable to accompany a dainty tea service. The design is quilted by hand



Tea Cosy. Fig. 3. Plush duck cosy for the nursery teapot. Scraps of the plush left over can be made into ducklings to keep eggs warm.

in one group and a few brown stitches to represent the earth of the bed. The back can correspond with the front, but leaving out the door and the nose tree. The cottage walls when embroidered are tacked together and made up by firmly buttonholing the edges with wool to match the felt. Begin at the bottom so that all the edges are even at the base. Lay the roof in place over the four sides of the cottage, and stitch it down with long running stitches. It is a good plan to buttonhole the points of the side walls and catch the roof through to the buttonhole stitches. Buttonhole the little piece of brick red felt for the chimney in the same colour, and attach it in the position shown.

Cottage cosies are obtainable, shaped in canvas, and ready to be embroidered in tapestry needlework. Transfers can also be bought suitable for linen or rather cloth covers. Details vary for roofs, windows and garden effects, but in the main the shapes are much the same.

Nursery Tea Cosies. Linen cosies with applied or cross-stitch designs of animals or figures from nursery rhymes are more commonplace than the plush duck tea cosy which is illustrated in Fig. 3, with the duckling as a miniature egg cosy. For the tea cosy $\frac{1}{2}$ yd. of 36-in. wide woolly plush is allowed, the same amount of satin for lining, a sheet of wadding for interlining, two black shoe buttons for eyes, and a small piece of orange cloth or felt for the beak.

The cosy is cut in duplicate, each side in one piece, shaping it with a smaller portion for the head, slightly waisting the shape below this, and then widening out to form the semicircular lower portion. The wings are cut out in 4 pieces roughly diamond shaped and the beak is simply 4 semicircular pieces, 2 for the upper part and 2 for the lower. The lining is cut in duplicate semicircular pieces.

Join the two halves of the plush covering with the right sides facing and stuff the head part well with cotton wool. Pad and line the cosy. Join up the two pieces of the wing, leaving an opening at the base so that the work can be turned right side out. Sew up the opening and attach in position on cosy. Make the other wing in the same way. Join up the two pieces for the upper beak, turn, join up the other two pieces, and sew in position. Sew in the buttons for the eyes.

TEAK: The Wood. This is a heavy hardwood, dark brown in colour, sometimes with a greenish shade. Like oak and some other woods, it darkens with exposure and age. It is oily, does not suffer by contact with iron, and is durable under water. Its grain is straight and rather coarse with a dull surface. When freshly cut it has a peculiar smell, something like leather. Though not very difficult to work, it contains a phosphate of lime which soon dulls the edges of cutting tools. When well seasoned it does not crack.

Teak is largely used for furniture in India, its native place, but only to a small extent in Great Britain, its dull appearance and its weight being against it. It is used occasionally for floors, stair treads, window and door sills, and similar purposes. See Colour Plate facing p. 1325.

TEAL. Roasting is the usual method of cooking this water-fowl, the bird being trussed like an ordinary duck, basted well while cooking so that the flesh may not be too dry, and garnished with watercress and cut lemon. Any of the sauces served with wild duck and orange salad may accompany teal. About half an hour is required for roasting. See Duck; Salad.

TEA PLANT. So far as Great Britain is concerned, the tea plant may be described as a greenhouse, evergreen flowering shrub of purely decorative value, with dark, shiny, oblong, green leaves, and white flowers during autumn and winter. It should be potted up early in spring in a mixture of equal parts of peat and loam and freely watered. As it requires a mean temperature of only 55°, the tea plant may be safely placed out of doors in a shady position during the summer. It is propagated by seeds sown in springtime, or by cuttings, or layers in autumn. Plenty of water and liberal syringing is desirable during the summer months.

TEAPOT. Teapots may be divided into two classes, those made of china or earthenware and those made of metal. The former are often made to match a tea service, and are found in almost all wares from the cheapest to the most expensive. They are also made and sold as single articles. The simple teapot of brown earthenware is considered by many persons to possess unrivalled powers of drawing the best from the tea. There is not a great deal of variety in the shape. Some are round and others oval, and all makes in the first class are fitted with a loose lid.

The best metal teapots are of silver, but they are also made of Sheffield plate, electroplate, aluminum, and enamel ware. Often they are made with sugar basin and cream jug to match. In the better specimens insulating disks are placed in the handles to prevent them from becoming too hot. Alternatively the handle is made of ebony, ivory, or wood. With the exception of enamelled ware, in which teapots are modelled on the same lines as earthenware ones, metal teapots have hinged lids. Silver teapots are marked on the side or on the bottom and the lid; if it is contemporary it should be marked with the same initials as the body and with the lion passant. In buying a teapot of any kind



Electric Teapot. The tea leaves are placed in a tea ball or infuser and then let down into the boiling water. When the tea is made the infuser is lifted out of the water by means of a chain.

particular attention should be paid to the spout. In some cases the set of this prevents proper pouring of the tea.

Silver Teapots. The silver teapot dates from the end of the 17th century, earlier ones having been of oriental porcelain. The earliest are chiefly of the Queen Anne pattern, and a few of them have a hinged lid over the spout. This style was continued into the 18th century.

There is a good deal of variety in the early teapots, as their patterns changed considerably during the 18th century. In its early years octagonal and hexagonal pieces were the most usual, but soon the cylindrical shape became the fashion. Later the teapot became somewhat pear shaped, but with the protuberance in the upper, not in the lower part. Elaborate decorations were soon introduced, some being in the graceful style associated with the brothers Adam. Among these decorations are festoons and medallions,



Teapot. Two Georgian silver teapots, one of them standing upon ball legs, and both with ebony handles. Courtesy of Chippell & Mantell.

as well as repoussé work. Two typical examples of late Georgian teapots are illustrated. That on the left dates from 1787 and has a fine thread edge and an engraved shield. Teapots of this shape often were made with stands to match on four feet. The teapot shown on the right dates from 1827, and has the four ball feet which makers began to put on at the beginning of the 19th century to obviate the need of the separate stand.

About the end of the 18th century some beautiful teapots were made in Sheffield plate. Existing examples, which have been largely reproduced, are very refined, both in shape and in decoration. In these subtle curves, plain surfaces and handles of flowing scrolls are skilfully combined, while the adornment takes the form of pierced ribbonwork and delicate rosettes.

Electric Teapot. A feature of the nickel-plated electric teapot illustrated is the "tea ball." This perforated cage is filled with tea and suspended by a chain in the water after it has boiled. It can be raised when required, and the chain has a weighted knob which holds the tea ball out of the water so that the tea cannot be stewed. Connector, flexible cord and lamp-holder adaptor are supplied with the teapot.

Teapot Stand. A teapot stand is often necessary on polished wood tables and trays. For a silver teapot a small salver is sometimes used. Many different types of teapot stands are sold. In shape they are usually circular or square, and they are made of glazed earthenware, various kinds of metal and stone. The metal ones, because of their heat-conducting properties, are usually raised on wooden feet. See Salver, Cup.

TEAPOY. This word has two meanings. In one it is a small table supported upon a tripod or upon four legs, and used chiefly for holding a tea service or an urn. In the other it is a receptacle for holding tea. These tea-poyes were the early form of tea caddy and were made of china or earthenware.

TEA PUNCH. This good summer beverage is made in the following way: Make a gallon of fairly weak tea, cover it and let it stand for 5 min. before straining and sweetening it to taste. When it is cold, half fill a punch bowl with cracked ice and add the tea and the strained juice of four lemons. Small pieces of pineapple, a few stoned cherries, some sliced banana, a handful of fruit, and, if required, a little more sugar, should be added just before serving. See Punch.

TEA ROSE. This is a group of garden roses, descended originally from the China rose, *Rosa indica*. They are distinguished by slender and somewhat spreading growth and are rather less hardy than the hybrid teas and hybrid perpetuals. They bloom in summer and in autumn and flourish best on a sunny sheltered border. See Rose.

TEASEL. The dead flower-heads of the teasel or fuller's teasel, owing to the stiff, spiked bracts that cover them, are employed in textile manufacture to raise the nap on cloth. The ordinary household use of this plant is purely decorative, the close oval heads of mauve flowers, each rising from a circle of long spines, on straight, stiff stems, making it an excellent cut plant for a tall vase. Teasels last well in water, retaining their beauty even after the flowers are withered. They are raised from seeds sown out of doors in May, and the plants will bloom the following year.

Owing to use of teasel heads for teasing cloth, the name teasel wool is given to a kind of wool, the surface of which is raised with a wire brush after it has been knitted or crocheted.

TEA SERVICE. People who possess old china tea services rarely care to use them every day. Exquisite reproductions are obtainable from the modern Worcester, Minton, Wedg-

wood and other potteries, for those who like their tea tables to present an old world appearance and possess the great advantage that with a standardised design each piece is replaceable in the event of breakage. Many are moderately priced.

Somewhat more expensive are the modern designs and delightful shapes of the china services from the Shelley and Newport potteries. In semi-porcelain there is a good choice of old and new patterns. In plain colours, such artistic services as those in Moorcroft powder blue ware have much to



Tecophilaea cyanocrocus, the Chilean crocus, a beautiful spring bulb with blue flowers. It needs a warm, sheltered situation

recommend them. Combination breakfast and tea sets are useful: in this way space is saved, and larger cups are at hand to match the tea cups for those who prefer them. In many patterns, teapots, hot water jugs, toast racks, cake plates, muffin dishes, and butter and jam dishes can be obtained to match. Particularly beautiful is the ware with a honey glaze ground.

Attractive tea services are also available in plastic materials. They are made in self colours, or mottled.

A silver tea service is composed of teapot, cream jug, and sugar basin. Sometimes a tray and spirit kettle or hot water jug are included. See China, Silver.

TEASPOON.

Teaspoons may be of silver or electroplate. They are often sold in sets of 6 or 12, or form part of a set of table silver. In larger sizes they are used with breakfast cups for tea or coffee. For afternoon tea and after dinner coffee ornamental designs in smaller sizes are specially made. The ordinary teaspoon is used as a measure for liquid flavourings in cookery. It is equivalent in this sense to $\frac{1}{2}$ of a fluid ounce. See Silver; Spoon.

TEA TABLE. Usually of light build and of small size, a tea table is generally about 27 or 28 in. high. It is obtainable in a large number of shapes with single and folding tops, and is made in both wood and wicker. On account of its uneven top the latter kind is only suitable for use with a tray.

Tea Wagon. See Service Wagon.

TECOMA. This is the name of a class of evergreen and leaf-losing climbing plants. Some may be planted against a sunny wall out of doors, while others must be grown under glass. The two kinds suitable for a wall are

grandiflora and *radicans*, both with reddish, tube-shaped flowers. Both are vigorous climbers and will reach a height of 15 ft. or more. They should be pruned in spring by shortening the side shoots.

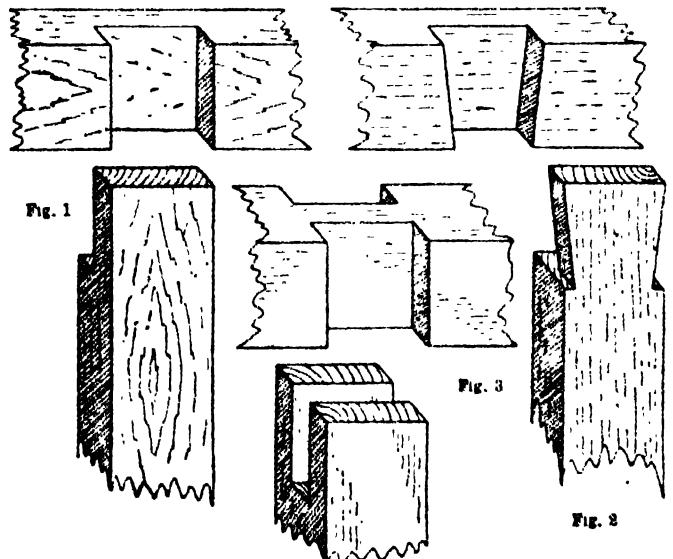
Of those grown in a heated glass-house *capensis*, orange-red, *jusminoides*, white, and *valdiviana*, orange-yellow, are the best. Pron. Te-cō ma.

TECOPHILAEA.

These are blue-flowered bulbs which may be grown in a border at the foot of a sunny wall or in pots in the greenhouse. They are not hardy enough for the open garden. They like sandy, loamy soil and should be planted in autumn 3 in. deep.

Cyanocrocus, blue, and *Leutichium*, deeper blue, are two beautiful kinds; both flower in spring. The popular name is Chilean crocus.

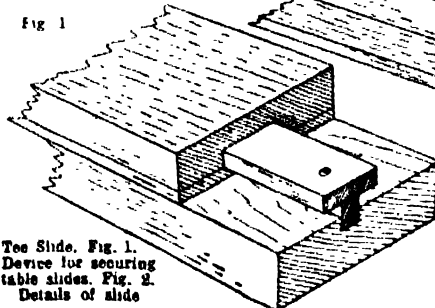
TEE JOINT. This phrase is applied to the position of a joint rather than to the form of its construction, and is used when a centre or intermediate upright runs into a top rail. For example, the tee joint may be halved, as in Fig. 1, or it can be dovetailed, as in Fig. 2. The bridle joint in Fig. 3 is often used as a tee joint, and so is the ordinary mortise and tenon. The name is not applied to similar positions of upright and rail where the former is stub tenoned. See Joint.



TEE JOINT. Three methods of attaching a centre upright to a top rail. Fig. 1. Halved tee joint. Fig. 2. Dovetailed. Fig. 3. Bridle joint

TEE SLIDE. Used in securing dining-table slides, the tee slide is useful because no cross-rails are required under the table when this form is fitted. The table slides are first worked to the correct shape by special planes and the tee slides are shaped to fit and are let in, glued and screwed.

Fig. 1



Tee Slide, Fig. 1.
Device for securing
table slides, Fig. 2.
Details of slide

to the adjoining slide. The amateur will find some difficulty in planing the groove, but with hardwood the table slide can be built up with 3 pieces of wood, as in Figs. 1 and 2. A suitable groove is cut in the thicker piece, and then the two thinner pieces are glued and screwed on. Accurate workmanship is needed to ensure easy running, but if this is attended to the method is preferable to any other. To prevent sticking, the inside of the groove should be coated with blacklead. See Dining Table.

TEETH. A tooth exhibits a crown, a neck and one or more roots or fangs. The roots are composed of dentine, or ivory, and this exists also beneath the crown, surrounding a hollow in the centre of the tooth, described as the pulp cavity, which is continued down into the roots. In this cavity is the pulp, consisting of blood vessels, nerves and loose connective tissue. The crown is formed of an intensely hard substance known as enamel; it forms a cap of varying thickness for the tooth and may have two or more eminences, or cusps, on its biting surface.

Teething. The process of cutting teeth is called teething or dentition. There are two dentitions. The first of the milk teeth to appear are usually the lower central incisors, and this generally happens in the 6th month. In a short time the upper central and all the lateral incisors emerge, and then follow in order the first molars in the 12th month, the canines in the 18th month, and the second molars in the 24th month. Variations of these times occur even in healthy children, and in rickets dentition may be much delayed.

The second dentition begins about the 6th year, with the appearance of the first permanent molars, and each year after this the other permanent teeth are out—the central incisors, the lateral incisors, the first premolar, the second premolar, the canines and the second molar. The third molar tooth may appear about the 17th year or not until the 25th, and is also called the wisdom tooth, sometimes it does not erupt at all.

The first teething is sometimes a trying event for the infant and the gums may be swollen, hot and tender, and the child is feverish and restless. The digestion may be upset, and there may be constipation or diarrhoea. Sometimes there is carache, indicated by restless movements of the head and crying. It is not uncommon also for a child to suffer from bronchitis while teething. Another possibility is that the child may have convulsions (q.v.).

A child that is being suckled should not be taken off the breast while it is having difficulty in teething. Cool, boiled water may be given freely to cool the mouth and relieve thirst. If

there is constipation fluid magnesia in the mornings is a useful remedy, and the best remedy for diarrhoea, at any rate at the beginning, is a teaspoonful of castor oil. Earache may be treated by applying cold cloths to the ear. As the child salivates very freely, it may soak the garments over the front of the chest, and care should be taken to prevent this.

Fig. 2

The use of a baby's comforter creates a danger of infection, because the comforter may be dropped on the floor and be put back in the baby's mouth without being sufficiently cleansed, but there is this further count against it, that it may cause malformation of the jaws.

It is desirable that an infant should begin gnawing at crusts or rusks when it is about six months old, as this practice helps to develop the jaws, and insufficient development may be due to the child not having been given firm food to gnaw; but this is quite a different thing from a baby keeping a comforter stuck in the side of its mouth more or less constantly.

There is rarely any trouble with the second dentition. Sometimes the teeth are overcrowded and are placed irregularly. When there is no hope of their settling into a correct position one or more should be extracted. Unless teeth are efficiently cleansed there is a tendency to the deposition of tartar about the neck of the tooth, and this may separate the gum from the tooth, giving access to bacteria and possibly leading to pyorrhoea. Moreover, carbo-hydrate foods, such as sticky fragments of bread, may lodge in the crevices between the teeth, and ferment, giving rise to acid substances which attack and dissolve the tooth-substance. That is the beginning of caries.

The natural method by which teeth are cleaned is by chewing crisp foods and such as require a good deal of mastication. The teeth should also be brushed, however, twice a day at least. The motion of the brush should be up and down and it is necessary to hold it vertically when brushing the backs of the teeth. Parts which cannot be reached by the brush can be cleansed by drawing a strand of dental floss between the teeth.

A smooth dentifrice should be selected, as erosion of the teeth has followed the use of a gritty dentifrice. The tooth is worn away at the gum margin and decay is encouraged. A common cause of erosion is the little metal clip often used by dentists to keep a small denture in position. This should be avoided whenever possible, and so far as the upper jaw is concerned the use of a sufficiently large plate may make clips unnecessary.

As soon as decay begins the parts should be cleaned out and stopped, and it is only prudent to have the teeth examined periodically by a dentist so that the first beginning of caries may be discovered and dealt with.

The importance of keeping the teeth sound cannot be over-estimated. Apart from the digestive troubles that proceed from deficient or defective teeth an enormous amount of illness is caused by the absorption of poisons from defective teeth.

Pain in a tooth, or toothache, is dealt with under that heading. Excessive bleeding after the extraction of a tooth may be arrested by folding a part of a handkerchief into a pad and biting on it, or by plugging the socket with cotton wool.

Artificial Teeth. Artificial teeth must be kept scrupulously clean. They should be taken out at night and brushed with tooth powder, and then be left in water containing some antiseptic. For a vulcanite plate this might

be hydrogen peroxide, but for a metal plate it may be necessary to use a weak solution of chlorinated soda from time to time in order to keep the metal bright. A removable denture is much to be preferred to bridge-work, as juices may lodge beneath the bridge and decompose. See Caries; Dentifrice; Pyorrhoea; Tartar; Toothache.

TELEGRAM. Telegrams are divided by the Post Office into two classes: those sent within the United Kingdom and those sent to places abroad.

Inland Telegrams. The charge for an ordinary inland telegram is 1s. for the first 9 words, and a penny for each additional word. Telegrams to Eire are treated as inland telegrams but are charged at the rate of 1s. 6d. for 12 words, and a penny for each additional word. All inland telegrams and night telegraph letters handed in on Sunday, Good Friday and Christmas Day are charged 6d. extra. In Scotland the extra charge applies to Sundays only. For an extra charge of 6d. an inland telegram is specially expedited both in transmission and delivery. The word "priority," which is not charged for, should be written before the address of the telegram. The inland priority service is available only for full-rate telegrams within the United Kingdom—it is not available for telegrams to Eire.

The address of a telegram should be sufficiently full to enable it to be delivered without difficulty; and in telegrams for towns the name of the street and the number of the house (with suitable indication in the case of flats) should be given. The address of telegrams for towns in which postal district, initials and/or delivery office numbers are in use should include such indications.

In telegrams the main principles of counting words are:

Addresses: The essential designation of the place or office of destination counts as one word. As a rule all the necessary words in an address which follow the name of the thoroughfare count as one word.

Message: Place names count as one word. Any other English expression usually written as one word (with or without hyphens) in ordinary correspondence counts as one word.

Latin words or words in any modern European language, including Esperanto, written in English characters, are counted in the same way as English words; but words not forming part of such languages are counted at the rate of 5 letters to a word. Combinations of letters not forming recognizable words—including groups of initials, for example G.P.O. and H.M.S., are counted at the rate of 5 letters to a word, provided the letters are to be signalled in group form. With the exception of words which are ordinarily written as one, or coupled by hyphens, such as father-in-law, twenty-six, no combination of words is counted as one word. Any compound name which is ordinarily joined together by a hyphen or hyphens is counted as one word when so written, for example Beauverie-Tracey and Cave-Brown-Cave. Established abbreviations such as can't and won't are counted as single words. Figures are counted at the rate of 5 figures to a word. Fractions are counted according to the number of figures employed, the bar of division being counted as a figure.

Delivery of Telegrams. Telegrams are delivered by messenger free of charge within the town postal area or within 3 miles of the telegraph delivery office nearest the address, whichever is the greater. Beyond the limits of free delivery there is a postage charge of 6d. per mile or part of a mile, the distance being calculated from the limit of free delivery. In Eire the limit of free delivery is one mile, but the charges for postage for a telegram to Eire handed in at an office in the United

Kingdom are not prepayable. A reply can be prepaid to any inland telegram. If the form is not used its value will be refunded.

Greetings Telegrams. For a charge of 2s. for 12 words and 1d. for each additional word any inland telegram will be delivered on an ornamental form enclosed in a golden envelope. This service is particularly suitable for messages of greeting, congratulation, or good wishes. The word "greeting," which is not charged for, should be written before the address.

Redirection. Fully addressed telegrams may be redirected to a second address either by the Post Office or by an agent of the addressee. The charge for redirection is 6d. per telegram if the original and new addresses are in the

same area, and in all other cases at the ordinary inland rate. Instructions for the redirection of telegrams are recorded free of charge for 3 months; for any period beyond this, up to one year, the fee is £1 1s.

Foreign Telegrams. Telegrams can be sent to places abroad, the charges varying with the distance and other considerations. Special forms are provided for these telegrams. They are accepted without restriction to most places abroad, but a few countries maintain restrictions on them. There are special reduced rates for telegrams between any two places within the British Commonwealth, and between Great Britain and any British garrison overseas.

TELEPHONES · PUBLIC AND PRIVATE

Regulations for Subscribers and Methods of Installation

This article is divided into two parts. The earlier is for the benefit of those who have, or wish to have, a Post Office telephone in their home. The charges and other details are those obtaining in 1952. Subsequent alterations and amendments will be found in the current Post Office Guide. The second part of the article describes how a man of modest means can find out how and can fit into his house a telephone service, connecting his own room with another. See *Batteries* (p. 1260), *Microphone*.

The Post Office controls the telephone system of the whole of Great Britain and Northern Ireland (except the local system in the Channel Islands and the City of Hull). Anyone, therefore, desiring a telephone (other than in one of the excepted localities) may apply to the local postmaster or to the telephone manager whose address is given in the local telephone directory. The work of installation will be carried out by Post Office engineers after the necessary agreement has been signed. The subscriber must not interfere in any way with the telephone mechanism, if anything goes wrong he must tell the authorities, who will put it right. Every telephone line is connected with an exchange and is given a number.

Charges. The charges for telephone service payable by a subscriber consist of an initial connexion charge, a continuing quarterly (or monthly) rental, and a fee for each call. The connexion charge for an exchange line varies from 5s. to 15s. according to the amount of work involved. The rental varies according to the class of service—residential or business—and to the district where the line is required—London or Birmingham, Glasgow, Liverpool and Manchester, or the rest of the country. The charge for each call varies according to the distance to which the call is made.

Rental. Details of the scales of rental charges are given in the Post Office Guide and in the Telephone Directory, or they may be obtained on application at any Post Office. The usual minimum term for an agreement is one year. Telephone rentals are payable half-yearly. The rental is a fixed charge to cover the cost of providing, by means of a pair of wires, the necessary connexion with a telephone exchange. It differs according to whether the subscriber is in London, or in Birmingham, Glasgow, Liverpool or Manchester, or in any part of the rest of the country, and according to whether a business or residence subscriber is concerned.

Where the telephone is installed at a radial distance of more than 3 miles from the relative exchange an extra mileage charge at the rate of 10s. a half year is payable in addition to the ordinary rental charge.

Calls. The scale of charges for local calls is:	
Up to 5 miles	11d.
Between 5 and 7½ miles	3d.
7½ and 12½ "	11d.
12½ and 15½ "	6d.

the distances being measured between exchange and exchange, and with certain extensions of the above limits in London, Birmingham, Glasgow, Liverpool and Manchester. In the case, moreover, of subscribers in any area renting a line at the residence rate and without a coin box, 50 calls a half year, or the equivalent of 50 units of 1½d. per half year may be made without any charge beyond the rental.

Trunk Calls. Calls to exchanges at a greater distance than 15 miles from the originating exchange (with certain extensions of this distance in the case of London and the four large provincial cities where the area for local calls is larger than a radius of 15 miles) are known as trunk calls. The charge for these varies with the distance involved and the time of day at which the call is made. The charges are lowest during the evening and night. Full particulars will be found in the Post Office Guide and the Telephone Directory. Calls may also be made to most countries outside U.K. and certain ocean areas on the high seas.

Extension Lines. It frequently happens that a telephone user desires one or more of his lines extended from the main station to other parts of his residence, other outbuildings or works, or even, it may be, to his premises in another part of the district. In a commercial undertaking such extensions are a necessity, and in a residence a bedside telephone is a distinct convenience, as is frequently a line to the garage or chauffeur's quarters. Such extension lines are classified as internal or external according to the circumstance, and the rentals charged vary accordingly. They are relatively low, and full particulars will be found in the preface to each Telephone Directory. The rentals payable for exchange lines and extensions generally cover the provision and maintenance of any switchboard or private branch exchange which may be required to connect calls.

Shared Service. For this service, in which two subscribers share one line



Telephone. Fig. 2. Telephones often spoil the effect of an otherwise perfectly decorated room. Such a cupboard as this has been found a most satisfactory solution to the difficulty. House and Post Office telephones can be housed in a recessed cupboard, with shutter on the roll-top desk principle to enclose them when not in use.

Victor and Curran Studio

but enjoy nearly all the facilities of exclusive line service each subscriber pays 11s. 6d. per annum less than the rental for exclusive line service. Under present day conditions it has been found necessary to insist that all new and removing residence subscribers accept an obligation to share their lines if called upon to do so.

Connexion Charges. A connexion charge or transfer fee of 5s. per exchange line is payable where an existing installation is taken over without alteration. In other cases a connexion charge not exceeding 15s. is payable in respect of each exchange line, and one not exceeding 5s. in respect of each extension line. The connexion charge or transfer fee is not returnable. (A surcharge of 15 per cent. is payable in addition to the charges quoted.)

Removals. If a subscriber removes and wishes to have telephone service at his new address the Post Office will make arrangements wherever practicable. In all cases, however, the subscriber will be required to sign a fresh agreement, and a residence subscriber may have to accept shared service (see above). Apart from this the only other requirement in many instances is the payment of the appropriate connexion charge (see above) for service at the new address.

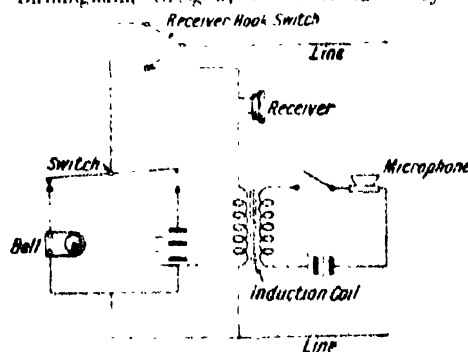
A charge is made for the removal of apparatus to fresh positions in the same premises.

Where the new occupier of a house or business premises previously occupied by a subscriber is an applicant for telephone service his claims to the vacant line are considered in relation to those of other waiting applicants in the immediate neighbourhood.

Directories. Each subscriber is supplied with a free copy of the alphabetical telephone directory for his area.

Additional copies, and copies of directories for other districts, may be obtained on payment of a small charge, but the free issue of new editions to private subscribers was suspended in 1952.

Classified telephone directories (trades and professions) are compiled with the authority of the Postmaster General by Messrs. J. Weiner, Ltd., 71-75, New Oxford Street, London, W.C.1.



Telephone. Fig. 1. Circuit shown with receiver on hook, bell being rung by current from line. The dotted line shows microphone circuit complete with the receiver removed.

Call Offices. Numerous public call offices are provided in street kiosks and in many post offices, railway stations, and shops. The minimum charge for a local call from a call office is 3d. while trunk calls, etc., are available at the appropriate rate, plus a call office fee of 3d. The charges are either collected by an attendant or, more usually, paid direct by the caller into a metal box fitted below the telephone instrument.

Telegrams by Telephone. Inland and overseas telegrams can be dictated from subscribers' telephones or from kiosks or other call offices. Telegrams can also be delivered to telephone subscribers by telephone, and can be addressed to subscribers' telephone numbers.

Time Service. Subscribers or call office users in any part of the country can obtain the correct time by making a call to the speaking clock, which is in operation in London and certain other centres. Oral announcements of the time of day are given from the clock at intervals of 10 seconds. The only charge payable is the ordinary charge for a call to central London or to the appropriate centre. Full particulars are to be found in the telephone directories for London and the other centres concerned. Subscribers on exchanges from which the charge to the speaking clock exceeds 1½d. may, if they so desire, obtain the time by the local exchange clock at a charge of 1½d. by asking the operator for *The time*.

Weather Forecasts. The latest information about the state of the weather in various parts of the British Isles, the Continent, and the eastern Atlantic, and also the latest weather forecasts, can be obtained from the Meteorological Office, London, telephone number H01, born 3434, Extension 629. This service is available at any time of the day or night, including Sunday. Similar information and forecasts can be obtained from local meteorological offices.

Morning and Alarm Calls.

A subscriber can arrange for the exchange to ring his number early in the morning, or at any other time of the day or night, so that, for example, he will not be late for an important appointment. He should for notice the exchange by telephone with his number and the time at which he would like to be called. This service is not available at some small country exchanges.

Express Messenger. A telephone subscriber can obtain the services of an express messenger by telephoning to the nearest post office. The charges for this service are calculated on the whole distance travelled by the messenger from the post office, at the rate of 6d. a mile or part thereof.

Telephone Letters. A telephone subscriber can telephone messages to many post offices, to be written down and dealt with as express or ordinary letters. The same facility is available at telephone call offices. Telephone express letters can be delivered by messenger only during the hours of telegraph business, and on Sundays to places within the London postal area only.

To send a message of this character on a telephone subscriber's (non-coin box) circuit, a call should be made in the ordinary way to

the appropriate office. The caller should explain whether he desires to send an express letter or an ordinary letter.

To send a message from a call office or coin-box telephone, the caller should ask the local exchange for the service which he requires, namely, express letter or ordinary letter service, and tell the operator the name of the office at which it is desired that the letter should be written down for delivery or for transfer to the post, as the case may be. No telephone number need be given.

The charges for a telephone express or ordinary letter are: the charge for the telephone call made to the office at which the letter is written down; the charge for writing down the message, namely 3d. for the first 30 words (including the address) and 1d. for every ten words or part thereof in excess of 30. The charge for delivery, which is 6d. a mile or part thereof for express letters, or for ordinary letters the appropriate postage (which is rounded to the next penny in the case of call offices and coin box installations). For telephoned express letters, the charge for express delivery is calculated on the distance traversed by the messenger. It is therefore advisable that the appropriate office nearest to the address should be chosen.

The recipient of a telephoned express letter can employ the delivering messenger for the purpose of sending another express letter back to the post office to be telephoned to the sender of the original message. For this service the charges are (1) the express letter mileage rate to the post office, plus (2) the appropriate telephone charge (including a call office fee) from the post office to the place of destination.

A message to a telephone subscriber in the London Telecommunications Region, posted anywhere in Great Britain in time to reach the

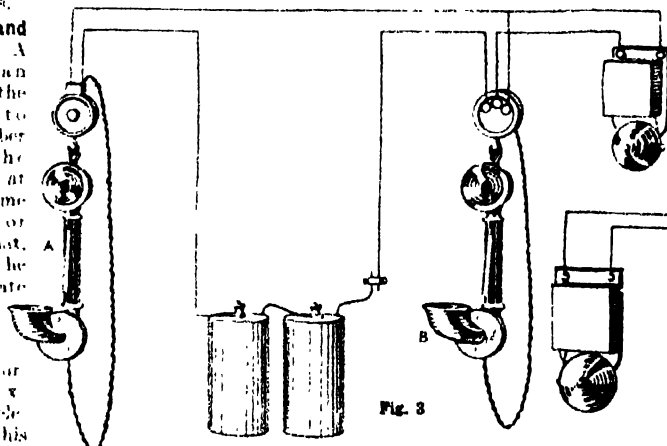
has control of all wires leading to the various exchanges. There is, however, nothing to prevent a private individual from installing a telephone of his own and using it for communication between one part of his premises or estate and another.

A person who possesses, or contemplates possessing, such a telephone line must carefully note a few matters. He must remember that he cannot use his own line to communicate with any house or premises that only possess a telephone attached to the public system.

Simple Domestic Telephone. The circuit for a telephone is shown diagrammatically in Fig. 1, the different parts being indicated. When a receiver is lifted off its hook the latter automatically makes a contact and places the apparatus in circuit. Normally, with the receiver at rest on its hook, the telephone line is connected to the bell. The simplest type of telephone system for domestic use is shown in Fig. 3. The apparatus consists in the main of two parts. At the top is a push, similar to a bell push, with a hook fitted to its underside and a plug projecting from the top. Wires from this plug are taken to the lower instrument, which is the actual telephone. At the upper end is the receiver, beneath which is a handle incorporating a switch, while at the bottom is the microphone.

The connexion of this instrument with another of identical design is shown in the diagram. This scheme enables the line to be worked in one direction only. That is, station A will only be able to ring station B. Station B can reply, but cannot originate a call. Such an arrangement is useful in the home when A is situated in the dining room and B in the kitchen. Ringing is accomplished by pressing the push at station A, but the line will not be clear for speech until the handle switches on both stations are pressed. The latter action is more or less automatically done in the handling of the instrument.

No induction coil is incorporated in this apparatus, as it is only suitable for working over short distances. The number of coils required will depend on the distance and the size of the conductors, but normally two only will be necessary. Such an installation may be fitted entirely with homely tools and by



General Post Office, London, early on Sunday morning, can be delivered on Sunday by telephone. Letters containing such messages should be addressed to the Central Telegraph Office, St. Martin's-le-Grand, London, E.C.1, and marked conspicuously *For telephone delivery on Sunday*. A broad blue or black perpendicular line should be drawn across the centre of each side of the envelope. The ordinary postage on the letter should be prepaid by means of stamps affixed to the envelope; and a charge of 3d. for a message not exceeding 30 words, and 3d. for each additional 30 words or part thereof, should be paid in stamps affixed to the paper on which the message is written.

Private Telephone Wires. The above remarks apply to the service of telephones operated by the post office, which department

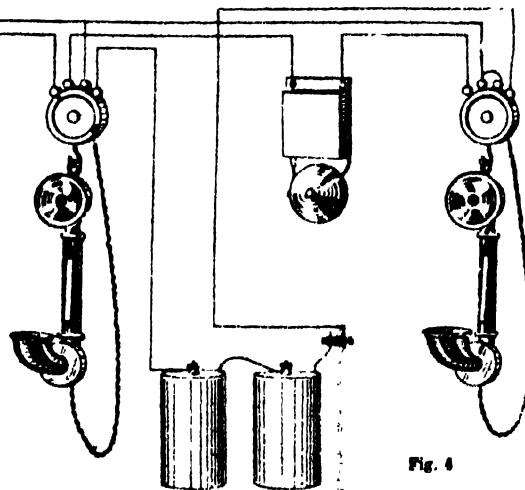


Fig. 3. Circuit of simple domestic telephone.
Fig. 4. Easily installed two-way type for home use

unskilled hands, as it is no more complicated than an ordinary electric bell. The use of twin wire over the longer distances will greatly facilitate the process of installation. Fig. 4 shows how the same instruments employing a slightly different type of wall push and an extra bell may be made to work in both directions. The main line consists of three separate conductors, and there are two bells. Such an

installation is still within the scope of the amateur or handyman of the house. In this instance it would be better to use single conductors, either laid side by side along the walls of the house, or else encased in wood or conduit.

The battery can consist of two dry cells of large size, and these should last for nine to twelve months, after which they should be scrapped and replaced. Both the above systems may be fitted to existing bell installations with very little addition. All that has to be done is the substitution of one of the telephone appliances for the ordinary bell push.

Telephone Receiver for Radio. The function of the telephone receivers in radio reception

is to convert the rectified impulses in the detector circuit into audible sound waves. The headphone magnet windings may be wound to have either a low resistance or high resistance. High resistance headphones are very sensitive and are thus particularly suitable for use with crystal receivers.

If you possess a valve receiving set, it is better to employ low resistance headphones (which are more robust) in conjunction with a telephone transformer to isolate the magnet windings from the steady current flowing in the anode circuit of the valve. This is highly important in a mains operated radio receiver. See Microphone.

TELEPHOTOGRAPHY FOR AMATEURS

Practical Details of an Important Branch of Photography

Though at one time thought to be the exclusive province of experts carrying specially cumbersome cameras, telephotography is now within the reach of all, and its attractions are clearly set forth in this article. See Exposure, Focus, Lens, Photography.

Telephotography may be roughly described as combining some of the advantages of a telescope with those of a camera. It provides a means whereby with an ordinary hand camera with normal camera extension, photographs may be taken on a much larger scale than with the ordinary medium focus lens.

Thus, with an ordinary camera photographs of distant views, high mountains, or architectural subjects are not only reproduced on a very small scale but are liable to be wrong in perspective. With a good telephoto lens distant objects can be photographed directly on a large scale, and subsequently further enlarged. Excellent photographs have, for instance, been taken with telephoto lenses of mountain peaks 90 miles away.

With the type of lens usually fitted to a camera the size of the image given on the focusing screen depends on the focal length of the lens. Thus, comparing a small pocket camera whose lens is $3\frac{1}{2}$ in. focal length with a large camera the lens of which has a focal length of 7 in., the image seen on the focusing screen or negative will be twice as large with the 7 in. lens as it is with the $3\frac{1}{2}$ in.

In order, therefore, to get an image four times the size, a 14 in. lens would be required, and so on in proportion. Now, since with the normal lens the focal length is approximately the distance between the back of the lens and the focusing screen, the greater the magnification required the longer the focal length and the bulkier and more unwieldy the camera.

These difficulties are overcome by the use of a telephoto lens, which consists in principle of two combinations of lenses: (1) the normal positive lens, or combination acting as a positive lens, such as is used in every camera; (2) a negative lens, or lens combination, such as is used in the eye lens of opera glasses. The first combination, the positive lens, may be the ordinary lens of the camera, in which case a negative lens is added. In the majority of cases the negative and positive lenses are combined in a telephoto system, which is used by itself as a complete lens.

An example of the latter is the Dallón (Fig. 1), a series of anastigmatic

telephoto lens of 1 to 40 in. focal length working at apertures of f5.6 and f7.7 for reflex and miniature cameras and f6.5 for folding hand cameras. The latter are suitable for use on small $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. cameras. Another form is the Adon adjustable type (Fig. 2), which is designed for use by itself on all sizes of cameras possessing focusing screens. It includes a micrometer movement for focusing and an iris diaphragm. At the same extensions as an ordinary lens it gives a picture three



Telephotography. Fig. 1. Dallón telephoto lens, suitable for use without any other lens. Fig. 2 (above). Adjustable type Adon lens, for use on cameras with focusing screens.

Courtesy of J. H. Dallmeyer, Ltd.

times the size, and it will cover completely any size of plate from $3\frac{1}{2}$ by $2\frac{1}{2}$ in. up to 15 by 12 in., provided the camera is capable of sufficient extension.

Thus, for a $\frac{1}{4}$ plate an extension of 6 in. is necessary, which is the normal of a single extension $\frac{1}{4}$ -plate camera. Its weight complete is only 7 oz. Of course, it must be remembered that the greater the extension available on the camera the greater the magnification obtained.

Other good types of telephoto lenses are the Zeiss-Magnar and the Dallmeyer Grandac, both working at f10; and the Ross Teleros, which is of large aperture working at f5.5 and f6.3. Another Zeiss lens is the Tele-Tessar, working

at f6.3. The Dallmeyer New Large Adon series work at f4.5, permitting telephoto snapshots and requiring extensions of $4\frac{1}{2}$ in. for a $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. camera, and $6\frac{1}{2}$ in. for a $\frac{1}{4}$ plate, the magnification being 2. All the lenses described, with the exception of the Adon (Fig. 2) and the Grandac, are of the fixed focus type, focusing being done by racking the camera front in the ordinary way. Focusing lens mounts can, however, be supplied in most cases for fixed focus cameras such as the Leica, Exakta, etc.

With telephoto lenses of the fixed focus type which are used in place of, not in addition to, the ordinary camera lens, there is no complication of any kind. They are used in precisely the same way as the ordinary lens, and exposures are made according to their aperture or f-number. When adjustable type telephoto lenses are used, or a negative lens is used with the moving positive, or when they are of the variable focus type, certain calculations or references to tables require to be made. With Adon and certain other lenses special calculators, in the nature of ready reckoners, are supplied. The data required are: (1) the effective aperture of the combination; (2) its focal length; and (3) degree of magnification.

The magnification, or size of the image, increases proportionately with the camera extension. The degree of magnification is found by dividing the distance between the back of the telephoto attachment and the focusing screen by the focal length of the telephoto or negative lens and adding 1. Thus, to take as an example, a telephoto lens working at 10 in. extension, when combined with a positive lens, the focus of the telephoto negative being $2\frac{1}{2}$ in., $\frac{10}{2\frac{1}{2}} + 1 = 5$, i.e. the magnification on the negative is 5 times linear, and 25 times in area.

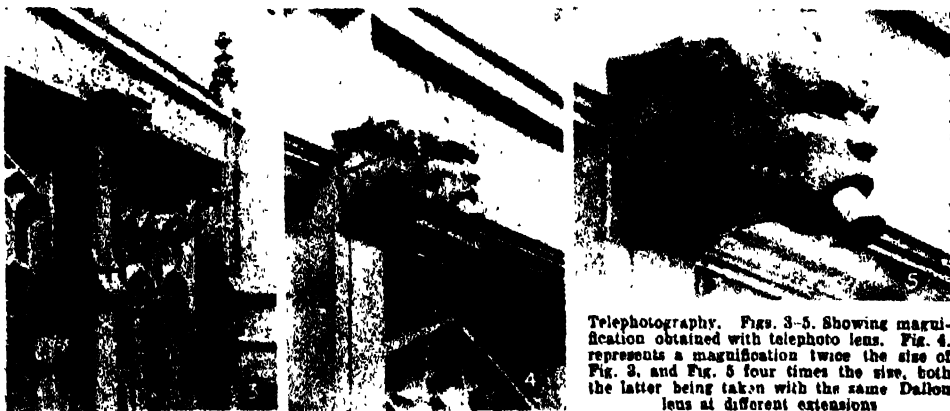
If it is desired to find the distance at which the camera should be placed in order to fill the plate or film with an image of an object of given size, the following formula is used:

$D = \text{distance of lens from object}$; $F = \text{focal length of telephoto lens}$; $O = \text{size of object}$; $PF = \text{size of plate or film}$.

Then:

$$\frac{O}{PF} + F \div F = D, \text{ distance of lens from object}$$

The effective aperture of the whole combination is then obtained by multiplying the aperture, or f-number, of the positive lens by the degree of magnification. Thus, if the positive lens regularly used on the camera works at f6.8, the effective aperture when combined with the telephoto lens will be $f6.8 \times 5 = f34$. It is therefore seen that exposures must be greatly increased, and further that the greater the magnification and camera extension used the more the aperture is reduced and the exposure increased. Not only does the exposure increase with increasing extension, but magnification is also limited



Telephotography. Figs. 3-5. Showing magnification obtained with telephoto lens. Fig. 4 represents a magnification twice the size of Fig. 3, and Fig. 5 four times the size, both the latter being taken with the same Dallón lens at different extensions.



by the capacity of small cameras for extension. To find the total focal length of the whole combination, multiply the focal length of the positive lens by the degree of magnification; thus, if the focal length of the camera lens be 5 in. and the magnification 5 times, the total focal length is 25 in.

For all normal purposes the magnification of 2 to 4 times will be found sufficient; very effective work is possible with a magnification factor of 2, which actually means increasing the area of the image 4 times, since the magnification factor is a linear one. With some telephoto lenses magnification factors are marked upon the mount.

A little practice will soon enable the amateur to calculate the exposures required. The basic rule for exposure when using a combination of the telephoto negative lens and the ordinary positive camera lens is to multiply the exposure required by the positive by the square of the magnification factor. Thus, if the lens without the telephoto attachment requires under certain conditions an exposure of $\frac{1}{256}$ sec., and the magnification is three times, the exposure required when the telephoto lens is added will be $\frac{1}{256} \times 3^2 = \frac{1}{256} \times 9 = \frac{1}{28}$ sec. This, of course, applies only to telephoto lenses of the fixed focus type.

When variable focus telephoto lenses are used in combination, it is necessary to find the aperture or f number of the whole combination according to the rule already stated. This f number can then be used with any exposure meter in the ordinary way. If the telephoto lens itself is stopped down the length of exposure must be multiplied by the number of the stop used.

It is necessary to calculate exposures with telephoto lenses rather more closely than with ordinary lenses, and it will be found in practice that exposure times given by the calculations referred to are maximum figures, which should not be exceeded, particularly with distant objects, owing largely to atmospheric haze. It may be found, in fact, that an exposure of half the calculated time will give good results with a distant object. For objects at moderate distances the calculated exposures are correct. When photographing distant objects, results will always be improved by the use of colour screens as used with panchromatic plates. They cut out the atmospheric haze, but must

be of good quality, as any defects in them are magnified by the telephoto lens.

Telephoto lenses can only be used with cameras that possess both focussing screens and means of extension. Further, the camera and its tripod should be as rigid as possible, since any vibration will destroy the definition when high magnification is used.

It is not necessary, however, to carry the very heavy apparatus once thought to be essential. If reasonable care is taken, and ample

from the front of the camera baseboard to one of the legs of the tripod will help considerably to ensure steadiness.

Focussing must, of course, be done very carefully and very finely ground glass used as the screen. A magnifying focussing eyepiece used on the focussing screen will be found of great assistance. Such a glass may be purchased from any photographic dealer. All telephoto lenses should be fitted with long hoods, such as that seen in the photograph, Fig. 2. These hoods cut off stray light and greatly improve the brilliancy and contrast of negatives.

The series of illustrations Figs. 3 to 9 demonstrate some of the varied uses of telephoto lenses. Figs. 8 and 9 show examples of subjects which could not otherwise be satisfactorily photographed at all.

For nature photographs (Figs. 6 and 7) the telephoto lens offers the immense advantage of being able to secure pictures on a good scale at a considerable distance away. Similarly, groups and street scenes are much more easily obtained. Not only, however, are the photographs obtained on a good scale, but the actual perspective rendering is greatly improved.

TELESCOPE. There are two main types of telescope, refracting and reflecting. The former is suitable for either terrestrial or astronomical observations, and the latter usually for astronomical observations only.

In the refracting telescope the light from the object observed passes direct through the object glass, and the image formed is observed through a magnifying eyepiece. In the commonest form of reflecting telescope, known as the Newtonian reflector, the light from the object observed is collected by a mirror at the base of the tube, and reflected into a small mirror. The image formed on the small mirror is observed and magnified through an eyepiece.

The function of the object glass or the mirror, as the case may be, is to gather sufficient light to make a perceptible image in the focal plane. The function of the eyepiece is to enable the eye to see the image when as near it as possible, so that the angle it will subtend at the eye may be large.



Telephotography. Fig. 6. Nature photograph taken with an ordinary lens. Fig. 7. Showing how the Dallén telephoto lens obtains a large scale photograph of the central feature from the same standpoint as Fig. 6.

time allowed after focussing, etc., for camera and stand to become perfectly steady, fairly light apparatus may be used. With the higher magnifications an additional strut fitted



Figs. 8 and 9. Statue of Louis XIII at the chateau of Blois; Fig. 9 being a good example of the value of a telephoto lens for photographing from a distance an awkwardly placed subject of this nature.

Photos: Char. West

TELEVISION IN THE HOME

The Basic Principles and Methods

This contribution is complementary to the interconnected series of wireless articles in our work. It explains the fundamental methods of transmitting an image from studio to receiver. See Broadcast Receiving Sets; also Wireless Reception.

Daily television services are transmitted by the British Broadcasting Corporation from London, serving the Home Counties and south coast; Sutton Coldfield, near Birmingham, serving a large part of the Midlands; and Kirk o' Shotts, serving the south of Scotland. In 1952 work began on a transmitter at Holme Moss, near Huddersfield, which will provide programmes for Lancashire and Yorkshire. Effective range of existing stations is about 70 miles, but this has been considerably exceeded under favourable atmospheric and topographical conditions. Mobile units are used for outside broadcasts from places within 20 miles of a transmitting station. Transmission is on ultra short wavelengths: 6.6 metres for the vision part of the programme, and 7.2 metres for the accompanying sound.

Television, particularly of outside events, has largely been made possible by the compactness and adaptability of the Emitron television camera, the most significant single development connected with the new art. The most simple way to understand the principle of "picture analysis" is to look closely at a newspaper reproduction of a photograph. It will be seen that it comprises thousands of dots and that the picture is built up by means of variations in the quantity of ink represented by individual dots.

Similarly, the Emitron camera embodies a screen which consists of thousands of tiny photo-sensitive nodules, and each of these nodules carries a charge of electricity proportional with the light thrown upon it by the lens of the camera. Thus, instead of an ink picture, as with the newspaper illustrations, we have an "electricity picture."

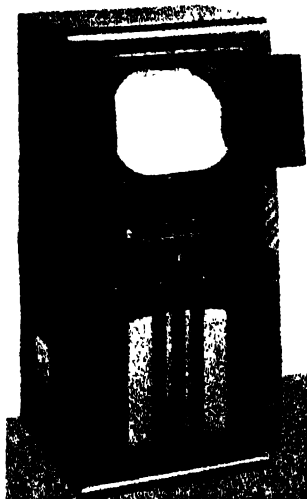
The Emitron camera also has an "electron gun" which shoots at this electricity picture an "electron stream" composed of millions of particles of electricity. This stream sweeps across the electricity picture 405 times in a fraction of a second, shifting its line of focus a minute degree with each successive sweep, so that the whole area is explored. As it passes each of the nodules, so it carries away with it the electrical charges on them in the form of an electric current which varies in strength as with the amount of light falling upon the individual nodules.

Therefore, the picture has been transformed into a fluctuating current which is as relatively simple to transmit as that which represents speech or music in ordinary broadcasting.

The Receiver. In the most widely used type

of television receiver the end of what is known as a cathode-ray tube forms a screen. This screen is covered with a substance which becomes luminous when a stream of electrons from a similar "electron gun" to that used in the camera falls upon it. If the line-traversing effect of this gun is made exactly to synchronise with the sweep of the Emitron's gun, and its intensity varied to correspond with the light changes recorded, then, line by line, the picture is built up. But

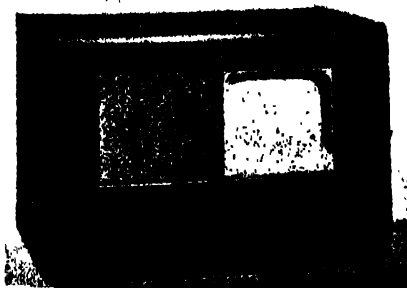
Television. Above: His Master's Voice, table model, operating on A.C. or D.C. Moderately priced, it is a little larger than a normal sound receiver.



Television. Above: Philips console receiver for vision and all-wave sound radio. Left: His Master's Voice combined television and all-wave sound receiver and auto-radiogram. The television screen measures 21 ins. by 10 ins., and the 5-valve super-het. radio receiver, covering short, medium and long wavebands, is tuned by push buttons. The ten-record auto-changer radiogram handles 10 in. or 12 in. records.

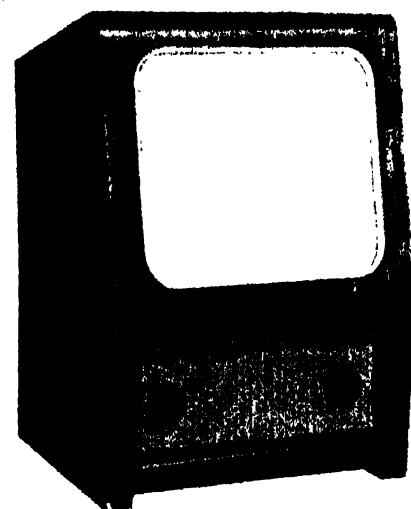


Television. Left: Philips television receiver for vision and sound. The four controls provide simple operation, and the deeply-recessed screen ensures clear and brilliant pictures without any necessity for a darkened room. The specially-designed vision and sound circuits give a high degree of brightness of picture-line and exceptional reproduction of sound tone.



this is done at the rate of twenty-five complete pictures a second; so fast that the eye does not see the process of building up, but only the flickerless "moving picture."

The process of picture analysis at the transmitter and the re-creation of the picture on the chemical screen of a cathode-ray tube is styled "scanning." It is accomplished by what are known as "Time Bases"



If a cathode ray tube is examined closely it will be seen that in its extreme, narrow end is the filament or cathode. As in the case of a valve (q.v.) this gives off electrons when it is heated. In front of the cathode is an anode in the form of a disk with a hole pierced through it, a second anode (cylinder-shaped), and then a third anode similar to the first, i.e., a disk with a hole in its centre.

The disk anodes are made highly positive and so attract the electrons strongly. A thin stream of the electrons shoots through the holes. The cylinder is made negative and repels the electrons, thus tending still further to squeeze them into a very narrow beam. The positions of the disk anodes affect the focusing of the stream as do lenses in a camera, their object in this respect being to ensure that the fluorescent screen on the end of the tube is struck with an intense beam, and made brightly to glow. The stream is also made

to pass between horizontal and vertical deflecting plates. These apply the scanning. Increasing voltages are transmitted to them by the "time base" circuits.

Electrical pressures as high as 4,000 volts and over are employed in the operation of cathode-ray tubes, but very little current passes. The total power consumption for the whole of the set may not exceed two or three units per week even if it is switched on for all the programmes. Nor is the high voltage a dangerous one as the current is limited.

Television Sets. The size of the picture varies on different sets from 4 in. by 3½ in. on one of the cheapest ones, to 24 in. by 20 in. on an expensive model. 10 in. by 8 in. is an average size which permits very comfortable viewing in the home. True black-and-white pictures sufficiently bright to be seen in ordinary room illumination are obtainable, though greenish reproduction and less brightness are found in the less expensive models.

Owing to the fact that there is only the one programme on a fixed wavelength, television sets require little or no further adjustments once they have been initially installed. An efficient instrument will also maintain perfect synchronisation. Special aerals (q.v.) are available for effective reception of programmes

with a minimum of interference within the service area of the transmitter. This is usually regarded as 50 miles under good conditions, but the range is frequently exceeded. Quality of speech and music is generally greatly superior to that on the medium or long waves owing to the wide side-bands on ultra-short waves.

In conclusion, television in the home is now entirely practical even for those possessing no technical knowledge whatever, and the results are so consistently good and the illusion of intimate contact with the televised scenes so real, that it will probably displace non-visual broadcasting more and more.

TEMPERATURE: Of the Body. The average temperature of human beings in health is 98.4° F. Usually it rises a little during the day and falls gradually during the night, so that the body is hottest in the evening and coolest in the early morning.

After a meal or after exertion the temperature is raised a little. In women it goes up more readily than in men. In children a considerable rise, amounting to slight fever, may occur from such trifling causes as a fit of crying or an attack of indigestion. Uniformity of temperature is maintained by a balance between the production and the loss of heat by the body.

The temperature may be taken by placing the thermometer in the armpit, the mouth, or the rectum. To take it in the armpit wipe the skin with a soft towel. Place the bulb of the instrument in the hollow. Fold the arm closely against the chest and cover the patient. To get a correct reading the thermometer should be left in place for a period of ten to fifteen minutes.

A quicker and generally more accurate reading is obtained with the mouth. Carefully wash the thermometer with soap and water. Place the bulb under the tongue. Leave it there for 3 min. The patient should keep his mouth shut and breathe through the nose. The clinical thermometer should always be washed after and before use. See Fever; Thermometer.

TEMPERATURE. In Gardens. All greenhouse temperatures and those that are necessary for the well-being of plants, which are given in this Encyclopedia, are those of the Fahrenheit thermometer, with its freezing-point of 32° and a boiling-point of 212°.

Plants are liable to severe injury from sudden changes of temperature. If ventilators are closed down too precipitately the alteration from an open, free, air to a close, stagnant atmosphere is likely to cause trouble.

TEMPERING AND ANNEALING. The process of heating and cooling steel to give it hardness is known as tempering. It is the opposite of annealing, by which a metal is softened. Different methods of tempering are employed according to the size and nature of the steel, but the principle is the same.

The steel is first hardened by being heated to a dull red glow and plunged into cold water or oil, the rapid cooling thus obtained making the metal dead hard. In this state it is generally too brittle and hard for practical purposes, and it is polished up bright and heated again, but this time by a more gradual process. When it has been brought to the required heat it is once more immersed in water or oil, which fixes the temper.

The degree of hardness or temper is indicated by the colour of the metal. If a bar of brightly polished cast steel is slowly heated from one end, a series of colour changes will travel along the bar in a definite and regular order. The first colour appearing is a light straw or yellow. Quenching the hardened metal at this state gives the hardest of cutting edges. The light straw is followed by a dark straw colour, giving a rather softer temper. Dark straw gives place to brown, a usual

temper for plane irons and wood-cutting tools. Light blue is the next colour, and this is the stage at which most knives are tempered. When it changes to a dark shade a fairly soft temper is obtained for articles such as wood saws and many forms of springs.

Annealing. Metals are annealed to make them softer and more easily workable. Steel and iron are annealed to remove the internal strains that are incident to manufacture. The piece of metal can be brought to a bright red heat in the stove, or in a forge or furnace if available. It is then left in the hot ashes all night, to allow it to cool slowly. Brass is annealed by slow and continued heating, taking care not to burn or melt the metal. Copper is annealed by bringing the metal to a dull red heat and then plunging it into cold water. In the case of pipes and similar objects the worker should beware of the escaping steam generated, which will pass up through a hollow body.

TENANT. A tenant is one who holds land or other real property of another. The terms of a tenancy depend entirely upon contract. In the absence of agreement to the contrary, when a tenant enters upon the land and pays rent for a year, or any aliquot part of a year, he is a yearly tenant, whose tenancy can only be determined by six months' notice to quit, expiring at the end of a current year of the tenancy. He is also a yearly tenant if his agreement is at a yearly rent, though that rent may be payable monthly, weekly, or in any other fashion. But if a tenant agrees to take a house at so much a month or week, he is a monthly or weekly tenant, entitled only to a month's or week's notice.

In the absence of agreement to the contrary, the tenant is liable to pay all rates and taxes except property tax. As to property tax, the tenant is liable to pay it to the tax collector but may deduct it from the first rent he subsequently pays to the landlord. See Distraint; Landlord; Rent.

TENNIS COURTS: GRASS AND HARD SURFACES

How to Lay Them and Provide the Necessary Accessories

This article describes the laying-out both of a grass and a hard court, afterwards giving directions for marking out a court. Related entries include those on Garden Lawn, Spirit Level. For the game itself the article Lawn Tennis should be consulted. See also Table Tennis.

Provided there is sufficient space, any household can, at comparatively small cost, provide itself with a grass tennis court. The chief expense, apart from the preparation of the ground, is caused by the necessity in most cases of providing wire or other fencing around the ground. The laying of a hard court is a more expensive matter, but it can be done by the amateur. The measurements of a standard court are given in the diagram on p. 692.

Laying a Grass Court. If the ground is fairly level the only preparation needed is to cut the grass closely and to water and roll it to as level a surface as possible. Any bad places can be filled in with a few turves cut from unimportant ground, cutting away the turf, making the soil beneath flat and level, and then fitting the new turf and beating it into place.

The preparation of the ground or turf should be carried out in the autumn or very early spring, so that it will have time to settle down before play begins. Slight bumps can be levelled by lifting the turf and scraping out the surplus soil, and immediately relaying the turves in the same place. All disturbed turf ought to be well watered daily for a few days, beaten flat, and rolled with a heavy roller at two-day intervals until the grass looks healthy. Mowing and rolling are then carried out, and in a short time the ground will be in condition for play.

When it is desired to construct a tennis court on a piece of rough meadowland, the nature of

TENCH. This fresh-water fish needs careful cleaning. It is usually boiled or fried, and is in season all the year round.

Before boiling tench clean it, remove the gills, and then soak it for about an hour in cold salted water. Rinse it in fresh running water, put it in a pan of boiling salted water, covering it completely, and let it cook slowly until it is tender—about $\frac{1}{2}$ hour. Garnish it with parsley and cut lemon, and serve some melted butter sauce separately.

To fry tench cover it with flour, put it into a pan of smoking hot fat, and brown it well on both sides. Then drain it and serve it garnished with fried parsley, and accompanied by some piquant sauce. See Sauce.

TENDON. Sinews or tendons are the strong, tough, fibrous cords by which muscles are united to the bones or other parts on which they act. Rupture of tendons is a not uncommon accident. In dancing, for instance, the Achilles tendon, which connects the muscles of the calf with the heel, is sometimes ruptured. The patient feels as if he had been struck a severe blow above the heel, and he loses power to use the foot, or may fall to the ground.

TENNIS CAKE. This iced fruit cake can be made in the following way: Beat together 5 oz. sugar and $\frac{1}{2}$ lb. butter or margarine until they are like cream, then add 3 eggs, one by one, beating all the time. When they are well mixed, stir in 1 lb. flour, $\frac{1}{2}$ lb. sultanas, 2 oz. peel, a little milk, and a few drops of essence of lemon.

Turn the mixture into a greased tin and bake it in a moderate oven until it is lightly browned; then let it cool on a sieve. When cold, cover the top with almond paste or marzipan, and over this put some fondant or royal icing. Decorate the border of the cake according to taste, write across it the word Tennis, using pink icing, and complete it with a design of two tennis rackets. See Almond Paste; Cake; Fondant Icing; Marzipan.

the soil, the general position of the site, and the geological conditions should all be taken into account, as well as the amount of money that can be spent in order to lay out the court. On a light or readily and naturally drained site the principal work is levelling, which is generally a matter of removing the earth from the high parts and depositing it at the lower. It is necessary to consolidate the made-up ground, and preferable to let it stand for a few weeks to settle down, and then to finish by very careful levelling. The surface can be made up with turves, or by sowing grass seeds, according to choice. A good result can be obtained by both methods.

When the ground is heavy or likely to become waterlogged in wet weather, it will be advisable to remove the earth to a depth of 12 in. or so and to make up the bottom with rubble or well-broken soil, adding agricultural drains as necessary. The rubble is raked and roughly levelled and then covered with a good layer of medium soil. This is raked and rolled and covered with a good top soil with an admixture of manure. The whole is levelled and watered, rolled, and allowed to settle. The surface is made good as required, and it can then be covered with turves or sown with grass seed.

Hard Courts. There are several types of hard court, some laid with cement or concrete, others with asphalt or a tar composition or with burnt ballast. A system extensively used

for hard courts is that developed in Great Britain by the En-Tout-Cas Co.

Courts laid with this patent method permit of play all the year round; they exhibit the characteristics of the best grass courts, and the bound of the ball is absolutely true. They are made with a special material laid on a bed of ashes, and being semi porous, they can be played on within a very short time after rain. The patent material is only laid by the company's workmen, but the whole of the preparatory work of making up the ground, levelling, and preparing the ash bed can be carried out privately if desired.

The preliminary stages are dealt with on similar lines to the grass courts. The levelled surface is covered with a layer of ashes to a depth of about $4\frac{1}{2}$ in., but local conditions may call for special treatment. These ashes are levelled and rolled. The foundations are covered with the patent material, well graded, screeded, and rolled until a flat and true surface is obtained. The sockets for the posts, previously embedded in concrete, are set at such a height that the top of the socket is about level with the surface. The ash foundation is not laid in a haphazard manner, but is properly graded. Generally speaking, when laid on a reasonably well drained subsoil, no additional drainage will be necessary.

The ashes are laid according to the type used, and graded with the largest at the bottom and the smallest at the top. The nature and amount of fine ashes in the bulk determines the manner of laying and keying the top ashes. A considerable quantity of ashes is needed, amounting to something like 65 tons for a court measuring 120 ft. long and 90 ft. wide, calculating on the assumption that the depth of the court will be about 4½ in.

The surfacing material is a special type of clay burnt in a kiln to such a hardness that it will not weather back after it has been laid and subjected to ground moisture. At the same time, it is not so much burnt as to reach the vitrifying stage, otherwise no binding power will be present. The colour is a shade of red that enables the path of the ball to be seen readily, even in glaring sunlight.

After the court has been made the lines are marked out and permanently defined by the use of metal or painted linen strips, the former composed of compressed lead tape. This is fixed to the court with long galvanized nails, and the tape beaten in level with the surface. The only subsequent attention is a coat of white paint about once a year.

Marking the Court. To mark out a tennis court a start should be made with one intended for the double game, as its markings can easily include those necessary for singles. First determine the position of the net and fix in the line chosen two posts 27 ft. apart, as in the diagram. Then take two measures and fasten their respective ends to the posts A and B.

On the first measure, which will go diagonally across the court from A to C, take a length of 47 ft. 5 in. On the second, which will go from B to C, take one of 39 ft. Pull both measures taut so that at those distances they meet at C, and this gives one corner of the court. At a point marked E, 21 ft. from B, put in a peg to mark the end of the service line. The other corner, D, and the other end of the service line, G, can be found by repeating the process.

Tennis Court. How to mark is shown. A, B, being

The same measurements on the other side of the net will complete the boundaries of the court. By prolonging the base lines $4\frac{1}{2}$ ft. on each side, and joining the four new points that are thus obtained, the side lines of a double court are made, and to complete the marking all that remains is to mark the central line by joining the middle points of the side lines.

For double court along the interior side lines need not be prolonged to meet the back lines. In all cases the net posts must stand at a distance of 3 ft. from the side lines. Therefore, if a single game is played on a double court, the net, unless the posts are shifted and a single court net is used, should be stayed up to the right height by means of single posts placed at a distance 3 ft. from the single court side lines.

Tennis Net. For the purpose of playing lawn tennis a net across the centre of the court is necessary. This is usually fastened to posts, one at either end.

These tennis nets are sold in various qualities. For ordinary use a fine hemp net with lines top and bottom is suitable, but a stronger one can be obtained with a linen band. More expensive ones have a band of woven web and a steel or copper headline with a hempen end and pins. The nets are fastened to posts of wood or metal, the latter being specially suited to hard courts.

Good wooden posts are of ash, fitted with brass ratchet for winding purposes. The posts are fitted into iron sockets which enable them to rest on the ground and these are fastened by pins driven into the soil. Metal posts are of iron or steel. As these cannot be pinned down on hard courts, they are set into an iron receptacle sunk into the ground. Steel posts are also made in the same way as iron ones and with portable iron feet, and ground screws are made for use on grass courts.

The illustrations show the modern methods of fastening the tennis net, both on grass courts and on hard ones. Fig. 1 shows a winding apparatus consisting of a cone drum, which has taken the place of the hollow drum formerly used. In the older types of ratchet the liability of the copper cord to kink and

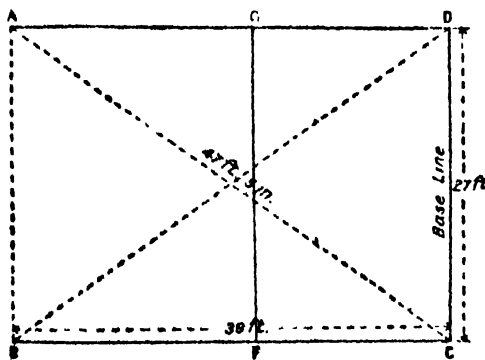
the copper cord to be laid up evenly. The post illustrated, Fig. 1, is $3\frac{1}{2}$ in. square, and its metal points are of nickel and brass.

Fig. 2 shows the socket for the post of a tennis net. This, suitable for use on grass courts, is usually fastened to the ground by leather pins, as shown, but it can be made secure by ground screws. Fig. 3 shows a socket made to stand on a hard court, especially one where no holes in the ground or flooring are allowed. It is kept in position by the weights, of which there are four to each post.

Another method of fixing the net on a hard court is shown in Fig. 4, but for this a hole must be made in the ground. Thus done, it gives a thoroughly secure hold. The top of the base is level with the surface of the ground and so offers no projections that will impede the rolling of the court.

With ordinary care a good tennis net will last a long time. The winding arrangement may get out of gear, but usually this is not serious. To take off the strain the net should be lowered after play is finished, never left taut.

TENNIS ELBOW. Strain of the muscles of the forearm below the elbow, often referred to as tennis elbow, is usually treated by strapping the forearm for a short distance with adhesive plaster. It is a painful condition, but does not interfere with



Tennis Court. How to mark out a court; one half only is shown. A B being the place for the net

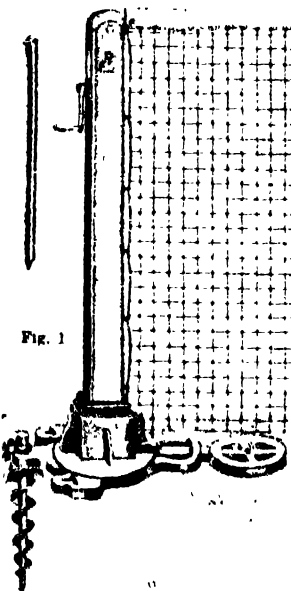


Fig. 1

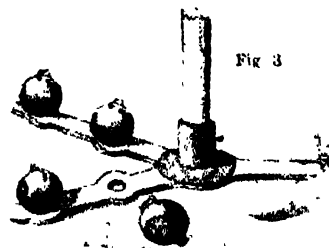


Fig 3

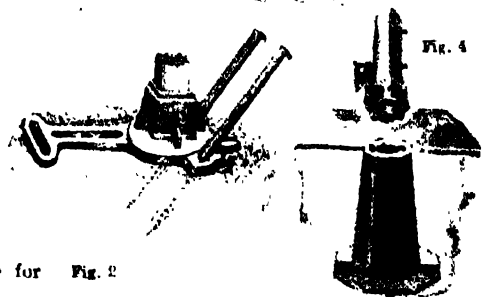


Fig. 4

Fig. 12

Tennis Net. Fig. 1. Square post fitted with patent cone ratchet. Fig. 2. Detail of portable foot. Fig. 3. Post and weights for asphalt and hard courts. Fig. 4. Hard court post with rotary locking device.

(continuation of F H Ayres, Ltd)

the stronger movements of the arm, for example, lifting weights, but movements that call for finer adjustment of the muscles are rendered difficult. It has been suggested that the condition may be induced by the handle of the racquet being too bulky for the grip of the player.

The position of the forearm in the back stroke is likely to expose the parts about the upper joint between the two bones of the forearm to injury, and inflammation may occur in the joint itself. Some doctors advise vigorous massage, while others recommend rest. See Elbow, Strain.

TENON ; In Woodwork. A mortise and tenon joint is employed in all classes of woodwork. The tenon is that part of it which fits into the slot or cavity cut in another piece of material. The tenon can be shaped almost entirely with a hand saw, preferably the type known as the tenon saw. In making a tenon the wood is first prepared to its finished

size and marked out, as in Fig. 1, with a marking gauge and set square. The breadth of the tenon should be about $\frac{1}{4}$ the breadth of the wood. Resting the material on the bench against the bench hook, a cut is made with the saw across the grain of the wood at the shoulder or termination of the tenon. This cut must be very carefully made. If it is even a fraction out of truth or out of square, or not quite perpendicular to the face, a bad joint will result, especially if, as is often the case, it should be impracticable to trim up the shoulder with a paring chisel. A similar cut is made on the opposite side.

After this, the work is preferably set upright in the vice, and two cuts are made with the saw at right angles to the first, and in the direction of the grain, as in Fig. 2. Here again it is imperative that the cuts be made very accurately to the lines marked on the work. The aim should be to saw away the exact amount of wood so

that the tenon can be fitted into the mortise with the minimum of trimming and finishing.

To insure a close fit it is desirable to chisel across the grain of the wood, as in Fig. 3, removing the saw cuts, and generally smoothing the surface. It is usual practice to drive a tenon home with a mallet, but common sense must be employed when doing this, as if the tenon is too tight and driven home too violently, the wood in the vicinity of the mortise will split. The aim should be to make all four sides of the tenon fit snugly against the four walls of the mortise. The example illustrated is the simplest form of tenon. There are many developments of it, according to the nature of the joints which are to be made. The principal forms are described in the article Mortise.

Tenon Saw. For household use the most serviceable size of tenon saw is from 10 to 18 in. long, with about 10 teeth to the inch. The saw blade is reinforced by a backing piece of steel or brass.

The teeth are bent over to the right and left alternately, an arrangement known as the set, which enables the blade to move freely in the slot cut by the teeth. If the set is insufficient, the blade will jam in the slot and probably buckle or distort. It is important to allow for the breadth of the saw kerf, for which reason the wood should be sawn on the waste side of the line and not actually on the line itself.

In use the tenon saw is grasped in the right hand with the right forefinger extended on one side of the handle, and the right thumb on the opposite side. The bulk of the handle is gripped with the second, third, and fourth fingers of the right hand, the first finger and thumb guiding the path of the saw. The blade must be kept perfectly upright with sufficient outward pressure to make the teeth bite into the fibres of the wood. The forward stroke does the cutting; the return stroke brings the saw back without allowing the teeth to rasp the surface of the wood.

A wooden strip should be made to protect the teeth. It is equal in length to the blade of the saw, as shown in Fig. 4, and measures



Tenon. Fig. 1. Marking out tenon before cutting. Fig. 2. Cutting the tenon with a tenon saw. Fig. 3. Finishing the tenon with a chisel. Fig. 4. How a wooden strip is applied to protect the teeth of a tenon saw.

about 7 in. broad and about $\frac{3}{4}$ in. thick. A saw cut is made along one edge for a depth of about $\frac{1}{4}$ in. and when the saw is not in use the strip is laid over the teeth of the saw and

secured in place with a piece of tape. Before putting the saw away, the blade should be wiped over with a greasy rag. See Joint; Mortise; Pergola; Saw.

TENTS FOR HOLIDAY MAKERS

Their Construction and Erection by the Handy Amateur

An article on this subject will be very useful to holiday makers and others who live for a time out of doors, or who for some reason or other may wish to sleep on the open

The main points of utility in tents are the ease with which they can be erected and dismantled, the comparatively light weight of their component parts, and the facility with which they may be packed and transported from one place to another.

They range in size from a small shelter to a huge marquee. Tent trailers, for towing behind a motor car, are dealt with in the article on Motoring.

A simple form of bivouac shelter is shown in Fig. 1. It is constructed by first marking out the intended floor space, and then thrusting a long stick into the ground at each corner. These sticks are lashed together at their upper ends, in pairs, then the ends of the ridge pole, which supports the awnings, are placed in the forks as shown. After the canvas sheet has been placed in position its lower sides are secured to the ground by means of wooden pegs or heavy stones. The open triangular ends may be covered with separate sheets, or canvas flaps, as indicated by the dotted lines in the diagram, could be made and sewn in position.

Although it is simply designed all the features which a good canvas shelter should possess are embodied in the example illustrated in Fig. 2. It will house six adults comfortably, with plenty of room for furniture and stores. The canvas is supported by galvanized wrought iron tubes. The covering fabric is light Willesden canvas, which may be obtained in short or long lengths, the widths

stocked ranging from 2 ft. to 8 ft. Sackcloth may be used, but it is not readily procured in greater widths than 2 ft. The following is a list of the materials required for this tent.

	Long ft. in.	Dia. meter. in.
2 G.W.I. tubes (H)	10 5	1
2 G.W.I. tubes (L)	0 3	1
1 G.W.I. tube (P)	12 23	1
8 G.W.I. tubes (P)	0 6	1
8 G.W.I. tubes (Q)	0 6	1
12 G.W.I. tubes (S)	1 3	1
Galvanized iron wire	4 0	1
Soft iron wire	0 9	1
12 brass eyelets and washers	—	1
8 ditto	—	1
1 iron pipe	3 0	1
1 iron rod	2 0	1

1 length of hardwood, 8 ft. long by 1 in. broad and 1 in. thick.

100 ft. of light Willesden canvas, 5 ft. wide.

2 or 3 skeins of white sewing twine.

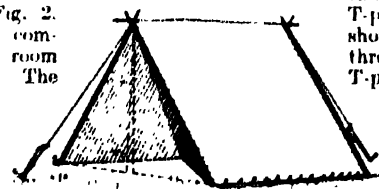
2 or 3 medium sized sackling needles.

1 sewing palm.

54 yards of 1 in. hemp rope.

When purchasing the two tubes H, it is advisable, if the necessary appliances are not available at home, to get a thread cut on one end of each tube and the T-pieces fitted. The tube L should also have both ends threaded to screw into the T-pieces. The bores of each T-piece should be screwed.

The arrangement of the tubes is shown in Fig. 3, their sizes and preparation being detailed in Fig. 4. If the



Tent. Fig. 1. Simple form of bivouac shelter made with sticks and canvas.

centre of the right and left margins on the door-flap. A $\frac{1}{2}$ in. eyelet is inserted into each hole, from the outer side of the flap, and a washer fitted. The stems of the eyelets are expanded with cone punches and finally riveted over on to the washers by light taps from a ball peine hammer.

Each stem must be expanded gradually, first with a $\frac{1}{4}$ in. cone punch, which should be lightly hammered to avoid crushing the stem, then a larger cone punch is used and the stem expanded to its full extent, after which it is riveted over on to the washer. It is often advisable to use three or even four sizes of cone punches in order to expand the metal without fracture. The margin and eyelets to be riveted should rest on a block of wood during the process. An eyelet and washer, and a sectional diagram illustrating how they are fitted, are shown at A and B respectively, in Fig. 19. A special punch set can be procured for this purpose.

After the practice acquired in fitting 2 or 3 eyelets, rapid progress will be made with the remainder. Eleven $\frac{1}{2}$ in. eyelets are riveted in the right side sheet, E, as follows: A space of 3 in. in from the left side is first marked off, then a parallel line is drawn through the point, across the width of the sheet. The points at which the eyelets are to be inserted are marked off on the parallel line, from the measurements given in Fig. 17, then holes are cut and the eyelets fitted and secured in place as previously described. Eleven $\frac{1}{2}$ in. eyelets are fitted in the left side sheet, F, a parallel line 3 in. from the right side being drawn and the positions of the holes marked on it, their spacing being the same as those in sheet E.

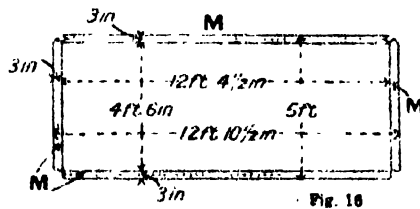


Fig. 16

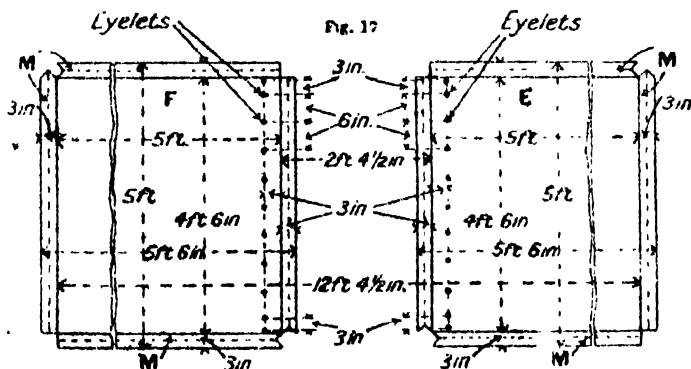


Fig. 17

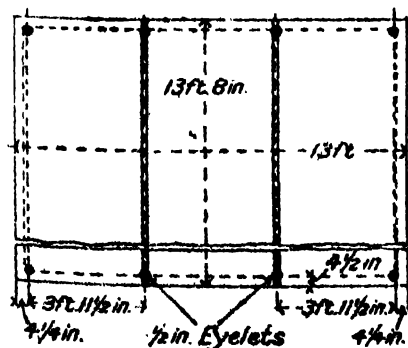


Fig. 18

The next step is to place the right side of the door-flap so that it overlaps the left side of the right side sheet for 3 $\frac{1}{2}$ in., then the upper margin of the flap and the upper margin of the sheet are sewn together where they overlap. The left side of the flap is placed on the right side of the left side sheet and overlapped for 3 $\frac{1}{2}$ in., then the upper margin of the flap is sewn to the upper margin of the sheet, as before. After the door flap has been sewn in position, the width of the door opening should be 2 ft. 4 $\frac{1}{2}$ in., which space, added to the 5 ft. length of each of the side sheets E and F, makes the total length of the front of the tent 12 ft. 4 $\frac{1}{2}$ in.

The diagonal margins on the right gable sheet, B, are folded double, turned inward, and then sewn to the under side of the right side of the roof sheet, as shown in diagram D, Fig. 15, the inner line of each margin being sewn to the line previously marked off 3 $\frac{1}{2}$ in. from the right side of the roof sheet. The upper margin of the side sheet, D, is folded double, turned inward, and sewn to the under side of the roof sheet, as shown in diagram E, Fig. 15, the inner line of the margin being sewn to the line marked off 4 in. from the upper side of the roof sheet.

The upper margins of the side sheets E and F, and the door flap G, are folded double, turned inward, and sewn to the underside of the roof sheet, the inner lines of the margins being sewn to the line marked off 4 in. from the lower side of the roof sheet. A $\frac{1}{2}$ in. eyelet is now riveted in the upper and lower sides of the roof sheet at each of the points shown in Fig. 20. The diagonal margins on the left gable sheet C are folded double, turned inward, and sewn to the underside of the roof sheet, in the same manner as the margins of the right gable sheet.

The sewing having been completed the erection of the tent may now be proceeded with. The ground plan of the tent is first marked out on the site, and a hole 18 in. deep is made at each of the points detailed in Fig. 21. The holes are formed by driving the 3 ft. long by 1 in. diameter iron pipe into

the ground by means of a heavy hammer or maul. (The arrangement of the framework members is shown in Fig. 3.) The ridge tube L is now screwed into the T's on the gable tubes H, then the canvas is folded and stretched flat on the ground, as shown in Fig. 22.

The 3 tubes are next placed inside the canvas, then the lower end of each gable tube is laid at the hole prepared for it in the ground. Two 14 ft. lengths of $\frac{1}{2}$ in. hemp rope are attached to the shackle in each T, then the gable tubes are raised, simultaneously, by two men and erected in the holes. After the gable tubes have been brought perpendicular, the roof sheet is adjusted centrally on the ridge tube, then the side sheets are raised and the tube P fixed in position in the holes prepared for them. The eyelets in the roof sheet are placed on the small projecting tubes in the upper ends of the tubes P, then the side sheets are lowered.

Process of Erecting the Tent

The 12 tubes, S, are now driven into the ground at the points shown in Fig. 3. Each tube should be about 4 ft. 6 in. from the tent, and driven in a sloping direction into the ground. Twelve 8 ft. lengths are cut from the $\frac{1}{2}$ in. hemp rope, to form the guys, V, then a toggle is fitted to each length, as shown in Fig. 23. A firm knot is made on one end of each rope, then a small loop is formed on the other. These loops are placed on the small tubes where they project through the eyelets in the roof sheet. The toggles are adjusted, and the large loops of the ropes placed over the ground tubes, S. A toggle is fitted to each of the ropes previously attached to the shackles in the T's on the gable tubes. The ends of the ropes are knotted, and the toggles adjusted to form the ropes into loops, which are placed on their respective ground tubes, as shown in Fig. 2.

The next step is to tighten up all the guy ropes until the canvas is stretched taut. Two 5 ft. lengths are cut from the $\frac{1}{2}$ in. rope, then one end of a length is inserted into the upper eyelet in the side sheet E, and secured

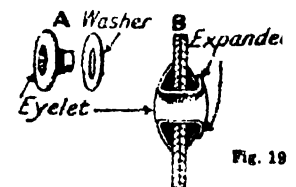


Fig. 19

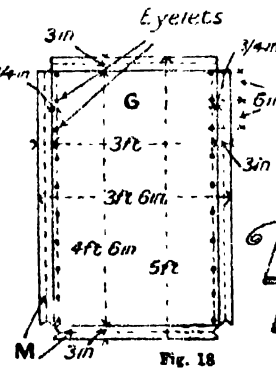


Fig. 18

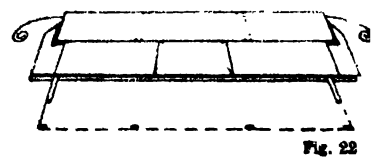


Fig. 22

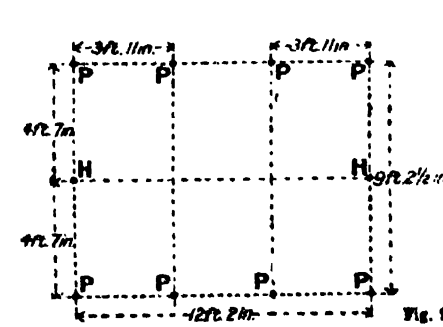


Fig. 21

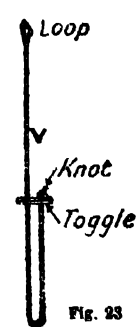


Fig. 23

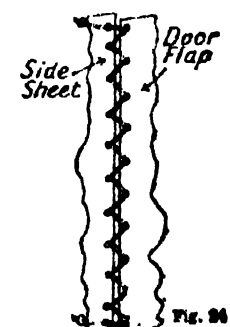


Fig. 24

Tent. Fig. 16. Side sheet. Fig. 17. Two side sheets for forming open side of tent. Fig. 18. Diagram giving measurements of door flap. Fig. 19. Showing fitting of eyelet and washer. Fig. 20. Position of eyelet holes in sides of roof sheet. Fig. 21. Method of marking out ground plan. Fig. 22. Folding canvas and stretching it flat before erecting. Fig. 23. Method of attaching toggle to rope. Fig. 24. How to lace door flap



Terrace. Paved and stepped terrace with its gay flower beds and topiary trees, which forms a charming transition between house and lawn
Hutchinson & Vera Juel

with a knot. One end of the other length is secured in the upper eyelet in the side sheet F. These ropes serve to lace up the door flap when required, both ropes being rove through the eyelets as shown in Fig. 21. After finishing the lacing, the lower end of each rope is secured by a knot made inside the tent, which is now complete.

To dismantle the tent is an easy matter. The guy ropes are first loosened and removed from the ground tubes. The side sheets are then raised and the tubes indicated at P in Fig. 3 are pulled up. Two men next withdraw the gable tubes and lower them to the ground, where they are removed from the canvas and the ridge tube unscrewed.

When choosing a site on which to erect the tent, a place where the ground is level, dry, and sheltered should be selected, and if there are any obstructions, such as stones, roots, etc., they should be removed before marking out the ground plan. After erecting the tent, a shallow runnel must be dug in the ground, at the gables and sides, and connected to drain away rainwater.

During wet weather the guy ropes should be kept slack, as rain causes both them and the canvas to shrink. This precaution should not be neglected, as the shrinkage of the tight guy ropes may strain the roof sheet so greatly that it may cause it to split or tear apart at the seams.

Legal Points. In some districts there are by-laws relating to holiday makers and others who live in camps or caravans. Licences may be obtained from local authorities for the use of land for camping. Persons who do not hold a licence may not allow land to be used for camping for more than a fixed number of days yearly. See Trespass.

TEREBENE. Obtained by distilling a mixture of oil of turpentine and sulphuric acid, terebene is a colourless fluid with an aromatic odour. It is a powerful antiseptic, disinfectant, and deodoriser. Terebene has been used with much success in the treatment of chronic bronchitis. It may be given internally, as an ingredient of cough mixture, or as an inhalation. It is also a good intestinal disinfectant.

TERRACE: In Gardens. A paved, bricked or tiled terrace at the back of the house is a practical and ornamental feature. Where there is no loggia veranda or summer house such a terrace provides the basis for a garden room, easily made with the help of an awning earned down at the sides to form a screen against cold winds. Garden furniture which can be easily moved adds to the attractiveness of the scheme.

When there are somewhat larger grounds a paved or brick terrace makes a delightful transition between house and garden and affords scope for some formal gardening items, such as plants in tubs or vases, an ornamental seat and a lavender hedge. A charming paved and stepped terrace of this type is here illustrated with low brick walls, topiary trees and encroaching clumps of flowers.

The banks and slopes in a garden of suitable extent may be arranged to form terraces of grass, with beds of cultivated plants and bulbs. The incline should not exceed 45°, otherwise the making of beds, stepping, and trimming of grass will be a difficult matter, whilst water will quickly run away, to the detriment of plant roots.

Soil preparation, levelling, and turing should be completed and left to settle down before planting begins. The surface should be a good even depth of sound loam, otherwise

there is the risk of hot weather cracking shallow soil, and grass perishing in consequence. Turves should be cut in thick squares kept flat, and laid from the bottom to the top of the terrace, keeping in place with pegs if necessary. After making them firm with a turf-bender, fill up the spaces with dry powdered clay, and brush the whole with a very stiff brush or besom.

Shrubs, roses, geraniums, fuchsias, bulbs, and similar plants are all effective on a formal terrace slope; or an alpine bank may be constructed. In shady gardens a sloping terrace of hardy native ferns and plants in tubs is attractive. See Awning. Brick. Crazy Paving. Italian Garden. Lawn: Rock Garden; Steps.

TERRA COTTA. This term, which means baked earth, is applied to a class of pottery made of selected coloured clays, which



Terra Cotta. Fig. 2. Statue group designed for a fountain jet by Antonio Rossellino, 1427-1479

produce buff, yellow, and red tints. The red is due to the presence of iron. The surface may be left unglazed, or covered with transparent and coloured glazes. The unglazed ware is porous, and includes butter coolers, bottles used for keeping water cool by evaporation as well as pots for the purpose of admitting air to the roots of plants.

Because of its cleanliness and brightness it is in demand in the form of bricks and tiles for the paving of garden paths, verandahs, halls, and kitchens. Terra cotta jars, ornaments and vases of good design are used effectively in the formal garden. The Doulton works are responsible for good development in modern glazed terra cotta tiles.

An idea of the beauty and antiquity of this clay fabric and its durable quality is gained by a survey of existing specimens in a museum. The example of ancient terra cotta illustrated in Fig. 1 probably dates from some period during the 2nd millennium B.C. The primitive design of the painted and glazed decoration has no connexion with Persian art of subsequent eras, but is quite unimpaired. Excava-



Terra Cotta. Fig. 1. Persian jar in glazed terra cotta, with fantastic paintings in black. It probably dates from some time in the 2nd millennium B.C.

tions of beautiful terra cotta figurines at Tanagra have thrown light on ancient Greek costumes.

Later, beautiful statue groups were executed in Italy by noted sculptors, and an example dating from 15th century is here illustrated. During the Renaissance the vitrified terra cotta enamelled in colours was introduced.

The older English potters employed terra cotta freely for roof-ridges and finials, as well as for chimney-stacks, of which there are some fine Tudor examples. From the Low Countries came later that form of terra cotta with a tin-enamelled glaze which, under the name of Delft ware, gave the first impetus to modern decorated earthenware in Great Britain. Since then British potters have been so fully occupied in perfecting white-bodied ware of all descriptions that they have done little with portable terra cotta beyond making reproductions of Tanagra figurines and other ancient statuettes. With the exception of Della Robbia reproductions, large modern pieces of glazed and coloured terra cotta are for the most part unpleasing and crude in design and colouring. See Delft; Faience; Majolica; Tiles.

TERRIER. Amongst the divisions into which dogs are grouped by the Kennel Club the most numerous is the terrier family. Generally speaking, all these have characteristics in common, such as loyalty to their owners, an irrepressible vivacity, alertness, and fearlessness. Their keep costs little, and they take up no room indoors, being equally at home within the house or outside. In the country they are ready for every sport.

As regards the various companionable qualities, there is little to choose between them, but for protection or as a trusty guard either an Airedale or bull terrier is to be recommended on account of its size, preferably the former. The bull terrier is somewhat headstrong unless carefully trained, and he is scarcely so amenable to discipline as the other. The Kerry blue (q.v.), though lighter, is perhaps too ready for fighting to be a desirable companion for ordinary people. The red Irish terrier is also a reliable protector.

Fox terriers still stand foremost in popular esteem, though the Sealyham has made great headway; he is a dog for the country. The Welsh terrier, somewhat homely in looks, is an excellent companion, besides being cheap. Any of the Scottish varieties can be recommended. The Cairn suits those who want a very small dog that is not a toy. Dandies are lovable little creatures with hearts of gold. See Aberdeen; Cairn; Dog; Fox Terrier; Irish; Kennel; Sealyham; Yorkshire, etc.

TERRINE. The original form of terrine is terrine, a French dish so called from terrine, which means an earthenware pan. This dish was composed of meats, chickens, pigeons and mutton, the meat being cut into portions and the whole baked in earthenware in the oven. Terrine is the name usually applied to the small earthen pot employed for potting foie gras and other savoury potted meats. See Turcin.

TERRY. Turkey towelling is the kind of terry cloth that is most commonly used in the home. Bath robes or dressing gowns can be made at home from this material, which can be bought in plain bright colours and also with coloured patterns. In making bath mats for floors a thick quality should be used, otherwise the mat will not easily remain flat. Terry cloth is also useful for bathroom curtains and for nursery cushion covers.

TESTER: Of a Bedstead. The tester originally described the flat covering of material that was stretched on a frame above one of the bedsteads used in olden times. Soon it was used for the wooden canopy that was fitted on to many bedsteads, and for



Tetrathea. Small pink blossoms of this evergreen indoor shrub, which makes an attractive pot plant.

this reason these are known as tester beds. Tester beds were popular in England during Tudor times. In many the tester is beautifully carved, as are the bulbous turned posts that support it. In most of these bedsteads there are four posts, but in a few the head end is filled in with paneling as far as the underside of the tester, consequently two only are required, these being at the foot end. Sometimes a hiding place was made in the tester. See Bedstead; Tudor Style.

Tetanus. See Lockjaw.

TETANY. In the condition known as tetany spasmodic contractions of the muscles, mostly of the hands and feet, occur from time to time. In children it is associated with rickets, and in adults with disturbance of the digestion. It is treated by giving large doses of calcium chloride and by attention to the general health.

TETRATHECA. This is the name given to a greenhouse evergreen flowering shrub with red or pink flowers during the summer months. It thrives in the usual potting mixture in well drained pots in a sunny position in the greenhouse. Propagation is by cuttings. The necessary temperature averages 50°, and plenty of water is necessary at all times.

TEUCRIUM. The small family of plants known as teucrium consists chiefly of hardy perennials with fragrant sage-like leaves. They are suitable chiefly for the rock or wall garden and are increased by division. T. Chamaedrys has shining leaves and purplish flowers in summer. T. Marum is the cat thyme.

THALIA. This plant may be described as an aquatic perennial, of which only one kind, T. dealbata, is grown. It is a handsome purple-flowered plant for the margins of brooks and ponds, where the position is warm and sheltered. It is hardy if roots are placed deep enough to avoid frost.

THALICTRUM. This is the name of a group of attractive hardy flowering plants with deeply cut, almost fern-like leaves, and popularly called meadow rue. They flourish in ordinary well-drained soil and are increased by division in spring. Those most suitable for the flower border are aquilegfolium, 3 ft., purple; flavum, 3 ft., yellow, and dipterocarpum, 4-5 ft., rosy lavender. Minus, which grows only 12 in. high, has yellow flowers, its variety, adiantum, is commonly called the maidenhair plant, because of the small, fern-like leaves.

THATCHING: THE PROCESS EXPLAINED

Modern Applications of an Old and Attractive Method of Roofing

The reader of this article may with advantage consult the entries that deal with the various types of building, e.g. Barn; Bow; Cottage; House; Summer House; for other forms of Roofing see Roof; Slare; Tiles.

Thatch has much to recommend it as a roof covering. It is warm in winter and cool in summer, and when the thatch has settled down the risk from fire is not serious in country districts. It is not expensive as a roofing, but requires certain skill and ability to perform the thatching of a roof in a satisfactory manner. Thatch is suitable for roofing all manner of garden erections, and it is probably in this direction that the amateur may use it.

Figs. 1 to 3 show the manner in which the present day house is thatched. The thatcher's

tools consist chiefly of the bill hook and a somewhat similar but flatter knife, known as an eaves knife, about 18 in. long. This or a pair of stout sheep shears are used for trimming the eaves. One or two hand rakes with iron teeth are needed, as well as ladders long enough to reach to the ridge of the roof of the building.

Other necessary articles are a supply of pegs, binding cord made of three strand hempen cord, sometimes known as marling, a wooden mallet, and some stout cord with a running



Thatching. Picturesque example of a modern thatched roof on a little country inn.

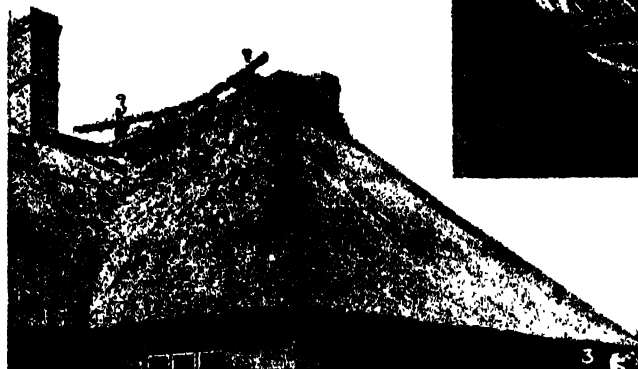
noose to carry the thatching materials from the ground to the roof.

Preparing the Straw. Thatching customs vary in most counties. In Norfolk the spear grass found in the fens is largely employed and is the strongest and best thatching material. In Somerset and Dorset straw is extensively used, and so on with other districts. To begin with the material is made into bundles known as boltings or covings when the material is straw, as threeves when prepared from heather, and as tathous when of reeds. These are delivered to the site, when the roof has been prepared for them, and are unloaded and stacked.

The preparation of the straw is important. Straw of a dry, loose character cannot be packed as tightly and securely as damp straw, for this reason the straw should be well drenched with water and turned over with a fork until it becomes thoroughly moistened. The heap must then be slightly compressed

of fibrous turf over the roof and to push the straw through the turves, while the other is to sew the straw directly to the roof. To prepare the roof for thatching by the first method, the rafters must be fixed on to the roof in the usual manner, wooden battens being nailed on at about 6 in. apart. These battens should be about 3 in. broad. The turves are placed upon the roof, working from the bottom and proceeding in an upward direction as with slates. When cutting the turves a thick curved cutting-iron must be used, so as to obtain turves thick in the centre but gradually tapering off towards the sides. Then, when laid on the roof, the overlapping

alternative, two pieces of wood may be utilized, the boards being cut to the same length as the roof and fixed so as to overlap the thatch for some distance on each side. This method of thatching is, perhaps, more extensively practised than the one above described, as it is often impossible to obtain



Thatching. Fig. 1. Roof prepared by nailing wooden runners to the joists. Fig. 2. Thatching begun by sewing the straw with twine to the runners. Fig. 3. Laying a plated ridge roll, one way of finishing off the apex of the roof.

Courtesy of Boulton & Paul Ltd

by beating with the fork or by treading. The straw should next be drawn from the bottom of the heap where the pressure is greatest. The usual method is to grasp as much straw as can be gripped by both hands held close together. The straw is then drawn out by a quick movement of the arms towards the right, followed by a swing over to the left, finally laying the bunch of straw at the worker's feet with the thicker end to his right hand. This work of yealming, as it is called, is usually undertaken by the thatcher's assistant.

When a sufficient quantity of this partially straight straw has been collected the worker goes through it, using his fingers to regulate it and to remove any loose portions, at the same time drawing the bundle to his feet until the layer amounts to as much as he can hold in the grip of both hands. Great care should be exercised to exclude all short ends and pieces of straw, so that, when properly prepared, the yealm will be perfectly straight.

The yealm of straw must then be gathered in the hands and a small quantity pulled out at one end, turned down and wound round the top of the yealm, forming what is known as a staple. The projection thus formed at the head of this staple prevents it from being withdrawn after it has once been inserted in the turves as described below. A yealm thus formed should never be broken, but kept firm and secure until it is placed in position. As the yealms are completed, they are placed crosswise on a short rope or cord, the thick and the thin ends alternating. When sufficient in number and weight for a man to carry, the rope, which should have a running noose, is drawn round the yealms, which are in this way pulled on to the roof.

Two Methods of Thatching. There are two ways of using straw. One is to lay a covering



edges will make the turf covering level and the roof will be of one thickness throughout.

For laying the staples of straw a thatching iron will be necessary. This implement is slightly forked at the apex in order to catch the twisted head of the staple. In this manner the latter is pushed

through the turf, and is prevented from coming out again by the head of wound straw. The work of laying the staples must be commenced at the eaves, and should proceed upward until the ridge is reached; at this point a layer of turves is placed over the straw in order to form a bolster, or well-defined ridge, and the thatching is then complete. An alternative method of finishing off the ridge is to fix in place a tightly plated straw roll, as shown in Fig. 3.

When preparing the roof for the second method of thatching, namely, sewing the straw directly to the roof, the rafters are laid, the wooden battens nailed on, and the straw prepared in the same way. The straw is then sewn directly to the battens, commencing at the bottom and working upward to the ridge. Sewing twine is used for this purpose, and the work will be found quite a simple operation after a little practice has been obtained. In order to finish off the ridge turves may be requisitioned, as in the former method. As an

alternative, two pieces of wood may be utilized, the boards being cut to the same length as the roof and fixed so as to overlap the thatch for some distance on each side. This method of thatching is, perhaps, more extensively practised than the one above described, as it is often impossible to obtain

firm, fibrous turf. Thatch should overhang the walls to a considerable extent, to allow the drippings to fall clear. Dormer windows, valleys, and hips are all covered in the general run of the work. Separate

gutters are unnecessary, and the cost of a broken roof is thus less than when covered with tiles, which have to be carefully lifted.

Heather and Reeds. In certain districts heather is used extensively in the thatching of dwelling houses, and particularly rustic summer houses and similar buildings. This material is not always procurable in abundant quantities, but in the north and central counties of Scotland it forms the staple medium for thatching purposes. When carefully cut, heather will require but little preparation beyond straightening out. The roof is prepared as in the case of straw thatching by the second method, and the heather sewn fairly tightly and closely together. This makes an excellent and very durable roof.

Reeds, where they are procurable, are also a valuable material for thatching purposes. They are used in a similar manner to straw, being either sewn direct to the roof or inserted through turves. Broom is used in other districts in a similar manner to heather.

On the roof of a dwelling-house, ten bundles, or 5 cwt., of straw will be required to each square of thatch. A square is 100 sq. ft. When thatching is carried out in a thoroughly expert and experienced manner, the roof should remain quite watertight for about 30 years, if composed of the finest quality wheat straw, or for 40 years if reeds are employed. If the work is done indifferently it may not last for more than 10 years. Much of this information is taken from a leaflet issued by the Ministry of Agriculture.



Fig. 3. Thatched roof nearing completion. Note the ornamental finish of the ridge around the chimney stack, and how the thatch overhangs the gable ends of the roof.

Courtesy of Boulton & Paul, Ltd.

THEATRE: HOW TO MAKE A MODEL

Main Principles and Practical Hints for Toy Theatre Construction

This article contains, in outline, the necessary information and materials for simple, inexpensive toy theatre construction, to which the model-maker must apply his own skill and originality

A model theatre can be of value to both the model-maker and to those interested in amateur theatricals (q.v.). It shows, on a small scale, how the stage can be set for a full-sized production, and may therefore be found useful by amateur dramatic societies. The only technical skill needed is proficiency in drawing and water-colouring.

Materials. The essentials are: cardboard of suitably varied thicknesses; stout cartridge paper for the thinner components, such as borders and rows; some good glue and paste; a few water-colours and brushes to paint the scenery and proscenium; a knife, a straight-edge and a few gouges or chisels. Cardboard is supremely important: if badly selected, it often leads to a strained temper and the loss of many hours of work. For general purposes, cardboard of $\frac{1}{8}$ in. thickness, surfaced on both sides, is advisable. It is easily obtained at stationers' stores, but it is as well to have a small supply of various surfaced boards: e.g., a rough wall calls for a rough cardboard, as in a Dungeon Scene, and a wing of foliage demands thinner board or cartridge paper, which is easier for intricate cutting. Knives are preferable to scissors.

Stages of Work. (1) Draw out the scenery, stage components, connecting supports, rails, etc., or detach the ready-made diagrams from the booklet mentioned on next page. (2) Paste all the pieces on to appropriate cards, and put the whole pile under pressure until thoroughly dry. (3) Finish all colouring before cutting. (4) When colour is quite dry, cut out pieces. (5) Build up on the stage plan (i.e. the bird's-eye view of Fig. 1), which consists of the stage frame with proscenium (Fig. 3). (6) Fit first scene (backcloth, Fig. 2, and the additional wings) into the framework, and afterwards try out other scenes you have prepared. (7) Arrange lighting.

General Hints. Ordinary home-made flour and water paste (q.v.) is cheapest and most consistent. Gummed paper as sold in roll (that $\frac{1}{8}$ in. in width is a handy size) is very useful, especially for joining cardboard at corners, and is quite cheap. After pasting press out the pieces with a clean cloth, or better still a photographic squeegee. Care should be taken to press out all air bubbles. Then put the whole pile under pressure, with plain or tissue paper between each piece to prevent oozing pieces from sticking together. A pile of heavy books or some similar weight will make an excellent press, and it is as well to leave the pieces under press for twelve hours.

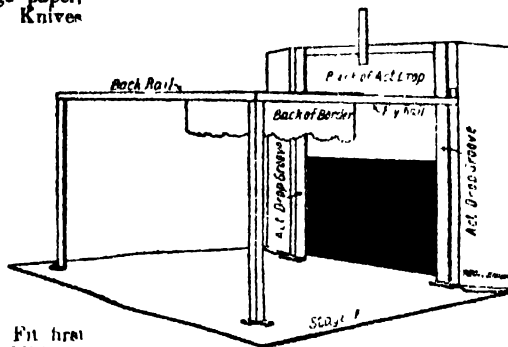
All colouring can be done with tints from an ordinary water-colour box, but if a very large model is made, poster colours are preferable. Imagination must be used but remember that lighting makes a great difference to colours. For the proscenium (Fig. 3) raw umber is suggested for the flat wash and draped curtains. This gives the effect of old gold. Tassels and fringes might be a dull red. The whole effect would be that of a neutral picture-frame for various scenes.

When treating a garden scene (a backcloth for which is seen at Fig. 2), an experiment in colour might be tried and a simple evening effect obtained by using orange for the sky, stronger at the top and gradually getting lighter towards the bottom. Some bright reds and blues would look well in the decorative vases, while for the steps and the little temple a pearly grey, viridian green and rose madder

would be very effective. Any wings used for this scene should be slightly darker in colour as they represent a much nearer distance and so co-operate with the lighting to give the desirable effect of depth. For the wings use a deeper tint of the pearly grey, and the doors and window frames might be picked out with some slight contrast, such as apple green or bright red.

Several stage floors should be made and used appropriately when cut out to fit between the supports. A flat stone-coloured floor for the interior and the dungeon, a yellow ochre tinted paper for the street, a light green for the wood scene, and perhaps a slightly different green to resemble turf for the garden. A yellow ochre strip of path might be a useful addition to the last. All these suggestions might be modified and added to, and thereby the possibility of much instructive amusement.

Cutting should be done on a level surface of three-ply wood or stout cardboard. Study Fig. 1 constantly during cutting and assembling.



hung just over the back of the model. Movable lights are also often ingeniously used. One good method is to use shutters—strips of cardboard—that can be rested on the flyrails across the top of the miniature stage and the resultant shadows give most interesting effects from the diminution of light on parts of the scenery. Another excellent idea is to use screens of coloured translucent paper or gelatine to alter the effect of light in various colours. A strip of white cardboard or tin placed at the base of the proscenium will form a reflector and give much the effect of footlights. Again, lighting from the back of the stage through the cut openings could be tried, and small reflectors can be easily made. Square glass mirrors are very handy for this.

There is no cast, but ingenuity can easily endow the numerous tiny figures and animals, generally sold in toyshops and elsewhere, with suitable characters. Small reproductions of figures and animals can be pasted on card, and a hinged base fixed so that they will stand. Historical costumed figures on cards given with cigarettes make admirable little mummies. Although the figures can only be motionless as far as their limbs are concerned, yet they can be moved from place to place by fixing them to strips and working them from the flies or sides. A better method still is to fix stiff wires to them and work as with marionettes from above. If you have a curtain fixed up behind and around the little theatre the effect to the audience is amazingly good.

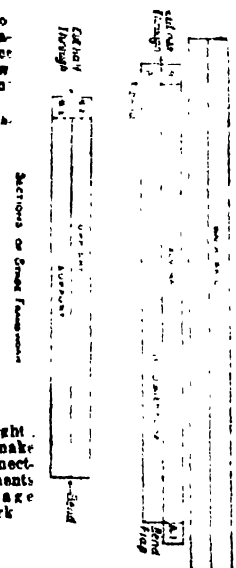
Framework of the Stage. For structural details see the back of the stage (Fig. 1).

Fig. 1 (left). The back of the stage. Keep this diagram by you for reference when assembling. Below Fig. 2 a Garden Scene backcloth from P. Hambro's 'The Model Theatre'.



Courtesy of Studio Ltd.

Fig. 3 (right). How to make various connecting components of the stage framework.



bling and have the connecting strips (prepared as required according to Fig. 4) all ready before assembling. With a knife score down the dotted lines and all places of bending, then bend along a straight-edge. Stick together the tabs and hinge-pieces which should have been left attached to the cut-out scenery and components: glue should be used for securing hinges. Let the completed framework dry before setting a scene.

Lighting. In a scale model all that one can hope to achieve is a rough general lighting effect. Many rooms have electric light that can be utilized by a length of flex and a light that can be

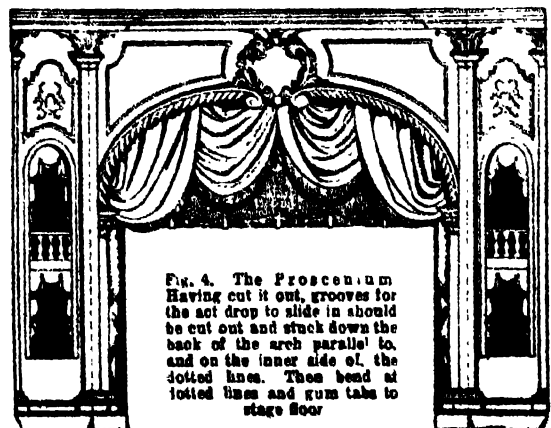


Fig. 4. The Proscenium. Having cut it out, grooves for the act drop to slide in should be cut out and stuck down the back of the arch parallel to, and on the inner side of, the dotted lines. Then bend at dotted lines and gum tabs to stage floor.

Notice the accessories needed. Grooves for the act drop or curtain must be drawn, bent and gummed to the back of the proscenium. Rails and uprights must be cut as required—at least two uprights, two flyrails and one backrail—and gummed to the floor, to the proscenium and to each other, as shown. The flyrails support the backcloths and borders. The act does not vary, and its design should give the eye something to rest and interest it between the acts, without containing elements which might be striking at first, but would irritate with repetition. Leave margins at top and sides when cutting out the drop for sliding into grooves. Gum a tab behind the top for raising and lowering. The backcloth should have a top margin, ending in two tabs to rest on the flyrails.

For further details and ideas, the model theatres exhibited at the Victoria and Albert Museum, London, are well worth a visit, for they are the original models on which scenes for many famous West End plays were afterwards based. Of particular interest is the model setting made as a memento of the production of "The Beggar's Opera" at the Lyric Theatre, Hammersmith (1920). It shows a simple method of scene-changing very suited to the model described above. The backcloth consists of three arches, which remain constant throughout the performance. Behind the arches are light screens or panels which can be changed in a few seconds, giving an entirely new appearance to the whole setting. By using this simple trick, the model maker will be able to effect an astonishing variety of scene changes with the minimum of trouble.

THERAPEUTICS. This aspect of medical art is practised almost unintentionally in home nursing, either pending the doctor's arrival, or with diseases where his attentions are unnecessary. The chief propositions of therapeutics are that any treatment should assist "vis medicatrix nature," the healing power of nature, and should be directed to the patient and not to his disease, and that skill in treatment is more important than method.

In other words, treatment should assist nature. The basis of therapeutics is that the human body itself makes an effort to resist disease and to remain healthy.

THERM: In Gas. The therm is a unit of measurement introduced by the Gas Regulation Act of 1920. A therm is equal to 100,000 British thermal units or B.Th.U., and is the basic unit upon which charges for the supply of gas are made to the consumer by the public gas undertakings. See Gas.

Thermionic Valve. See Valve; Wireless.

THERMOMETER. This instrument is used for measuring heat. One is usually part of a weather glass, this being used to measure the heat of the atmosphere. The heat of the body is measured by a clinical thermometer.

Heat on the thermometer is measured by degrees. There are two scales in ordinary use, Fahrenheit and centigrade; there is also a third method, namely Réaumur, which is not much

used in Great Britain. On the Fahrenheit scale freezing point is 32° and boiling point is 212°. On the centigrade, which is the one most used in scientific circles, freezing point is 0° and boiling point is 100°. On the Réaumur scale, freezing point is 0° and boiling point is 80°.

It is quite easy to convert reading on one scale into the corresponding one for another. For instance, 55° C. is equal to 131° F. This is done by the following formula:

$$\frac{55 \times 180}{100} + 32 = 99 + 32 = 131$$

The formula for the reverse process, i.e. converting Fahrenheit into centigrade, is

$$\frac{(131 - 32) \times 100}{180} = \frac{99 \times 100}{180} = 55$$

Clinical Thermometer. A self-registering instrument known as a clinical thermometer is used in medicine for measuring the temperature of the body. The tube in which the mercury rises is very much constricted just above the mercury bulb, so that when the mercury rises to a certain height in taking a temperature it remains at that height until shaken down. This is what is implied in the term self-registering.

In Great Britain clinical thermometers are graduated according to the Fahrenheit scale, but on the Continent the centigrade scale is adopted. On the former scale the thermometer registers between 95° and 110° and each degree is subdivided into 5 parts, indicated by shorter lines than those denoting degrees. In reading off a temperature the subdivisions are read as decimal fractions, thus one subdivision is .2, two .4, and so on. The normal temperature of the body, 98.4°, is shown by an arrow running across the scale.

Before proceeding to take a temperature the mercury should be brought down 1° or 2° below normal and this is accomplished by grasping the stem firmly with the thumb and index finger and making several forcible flicking movements with the thermometer. There is also a device, here illustrated, for lowering the mercury in the tube by making the case B, containing the instrument, revolve rapidly on the swivelled crosspiece A.

The method of taking the temperature is described under the heading Temperature (q.v.). If there is occasion to use the instrument several times during the day it will be convenient to keep it in some antiseptic lotion in a glass, a piece of cotton wool being placed at the bottom of the glass to minimise the risk of breakage.

THERMOPSIS. These are hardy herbaceous perennials with pea-like flowers in early summer. Montana, 2 ft., yellow, and barbata, 12 in., purplish, are the best kinds. They thrive in ordinary well tilled soil and dislike being disturbed. The best method of propagation for these plants is by seeds.

THERMOS FLASK. This is the patent name of a vacuum flask for retaining liquids in a hot or cold state. The glass vessel can be replaced at a moderate cost if it gets broken, but with ordinary care this should seldom be necessary. The flask should be washed out, drained, and left uncorked when not in use. See Vacuum Flask.

THERMO-SYPHON: Cooling. Nearly all internal combustion engines used on motor vehicles are water-cooled. The thermo siphon method of water circulation makes use of the natural law that a given volume of hot water weighs less than an equal volume of cold water. The water, as it becomes heated in the cylinder jackets, expands and rises, giving place to cooler water entering from below, after passing through the radiator. By suitably arranging the position of the radiator in relation to the engine, the purely automatic circulation of the water through the medium of the radiator keeps the engine at a definite temperature within limits.

Apart from radiator position, there are three points to be considered, namely the capacity of the radiator, the amount of cooling surface, and the diameter of the flow and return pipes. These should be as large as possible, not less than 1½ in. in diameter so as to restrict the passage of the water as little as possible. A fan is usually fitted to force air through the interstices of the radiator, so that the cooling action is to this extent independent of road speed or wind.

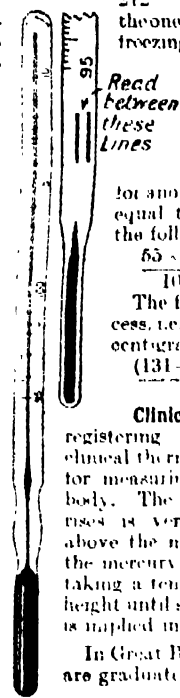
The temperature for a water-cooled engine should be about 200° F. The water should remain somewhere about this figure during the whole time the engine is running. To obtain this result the difference of height between the bottom of the cylinder jacket and the bottom of the radiator is determined by experiment, so that the water, after passing through the radiator, will still be at a fairly high temperature when it again enters the cylinder jackets.

The higher the bottom of the cylinder jacket in relation to the bottom of the radiator, the slower will be the thermo siphon action. If the bottom of the radiator is level with that of the cylinder jacket, the fullest advantage is taken of the system, and therefore the water, as it enters the jackets, will be at a very low temperature. The most effective arrangement is shown at A in the illustration.

If the relative positions are as shown at B the amount of cooling surface is considerably reduced, and the water will still be at a fairly high temperature on entering the cylinder jackets.

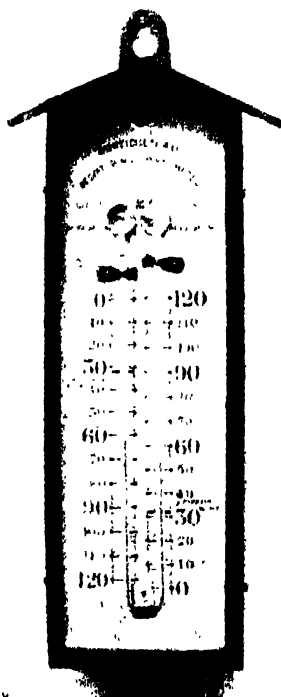
When the front of the vehicle is lifted, as in climbing a steep hill, a varying extra amount of cooling surface is automatically provided, because for the time being the difference of level is increased. This is all to the good, because it comes at a time when in all probability the engine of the vehicle will be working at full output on the low gear. With the radiator placed behind the engine the reverse is the case, which probably accounts for the fact that for this system pump circulation is invariably employed.

Temperature Control. By the incorporation of a thermostat in the thermo-siphon system

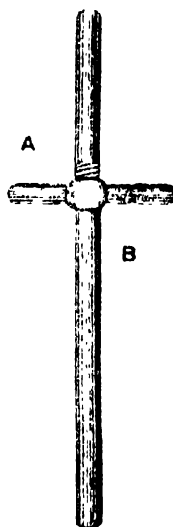


Clinical Thermometer, and diagram showing how to read it correctly

S. Macdonald Ltd.



Thermometer for the greenhouse Courtesy of Negretti & Zambra



Thermometer. Device for re-setting a clinical thermometer

the temperature of the cooling water can be automatically regulated. The thermostat, which is pre-set to the desired degree, opens or shuts a valve which governs the flow of circulating water. An increase in flow brings about an increased cooling effect, and vice versa. Thus the temperature remains approximately uniform, irrespective of vehicle speed or weather conditions. See Motor Car; Pump; Radiator.

THICKENING: In Cookery. A mixture of which flour is the principal ingredient is used to thicken soups and gravies, to convert stock into sauces and for binding outlets and rissoles. It is used also to thicken milk for invalids, 1 oz. flour being used to every pint of milk. The flour is first mixed smoothly with a little cold milk and the whole then boiled for ten minutes.

The most important thickening is roux, both brown and white, which consists of equal proportions of the finest white flour and butter or margarine cooked together until the two are amalgamated.

Roux is fried or baked if brown roux is desired. It is simply stirred over the heat until the flour is incorporated with the fat for white roux. Occasionally a thickening of butter and flour which has not been previously cooked is added to the liquid. It should then be worked together on a plate with a knife.

A more simple method is to mix the flour into a thin paste with cold liquid and stir it into the gravy or sauce to be thickened. This method, however, has a tendency to impoverish the sauce, while the addition of butter or margarine softens and enriches it. Colouring should be added if a brown sauce is required.

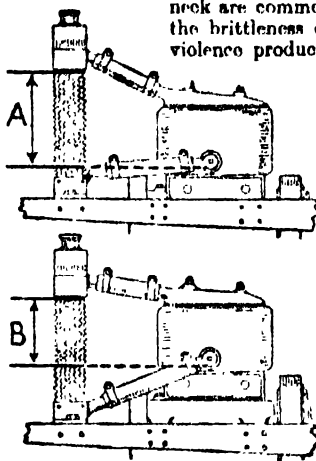
Certain grains, such as crushed tapioca, rice, semolina, or sago, can be used as thickening. The grain should be sprinkled into the liquid while boiling, and it takes from 10 to 15 min. to cook. Pearl barley is used to thicken broths, but must be blanched first and given a much longer period to cook. Arrowroot and cornflour are frequently used in thickening, first mixed with a little cold liquid, and they should be stirred in very gradually.

Eggs can be used to thicken white sauces, soups, and milk, also for custards and light puddings. The eggs should always be thoroughly beaten before being mixed with the liquid, and must never be allowed to reach boiling point, or they will curdle. Eggs worked with sugar make a thick basis for many kinds of cake. Mixed with oil or butter, they form the groundwork of salad dressing.

Lentils and peas when cooked and made into a purée thicken vegetable soups. Haricot beans can also be used for this purpose. Oatmeal is occasionally used as a thickening for soups, but it cannot be strained away, neither does it become absorbed. See Brownings; Flour; Gravy; Sauce; Soup.

THIGH. The thigh bone or femur in man belongs to the class known as long bones, that is to say, it consists of a shaft and two expanded extremities. The head is received in a cup-shaped cavity on the haunch bone, known as the acetabulum, so that a ball and socket joint is formed. The average length of the bone in an adult male is about 18 in. the lower end of the femur articulates at the knee with the tibia. These are possible dangers

of fracture of the thigh: It may affect the upper extremity, especially the neck, the shaft or the lower extremity. Fractures of the neck are common in old people, and owing to the brittleness of the bone through age the violence producing the break may be considerable, perhaps simply from the foot slipping off the kerb. Fractures about the lower end may involve the knee joint and lead to much subsequent stiffness and lessening of movement. The patient will be found lying where he has fallen, and should not be moved till temporary splints have been applied to the part. See Fracture.

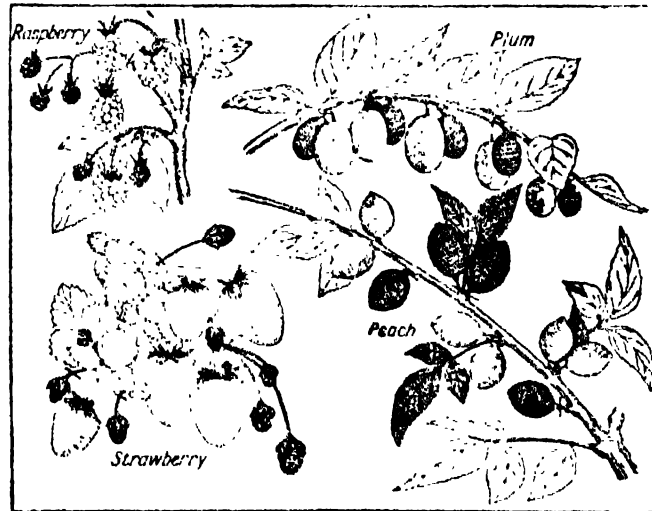


Thermo-siphon. Diagram illustrating principle of thermo-siphon cooling of the internal combustion engine. A and B denote maximum and minimum of cooling surface

THIMBLE. Thimbles are made in gold, silver plated brass, bone, celluloid, etc., and are either plain or decorated around the edge, the top and sides being covered with small indentations to prevent the needle from glancing off it. A thimble should be used that fits the finger well,

as one too small will become painful by the pressure, while one too large will be continually dropping off.

THINNING: In the Garden. When applied to trees and shrubs thinning out means the removal of old and superfluous branches. The term is also applied in gardening to the removal of unwanted seedlings so that those remaining shall have proper room for development. Fruits too must be thinned to allow those left to reach full size. In thinning grapes care should be taken first to cut out all small berries and then those in the centre of the bunch. It should be noted that unless grapes are correctly thinned they will not develop. See Swale.



Thinning Fruit. Shaded portions indicate removals. By special arrangement with Amateur Gardening

THISTLE. The most ornamental thistle for the garden is the cotton thistle or onopordon, tall handsome plants, 6 ft. or more high with pale purplish flower heads. The chief kind is *Onopordon acanthum*, commonly called the Scotch thistle. These thistles are most suitable for the wild garden; they flourish in ordinary soil and are raised from seeds sown out of doors in spring.

THORN APPLE. This group of annual and greenhouse shrubs belongs to the potato family. The botanical name is *Datura* (q.v.)

The common thorn apple (*Datura stramonium*) bearing large prickly fruits sometimes appears as a weed in gardens.

THORNBACK. Being a species of skate, the thornback is a salt-water fish found round the British coasts. It can be cooked in the same way as skate. See Ray; Skate.

THREE-COAT WORK. When plastering brick and stone walls two or three coats may be applied—the rendering or picking-up coat, the floating coat and the setting coat. The first coat is made about $\frac{1}{2}$ in. thick and must take up any unevenness of the wall surface. It consists of "coarse stuff," sometimes hair mortar, and must be roughened before it is dry in order to provide a key for the second coat. This is "fine stuff," similar to the material of the first coat, but with less hair. It is applied from $\frac{1}{2}$ in. to $\frac{1}{4}$ in. thick with a float and must be absolutely plumb. When the floating coat is dry a very thin final coat of the fine stuff made into the consistency of thick cream is smoothed over the surface and left to set hard.

If two coats are considered sufficient ("two-coat work") the first two coats employed in three-coat work, that is, the rendering and floating coats, are mixed to make one coat. See Plaster.

THREAD. It is an economy not only to buy the best quality of thread but to secure the right kind for the purpose in hand.

Domestic sewing cotton consists of six separate strands twisted together to the requisite tightness. No. 24 is a strong coarse thread for buttons, 40 or 50 for hand sewing. For sewing machines thread of 60 or 80 is suitable.

Linen thread is stronger but more uneven than cotton and especially useful for boot buttons, carpets, wing, rug backing, and similar uses. Silk sewing thread is used throughout by the best tailors; for buttonholes which have to take much wear silk buttonhole twist is indispensable. Mercerized cotton can be used for buttonholding but does not give the same satisfaction.

Threads are specially made for crochet, embroidery, knitting, and other forms of fancy work, and experience has taught the manufacturers which numbers are best for particular purposes, and their advice is always valuable as threads are prepared with a view to the needles or hooks with which they are to be employed, and with an eye to appearance. Artificial silk threads are largely used for embroidery as well as for knitting, and they may give trouble unless suitable needles are used. See Crochet; Embroidery; Knitting; Sewing Machine.

Threadworm. See Worms.

Three-ply Wood. See Plywood.

THREE-SPEED GEAR: For Cycles. Variable speed gearing is used on pedal cycles. The mode of operation is through the medium of ratchet teeth and pawls (Sturmev Archer Cycle, etc.).

Fig. 1 shows in part section a three-speed coaster hub for pedal cycles. Although termed

a three-speed gear, actually only two geared speeds are employed, namely, a low speed and a geared-up speed. The middle speed is called normal, meaning direct drive, i.e. the chain ring drives direct to the hub shell by means of ratchet teeth and pawls. Fig. 1 is a detailed drawing in part section of the complete hub. The outer shell that carries the wheel and tire is driven on all three speeds by ratchet teeth and pawls, so that it is possible to coast or free-wheel with any of the speeds.

Fig. 2 is a diagrammatic lay-out of the gears. A is the stationary pinion, B is the floating cage that carries the four planet wheels, and C is the outer internally toothed ring with which the planets are always in engagement; the pinion A is also in constant mesh with the planets. To obtain the low gear the outer ring C becomes the driven member, driving the cage B through the medium of the four planet wheels that are attached to the cage by their bearing pins. These planet wheels are also in engagement with the stationary pinion A, so that as they are rotating the planets will travel in the same direction as the outer ring, but will move more slowly. The final drive is from the cage B to the hub shell D.

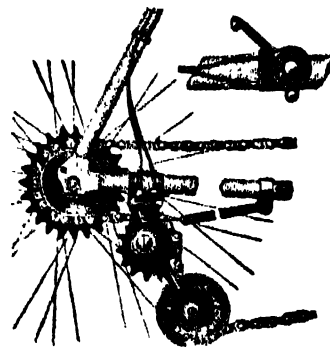
The high or geared-up gear is obtained by a reversal of the foregoing. Fig. 3. The cage B is the driven member, which by rotating causes the four planet wheels, through the medium of the stationary pinion A, to revolve, and these by so doing rotate the outer ring C, but at a greater speed than that of the cage B. In this case the final drive is from the outer ring C to the hub shell D, it being understood that the power applied to the driven member in both cases is through the chain ring shown at M, Fig. 1.

Fig. 4 shows the operation of the low gear. The direction of the drive is transmitted from M to N, then via the ratchet teeth T. They engage with the pawls Q, which are a part of the outer ring C. Then the drive is through the medium of the planets E, that are

also in engagement with the stationary pinion A rotating the cage B, of which the ratchet teeth K are a part, and these teeth engage the cage pawls H, that are a part of the hub shell D, thereby completing the drive. This being the low gear, C, M, and N will be rotating at a greater speed than the hub shell D. Fig. 5 is normal, or direct drive. Through the medium of the chain S and the thrust collar L the cage B with the outer ring C is moved to the right a sufficient distance to disengage the ratchet teeth K from the pawls H. By so doing the pawls F are brought into engagement with the internal ratchet teeth G, that are a part of the hub shell D. The drive is then from M, N through the ratchet and pawl T and Q, thence via the pawl and ratchet F and G to the hub shell D. The drive is now solid, the gear wheels running idle owing to the stationary pinion A.

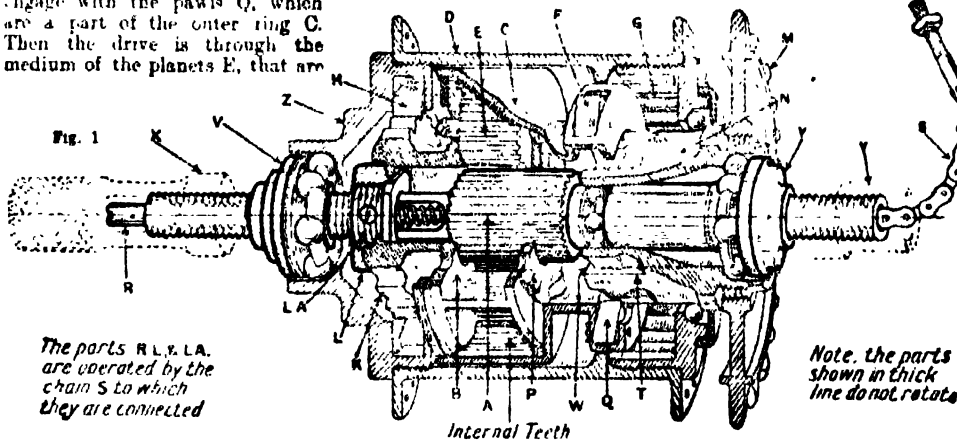
Fig. 6 is the high or geared-up speed. Through the medium of S and the thrust collar L the cage B with the outer ring C is drawn farther still to the right. By so doing the ratchet and pawls T and Q, Fig. 5, are disengaged, and the ratchets P and W take up the drive. The cage B, of which the ratchet teeth P are a part, is the driven member, through the medium of the planets E, which in turn drive the outer ring C. The pawl and ratchet F and G take up the drive to the hub shell D. Diagrams 4, 5 and 6 should be read in conjunction with Fig. 1. The arrangement of the controls is shown in Fig. 7 below.

Derailleur Gears. Another type of variable speed gear is the "Derailleur gear," in which a free wheel with two or more sprockets is employed, the chain being moved from one sprocket to another by a lever-and-cable control on the top tube of the bicycle frame. A tension cog takes up any slackness of the chain between the smallest and largest sprocket. When the control lever is moved, a rotary movement is given to the actuating sprocket so that the sprocket moves laterally into line with the cog selected. There are many variations of this system, giving two, three or four speeds according to the number of sprockets. By combining this type with a hub gear or with a dual chain wheel, 6, 8 or 12 speeds can be devised, and almost any set of gear ratios may be obtained. Regular lubrication is essential.

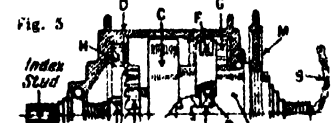


Three-speed Gear. Fig. 8. Derailleur gear, in which a free-wheel with two or more sprockets are used, chain being actuated by a lever-and-cable control. Courtesy of Cycle Gear Service

THREE-WHEELED CAR. The "three-wheel" car is a step between the motor cycle with sidecar combination and the four-wheeled car. An advantage is that in the eyes of the law it is a motor cycle and trailer, and therefore comes under regulations of licensing different from those which apply to a car. The tax on a three-wheeler is £5 per annum, when the unladen weight does not exceed 8 cwt.; otherwise, tax is the same as that of a four-wheeler. Design is simple, and since the back axle with its complicated worm, or bevel and crown wheel, and differential, is eliminated, cost of construction is low. The weight of the completed vehicle



See Fig. 1 for reference letters A, B, C



See Fig. 1 for reference letters A, B



See Fig. 1 for reference letter E

is necessarily somewhat less than the weight of a similar four-wheeled type.

This lightness of weight gives the vehicle a relatively high performance, equalled only by high-powered cars at much greater cost; and it becomes a very fast and relatively powerful car at the price of a motor cycle and sidecar. This is by no means the limit of the appeal of the three-wheeler, for there are on the market several excellent "family models" which give the same accommodation as a small four-seater car with much lower first cost, running

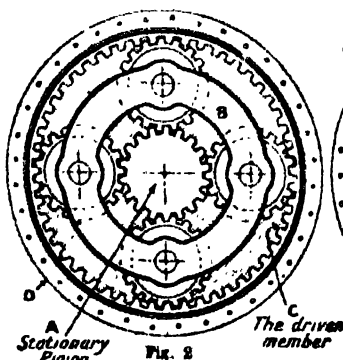


Fig. 2

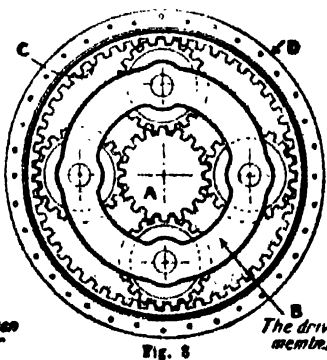


Fig. 3

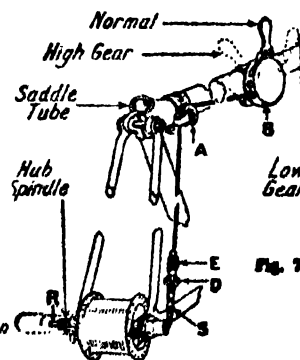
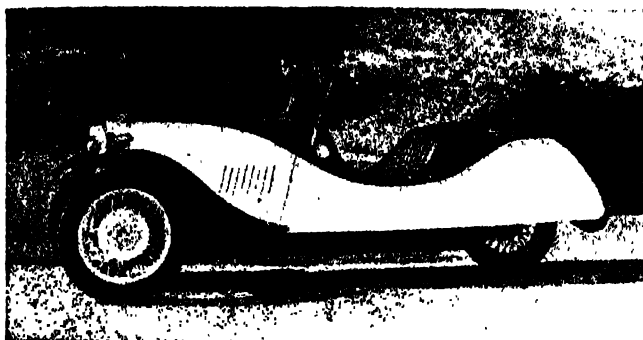


Fig. 7

Three-speed Gear. Fig. 1. Part-sectional drawing of a type of three-speed coaster hub for pedal bicycles. L.A., thrust nut sleeve; E, index stud; V, V, cones; X, Y, sleeve nuts; Z, end cover. Other references explained in text. Fig. 2. Diagrammatic lay-out of the gears, showing position for low gear, outer ring C being the driven member. Fig. 3. Position of gears in high gear, cage B becoming the driven member. Fig. 4. Longitudinal section showing low gear engaged. Fig. 5. Normal or direct drive engaged. Fig. 6. High gear engaged. Fig. 7. Diagram showing arrangement of control units. A, pawl; B, control lever; C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ.



Three-wheeled Car. Morgan three-wheeler, family model
Courtesy of The Motor Cycle

and maintenance costs. Most three-wheelers are driven by a two-cylinder engine of the motor cycle type which drives the back wheel by means of chains, in one design the power is applied direct to the front wheels, thus obviating the use of long chains.

In the Morgan car the power unit is a two-cylinder engine either of the air-cooled or water-cooled type which transmits power to the back wheel by means of a short shaft and chains. There is no gear-box in the accepted sense of the term. From the shaft the drive may be taken at will through either of two chains, which provide different speed ratios. The type of body on this chassis varies from two-seater topcars and four-seater "all weather models" to two-seater "super sports" models capable of over a hundred miles an hour.

The B.S.A. three wheeler is driven by a two cylinder air-cooled engine, but, unlike the Morgan the drive is on the front wheels and not on the single rear wheel. This form of construction is moderately cheap since all the mechanical elements are concentrated at one end of the vehicle.

Various other types of three-wheel vehicles have been introduced from time to time, but have not caught the public fancy, and are no longer made, except the Seal, which is in effect a side-car combination built as one machine instead of two. It is fitted with a two-seater body on car lines.

Theoretically the three-wheeler is not so stable as a four-wheeled car, the relative stability of the two types of vehicle approximating to that of a three-legged stool and the conventional chair, respectively. In practice, however, the disadvantage of a threefold support is not so apparent, and in the hands of an efficient driver the three-wheeler may be reckoned as safe as the four-wheeled car, though it requires greater skill in driving. Motor cyclists probably make the best drivers, since many motor-cycling conditions obtain.

Manufacturers as a rule do not equip a three-wheeler with a reverse gear, and the steering gear is not of the somewhat complicated type used on a car, with the result that steering is perhaps a little more fatiguing. Advantages of the three wheeler include lower weight, greater power in proportion to weight, greater economy in petrol, simplicity of construction, and lower taxation.

A three-wheeler ranks as a motor cycle, therefore the age limit for holding a licence to drive it is sixteen years, instead of seven years, as in the case of a car.

THRIFT. This is the name of a low-growing evergreen tufted plant (armeria)

suitable for the border or rock garden. The commonest is *Armeria vulgaris* (or *maritima*), a favourite edging plant which bears light rose-coloured flowers in summer. *lauchiana* is a variety with blooms of deeper colouring. Sea pink is another name for this plant which grows wild among the rocks by the sea side in the West of England. Two good

taller thrifts suitable for the border are *latifolia* and *plantaginifolia*, 12 in., with rose-coloured blooms. of the improved varieties raised in gardens one of the best is *Bess' Ruby*. *Armeria caespitosa* is a charming low-growing plant with rose-coloured flowers which will thrive in gritty soil in the rock garden.

THRIPS. The small noxious insect pest known as thrips infests the flowers, leaves and shoots of plants, especially those under glass. The leaves become spotted and discoloured. Thrips cause trouble by sucking the juices of the leaves. The best remedy is to spray affected plants with a solution of tobacco water or soft soap. Other effective remedies are quassia extract and paraffin



Three-Wheeled Car. Bond Minicar. This type of three-wheeler most nearly approximates in appearance and comfort to the four-wheeled open car. It is a two-seater and has good luggage accommodation at the rear. The headlamps are faired into the wings and there is a front bumper. Drive is to the front wheel from a two-stroke, 197 c.c. engine.
Courtesy of The Motor Cycle

emulsion, and there are various proprietary insecticides. See Insecticide: Peas; Spraying; Syringe.

THROAT. The space behind the mouth, including the fauces, pharynx and larynx, is called the throat, though the name may also be applied to the front part of the neck. A sore throat, which usually means some degree of inflammatory disturbance, may have many causes. It occurs most frequently, perhaps, in connexion with a common cold, but it may happen also at the beginning or in the course of other infectious diseases. It may also be due to tobacco or some other irritant.

In young children the throat may be sore and there may be little to indicate the fact. For this reason the early stages of diphtheria may be overlooked. It should always be the rule, therefore, to examine the throat of a young child when it is ailing. To do this the child should be held where a good light will shine into the mouth, and the tongue should be depressed with the flat handle of a teaspoon.

A number of methods are available for the application of remedies to a sore throat. Gargling has the disadvantage that the movements made in carrying it out themselves tend further to irritate very sensitive parts. Patients who are old enough to do so may get more good from simply allowing the gargle to lie in contact with the back of the throat for a

minute or two. In acute conditions spraying is better, or the parts may be steamed.

Benefit may be derived from the application of hot or cold compresses to the front of the neck. These are of several thicknesses of flannel or lint, covered with gutta-percha tissue or oiled silk and a bandage. Chronic sore



Thrift. Rose flower heads of the popular sea pink

throat may follow the acute or may result from over use of the voice, dyspepsia and other causes. See Adenoids; Cough; Croup; Crowing; Diphtheria; Eustachian Tube; Gargle; Inhalation; Laryngitis; Larynx; Quinsy; Tonsillitis.

THROATING. This name is often given to a groove cut on the underside of a projecting portion of a building to check the passage of rainwater. When rain falls upon the top surface of the sill it spreads out and flows over the edges; by capillary attraction it flows underneath the sill, and in the absence of a throating groove it continues until it meets the surface of the wall, where it runs partly down the surface. If a groove is cut near the front edge of the under side of the sill, the water gathers there, and by its weight drips from the edge of the groove, thereby keeping the remainder of the sill and the wall dry.

Throatings are not always set in a horizontal position. Examples are found in many windows in a vertical position, both on the moving part and on the framework or fixed part. The purpose in both cases is to act as anti-capillary grooves, which, by collecting the rainwater, provide a channel for it to run down and drain away.

THROATWORT. This handsome greenhouse plant, 2 ft. or so high, bears bunches of light blue flowers in summer. Its botanical



Throatwort. Handsome saffron blue flowers of *Trachelium caeruleum*

name is *Trachelium caeruleum*. It is easily grown in a compost of loam, leaf-mould and sand and is increased by cuttings in late summer or by seeds sown in June. During winter a temperature of 50 degrees is high enough. It is sometimes planted in flower beds for the summer months.

THROMBOSIS. The formation of a clot of blood in the heart or in a blood vessel, usually a vein, is called thrombosis. If thrombosis succeeds in obstructing the flow in a blood vessel, little may happen if the blood is able to move on through other blood vessels, but when it occurs in one of the principal veins of a limb it causes dropsical swelling of the limb, with stiffness and tenderness. The symptoms and consequences of thrombosis depend upon its site. See *Vitrose Vein*.

THROTTLE: In Car and Cycle. With all makes of carburettor the device known as a throttle is used to control the amount of gas entering the cylinder on the induction stroke. There are two types in common use, namely, the butterfly and the piston, the former being the more popular for motor car work and the latter for motor cycles.

The butterfly type is mounted on a small shaft positioned across the centre of the mixing chamber and over the jet. The closed position is capable of fine adjustment for control of the amount of mixture past the pilot jet, used for keeping the engine running very slowly while the vehicle is stationary. The piston type operates by rotary or sliding movement. The amount of throttle opening is graduated, apart from piston movement, by a V-shaped slot cut in the side of the piston, and with the multi-jet carburettors the slot is so shaped that as the throttle opening increases the jets are uncovered in turn.

A proper use of the throttle consists of something more than opening and closing it, according to the engine power required. It is imperative that the speed of the air sucked past the jet should increase as the throttle is opened if a uniform mixture is to be retained. In other words, unless the speed of the engine rises with the throttle opening, the suction on the jet will fall, with the result that the mixture will be relatively weak. Therefore, although the throttle is wide open, the engine will not be giving its full capacity of power.

When the vehicle is climbing a hill and the revolutions of the engine fall off to an appreciable extent, to open the throttle wide will only result in making matters worse. The correct procedure is to change to a lower gear, speed up the engine, and, if the nature of the gradient is suitable, change up again as quickly as possible, at the same time gradually opening the throttle as the speed of the engine increases.

Wear of the bearings of the butterfly throttle, and wear between the piston and cylinder of the piston type, is of considerable importance. Especially is this the case when the engine is running on the pilot jet, because, owing to the throttle being practically closed, air will be drawn in at any possible point, thereby seriously upsetting the mixture. The only cure is to renew the worn parts in the case of the piston throttle, and rebush the bearings of the butterfly pattern.

The speed and power of the internal combustion engine are directly allied to throttle control. Therefore, careful periodical attention should be given to all working parts, from the control lever or pedal down to the throttle arm. Particular attention should be paid to the spring that retains the throttle in the closed position, because, should this come adrift or break, the throttle may assume the full open position, with disastrous results, unless the driver immediately realizes what has happened and switches off the ignition

See *Carburettor: Internal Combustion Engine: Motor Car: Motor Cycle*.

THRUSH: The Bird. A constant inhabitant of the garden where there is a hedge or bushes suitable as a nesting site, the song thrush is not loved by the fruit-grower, although he has a better reputation than the blackbird. In this connexion, it must always be remembered that the thrush feeds mainly upon worms and snails. The persistent manner in which the latter are hunted and destroyed can be demonstrated by placing a large stone in a convenient spot, and noting how the bird uses it for breaking open its prey; the ring of shell debris around it will testify to the thrush's usefulness.

THRUSH: The Disease. In a parasitic inflammation of the mouth, or thrush, whitish patches appear on the tongue, inside of the cheeks, and also on other adjacent parts. The ailment, which usually occurs in infants, is caused by a fungus. The disease is contagious; that is, it may be carried from one child to another through the medium of bottle-teats or spoons.

Mild cases can be cured in 6 to 9 days, the diseased patches coming away and leaving a healthy surface. If the child is sickly and treatment is neglected, the attack may last for months.

Care should be exercised to keep the mouths of children clean, and this is all the more important when they are sickly. The mouth should be cleansed after every meal, so that no remains of food may be left to form acids. In sickness the mouth should be washed 2 or 3 times a day with a weak alkaline lotion, such as lime water, or water in which a little bicarbonate of soda is dissolved, a teaspoonful to $\frac{1}{2}$ pint of water. If the child is hand-fed, the bottle, tubes, teats, and the utensils used for heating the milk should be kept scrupulously clean. The milk must be pure and fresh. Starchy food should be given with the greatest caution before the age of 10 months. If there are any signs of indigestion or acidity of the stomach, add about $\frac{1}{2}$ lime-water to the child's milk.

As soon as the spots appear they are to be treated with any of the following applications: Solution of boric acid, 10 gr. to 1 oz. water; or solution of salicylic acid, 2 gr. to 1 oz. water, or sodium bicarbonate, 12 gr. to 1 oz. water; or permanganate of potassium, 1 gr. to 2 oz. water. Any of these lotions may be applied with a camel-hair brush, or with a piece of boiled lint wrapped round the end of the finger, or they may be sprayed on the patches of thrush.

THRUSH: In Horses. Horses of every kind are liable to thrush of the feet, which is denoted by a discharge of matter, and is generally due to unsanitary conditions in the stable. It is most commonly the horse's hind feet that suffer. Many farm horses get the disease through no drainage being provided. The cobble-stone paved stable is a fruitful cause, unless this has been set in the concrete and is well drained.

The trouble affects the cleft of the foot pad, or frog, as it is called. A frequent cause is through allowing soiled straw, etc., to lodge in the feet, and there remain until it drops out, proper use not being made of the foot picker. The feet should be picked up and cleaned out every time the horse leaves the stable, also whilst it is in the stable. When a horse returns from work it is customary to wash the feet, but care must be taken not to wet the clefts of the frogs and the hollows of the heels.

It is of primary importance to attend to such hygienic matters as a clean dry stable floor, drainage, plenty of straw bedding, and regularity in picking out the feet. Dress the cleft of the frog dry with calomel and pack it

into this by inserting a plodget of tow. This will usually cure it in a few days; but if not, try a lotion consisting of 5 gr. of corrosive sublimate dissolved in 1 oz. of methylated spirit. This dressing, which should be used daily, is applied by pouring it into the cleft, soaking a piece of tow in the solution and packing it into the cleft.

THUMB. The human thumb has a very free range of movement. It may be flexed or bent in on itself, extended or straightened out, adducted or drawn across the palm, adducted or carried out from the band, and opposed or brought across to touch the other fingers. It is characteristic of paralysis of the median nerve that while the thumb may be adducted it cannot be opposed to the other fingers. The part played by the thumb both in performing fine hand movements and in gripping is a very large one, and these functions are seriously impaired in median nerve paralysis.

The ball of the thumb is technically called the thenar eminence. Both this and the hypothenar eminence, the corresponding muscular mass on the inside of the palm, manifest wasting in ulnar nerve paralysis. The thumb is not infrequently dislocated, and great difficulty may be experienced in reducing the dislocation. See *Bandage: Hand*.

THUMB LATCH. This term is used to describe a type of latch which is operated on one side of the door by the thumb. As a general rule it is similar in appearance to that known as a Norfolk latch. See *Latch: Norfolk Latch*.

THUMBPiece. Known also as the purchase, this is often found on jugs or tankards and other drinking vessels that possess a lid, being placed on or near the handle so that the drinker can raise the lid by placing and keeping his thumb thereon. The two main shapes for the purchase were coil-screw and bifurcated. On a tankard of the 17th century the thumbpiece is sometimes a very decorative feature. On one it represents a pierced heart, embossed and chased with flowers, foliage and figures. See *Silver: Tankard*.

THUNBERGIA. This is a pretty climbing plant for a heated greenhouse. The favourite kind is *alata*, of which there are several varieties with blooms of various colours. These plants are very pretty when grown in wire baskets suspended from the greenhouse roof. They bloom in summer and are raised from seeds sown under glass in spring; a compost of loam, leaf-mould, sand, and a little decayed manure suits them.

THUNIA. This is a family of hothouse orchids, about 1 ft. in height, and with white, yellow, or purple flowers in the summer time. They need plenty of heat and sunshine during the growing season, which is from March till October. At this period plenty of water is necessary. During the winter months, 60° is sufficient. Propagation is effected by division of the pseudo-bulbs when the plants are re-potted in early spring. See *Orchid*.

THUYA. This is the botanical name of a group of evergreen conifers; the common name is *Arbor vitae*. They are closely related to the cypress or cupressus and some of them are used to form tall hedges in gardens. One of the most striking kinds is the so-called red cedar (*Thuya plicata* or *Lobbii*) which grows into a large tree. *Thuya dolabrata* from Japan, and *orientalis* from China, are familiar garden trees. There are several ornamental varieties of the Chinese *Arbor vitae* (*orientalis*), e.g. *aurea*, and *glauca* with golden and grey-blue leaves respectively, and of the American *Arbor vitae* (*occidentalis*). These conifers, which should be planted in September-October or in April-May, thrive best in deep loamy soil which does not dry out in summer.

THYME. This fragrant-leaved plant is valued both in the kitchen and in the flower-garden; it likes light or well-drained soil and a sunny place. The wild thyme is *Thymus serpyllum*, 2 in. high, with purplish flowers. This, together with its varieties *coccineus* which has rose-red blooms, the lemon thyme (*citriodorus*), and the grey, woolly-leaved thyme (*lanuginosus*), are delightful little plants for the rock garden and paved paths. The dried shoots of the lemon thyme are used for scent sachets and for perfuming soaps. The common thyme of the kitchen garden is *Thymus vulgaris*.

Uses in Cookery. Thyme is used in cookery for flavouring dishes. It can be raised from seed, by division of old plants, and from cuttings. Seed should be sown out of doors in light soil, in early spring, and cuttings can be taken a little later in the season. The shoots should be collected, tied up in bunches, and suspended in a well-ventilated room or shed to dry. See Bouquet Garni, Herb Garden.

THYROID GLAND. The functions of the thyroid gland, which is situated in the front of the neck just below the Adam's apple, are very important. It has a powerful influence on the nutrition of the tissues of the human body, and on the mental and bodily development. The gland is larger in women than in men, and sometimes reaches an enormous size in goitre. The secretion of the gland contains a certain amount of iodine in organic combination.

The effects of a diminution in the amount of thyroid secretion will depend largely upon the age at which the deficiency arises. If the condition is present from birth and is untreated, there is a complete failure of development both physically and mentally, and the child becomes a dwarf and an idiot of repulsive appearance. (See Cretinism.)

From this extreme instance of complete absence of the thyroid secretion dating from birth, all grades are met with. If the deficiency develops in adult life there will, of course, be no interference with growth, but certain of the features resemble those occurring in cretinism.

Enlargement of the gland is the cause of the disease known as exophthalmic goitre (*q.v.*). Any enlargement of the thyroid gland is known as a goitre (*q.v.*), consequently there are several varieties of goitre. Growths such as cancer may arise in the gland, causing a malignant goitre; or there may be simple non-malignant growths called adenomata. Sometimes inflammation occurs in the thyroid and this condition is then called thyroiditis, which is sometimes difficult to distinguish from cancer. In simple, or colloid, goitre there is no evidence of hyperthyroidism.

Unlike some other endocrine glands, the thyroid secretes only one hormone, viz. thyroxine. This contains about 60 per cent. of iodine, which is its essential component. Almost all the iodine absorbed by the body from the diet finds its way to the thyroid gland. Sufficient thyroxine cannot be manufactured by the gland if iodine is reduced or absent; thus in localities where a natural supply is lacking, e.g. in the water, goitre is a common occurrence, the gland enlarging itself in its efforts to keep up the thyroxine supply without the raw material of which it is composed. Examples of such places are Switzerland and, in England, Derbyshire, whence the popular name "Derbyshire neck" for goitre. These localities are the farthest removed from the sea, where the largest deposits of naturally occurring iodine exist. Iodised table salt, which contains one part in 100,000 of iodine, is now generally used, especially in countries or districts where iodine supplies are lacking in the normal diet.

A substance antagonistic to thyroxine production is thiouracil, a chemical which is used to reduce thyroid secretion where this is excessive (as in exophthalmic goitre). The effect of thiouracil is remarkable; the patient's air of anxious excitement disappears, metabolism slows down, and lost weight is regained.

Stock-breeders have used thiouracil to improve animals raised for meat; animals given the substance use less food for energy and movement, so that more of it goes into store as fat and muscle. Cattle, sheep, pigs, and poultry given thiouracil in their food have attained the same weight as others consuming 25 per cent. more food.

For simple over- or under production of thyroxine, treatment is respectively with thiouracil or thyroxine (or thyroid extract). The former is given for exophthalmic goitre, and the latter for myxoedema and cretinism. For hyperthyroidism, surgical operation for the removal of the gland, or part of it, is sometimes necessary. Radio-active iodine is also given by mouth to destroy the gland partially, and radiation by X-rays has a similar, though less certain, effect. Radiation of the pituitary gland, which manufactures a substance stimulating the thyroid gland, is sometimes necessary.

In all districts where goitre is endemic among humans, the animals of the district suffer also. This applies especially to sheep. The remedy lies in giving the sheep iodised salt.

THYRSACANTHUS. These beautiful hot-house flowering shrubs grow from 2 ft. to 3 ft. in height. They thrive in a mixture of loam, leaf mould, and sand, in a temperature of 60-65 degrees. Propagation is by cuttings of young shoots taken in springtime and inserted in pots of sandy soil. The commonest is *rutilans*, which bears crimson flowers in winter and spring.

TIARELLA. The hardy, perennial herbaceous plant *Tiarella cordifolia* is about 9 in. in height, with white flowers in April. It flourishes in ordinary soil in a sunny or partially shady position in the rock garden or open border. The flowers are borne in masses, suggesting the creamy-white edges of waves; hence the name foam flower. Propagation is by root division in spring.

TIBOUCHINA. Sometimes called the Brazilian spider flower, this is an evergreen



Tiarella cordifolia, a creamy flowered herbaceous plant for a rockery or border

flowering shrub suitable for a heated greenhouse. *Macrantha*, which is the most suitable for amateur cultivation, forms a large bush and bears purple flowers in winter. It should be grown in well drained pots or tubs filled with a mixture of peat, sandy loam, and a little charcoal and sand. It can be trained to trellis, pillars, and walls.

TIC. A muscular twitching of muscles, usually the muscles of expression, is known as tic. It occurs most commonly in young girls. It is treated by re-education in the control of the muscles affected. Mimic tic is a more serious condition which generally occurs after middle life. It is incurable.

TIC DOULOUREUX. This extremely severe form of neuralgia sometimes occurs in the branches of the fifth cranial nerve, also known as the trigeminal nerve. This nerve has three main branches, one supplying sensation to the eyeball and to neighbouring parts, another supplying the region of the upper jaw, and the third the region of the lower jaw. The pain occurs in paroxysms, at first at long intervals perhaps, but later on almost continuously.

Large doses of quinine are sometimes useful, also such drugs as antipyrin and aspirin. But as they have to be used in large doses all such medication should be at the hands of a doctor. The application of warmth, of electricity, of cold, or of anodyne liniments or ointment may afford adequate relief in the mildest cases. Cure, however, can only be secured in one way, and that is by operation. See Neuralgia. Pron. tik-doo-lo-roo.

TICK: On Dogs. This very noxious little pest is sometimes found on dogs, as it is on other animals. In appearance it bears a resemblance, as far as the body is concerned, to a spider, and varies in size from that of a pin's head to that of a small pea. In colour the smaller ones are light grey, but they become dark when gorged with blood.

The tick fastens on the skin, and holds on with such tenacity that an attempt to remove it will often lead to breaking of the insect into two parts, when a nasty sore will usually be left on the affected animal. The insect is found occasionally in the clearest kennels and on the best kept animals, as a dog may have come into contact with one that is infested with it. As soon as ever the tick makes its appearance, steps should be taken to get rid of it. The dog should be treated with one of the preparations that are sold for this purpose, and the treatment should also include the kennel, as the pest often finds a lodging in the woodwork.

If, instead of a kennel, the dog has for its sleeping-quarters a basket lined with an old blanket, sack, or other material, basket and material should be scrubbed thoroughly in hot water containing strong disinfectant. These should then be dried in the sun, or left for some hours exposed to the wind.

TICKING. This very strong linen or cotton material has its chief use in the covering of mattresses, because it is so closely woven that feathers cannot penetrate it. It is usually twilled, and white in colour, with pink, red, or blue stripes. It is also sometimes used for awnings and tents. See Mattress.

TIE BEAM. In building work, the tie beam is the very important member of a king post roof truss or a queen post roof truss, which ties the truss together at the feet of the principal rafters and prevents the truss from spreading.

The tie beam is fixed to the feet of the principal rafters with the aid of long iron bolts and straps, and it is supported in the centre by a gib and cotter. See King Post; Queen Post; Rafter; Roof; Truss.

TIE DYEING. This is a form of fancy home dyeing by which very beautiful multi-coloured effects can be achieved for lampshade silks, scarves, and short curtains. There is no outfit required beyond thread, wax, and a few brushes and dyes.

Jap silk is one of the simplest materials to use, but crêpe-de-Chine and georgette of good quality also yield good results. A little piece of silk is picked up in the middle of the square, circle or strips and tied with thread which has been dipped in wax. The silk is pulled up again and tied $\frac{1}{2}$ in. lower down, repeating this at intervals all over the piece of silk, and tying once only. The material is dipped into lukewarm water, then into a dye-bath. When the string is removed the strangest patterns will be found on the silk. Match-ends dipped in wax and placed on the material to form stars, squares, etc., give many variations.

Small portions of the material may be accordion-pleated, tied up, and dipped in wax. This will preserve them, and when the rest of the material is dyed they will remain the original colour of the material. Where several colours are used the material can be tied at intervals, increasing in size while working outward. Wet the silk, then dip each section into a different colour.

When all the tying is finished the material is spread on a piece of damp newspaper, and a large brush charged with colour is used to tap the top of each little tied-up piece. The brush should be charged quickly and the wet material splashed all over, using first one colour and then another. Light shades should be employed first, as dark ones are very penetrating. A small brush dipped in either black or brown is useful for making thin lines, which give a cobwebby effect. The material should be kept as flat as possible on the paper, and untied as soon as all is coloured. When almost dry it should be ironed out.

Good quality dyes naturally give the best and most permanent results, those sold for Batik being excellent. Fixing acid, acetic acid, or vinegar must be added before dyeing is commenced. See Dyeing.

TIGER FLOWER. This is a brilliantly coloured bulb flower which needs rather special treatment. They should be planted



Tiger Flower. Brilliantly coloured flower of the Peacock type, suitable for a sunny border

3 in. deep in March in a well-drained border of sandy loam in a sheltered sunny place; it is wise to set the bulbs on sand. In autumn they should be lifted and stored in sand for the winter. If grown in pots the bulbs are potted in autumn or winter, placed in a frost-proof frame until top growth appears, and then brought in the greenhouse. Great care

must be taken not to give much water until the bulbs are well rooted.

The peacock tiger iris (*Tigridia pavonia*) is the favourite kind; there are varieties in gorgeous shades of colour. *Conchiflora*, yellow and scarlet, is another handsome sort.

TIGER LILY. *Lilium tigrinum* is one of the best lilies for amateur gardeners. It reaches a height of 4 ft., and bears orange-red flowers in August and September. The bulbs should be planted 5 in. deep in autumn or spring in well dug soil with which leaf-mould and sand have been mixed freely; they may be left undisturbed for years. The finest varieties are *Fortunei giganteum*, and *splendens*, with flower stems 5-6 ft. high and orange-scarlet flowers. See Lily.

TIGER MOTH. This describes the common moth whose caterpillars are known as

woolly bears. The caterpillars feed on flowering plants and vegetables. The parent moths may be identified by their red and black bodies, brown and cream forewings, and hind ones of purple, red, and orange. Destruction of the moths and hand-picking of the caterpillars are the only effectual remedies.

TIGER WARE. This ware was used for a certain type of jug made chiefly in the 16th century, and now much sought by collectors. The ware is a dark, mottled pottery, very hard with a fine glaze, and the jugs are often silver mounted. The style has been much imitated by modern makers. One example, dating from 1559, is mounted with neckband, cover, and foot of silver gilt. The neckband is engraved with foliage and strapwork, and the cover embossed with fluting. The thumbpiece is fruit-shaped.

TILES AND THE PROCESS OF TILING

Protective and Decorative Uses Described and Illustrated

This article is concerned with a number of structural and other matters, both in house and garden, on which there are entries in this Encyclopedia. Such include Bathroom; Bungalow; Cottage; Garage; House; Kitchen; Path; Pool; Sink. See also Concrete; Floor; Mosaic; Pantile; Rubber, etc.

A tile is a comparatively small and thin piece of baked clay, made in substantially the same way as bricks. Such tiles are extensively used for roof coverings, wall surfaces, floors, and other purposes. Glazed earthenware tiles are used where an impervious and cleanly wall covering of a more or less ornamental character is needed, and for fireplaces.

The largest class of tiles consists of those employed for roof covering. Hand-made roofing tiles are noted for their good colour and surface. As a rule they weather better than the machine-made variety. Machine-made tiles are generally harder and more homogeneous, more uniform in colour and texture, and more regular in shape. They are made by processes similar to those used in making bricks, but the material is more carefully graded.

Much of the charm of the small English home is due to the use of the dark red sand-faced tiles. This is especially the case with old tiles, to which time has imparted warm tints often relieved by traces of moss and lichen. Apart, however, from their picturesque appearance, tiles form an extremely durable roofing material; many houses with tiles over 100 years old are as weatherproof as when they were first roofed.

The colour of British tiles ranges from warm reds, browns, and strawberry colours to tints of blue, green, and grey. Among the earliest tiles are those known as pantiles, a flat S shape, averaging about 14 in. in length, 9 in. in width, and $\frac{1}{2}$ in. thick. One edge of the common pantile is turned down rather sharply than the other, and this edge overlaps the flatter edge of the neighbouring tile (Fig. 1). The projecting nib which rests against the roof battens is shown in the section beneath.

A development of the pantile has been evolved by different makers. Some of these tiles are of considerable size, and are flat for the major portion of their area. One edge is sharply upturned, and the other is more or less semi-circular in shape. A roofing tile of the interlocking type is illustrated in Fig. 2. As will be seen by

the section shown, it is moulded so that the overlapping part fits into a grooved portion on the tile beneath it.

By far the greater number of tiles for roofing are of the so-called flat type (plain tiles) illustrated in Figs. 6 to 12. Of these there are many kinds, varying in colour, density, weight and durability. Choice is largely a question of price and effect. The cheapest are a bright red in colour, and machine made. The average size of the plain tile is 10 in. long, 6 $\frac{1}{2}$ in. broad, and about $\frac{1}{2}$ in. thick. On the average, about 650 tiles, weighing 1 $\frac{1}{2}$ tons, are needed to cover a square, that is, 100 sq. ft. of roof area.

Plain tiles are made in three widths, known as half-tile, tile, and tile-and-a-half tile. The two latter are used as end tiles in alternate courses, so as to break the joints, that is to say, so that there should not be a continuous series of vertical joints in the roof covering. In some cases, half-tiles cannot be fixed satisfactorily, and it is customary to use a tile-and-a-half tile, which has the same effect in breaking the run of the joints. The plain tile is rectangular, and there are fancy or shaped varieties for decorative purposes, such as a few courses of bandings or fancy patterns introduced as a variety in a large roof area. Similar tiles employed for covering walls are known as hanging tiles.

The ordinary plain tile is not perfectly flat, but is curved in the direction of its length and across the breadth. Consequently, the upper surface is slightly dome-shaped, which ensures the water draining off the surface. For fixing purposes, tiles are made with small projecting nibs on the top end edge; and two small

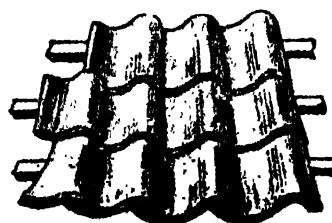


Fig. 1



Fig. 2

Title Fig. 1. Pantiles as laid on battens; below, section of a pantile showing nib which catches on battens. Fig. 2. Interlocking flat tile; below, section of three tiles

holes through the tile near the top edge for nailing if required. To support the tiles, horizontal battens are nailed at regular intervals to the roof rafters. In preparing an estimate for tiles for roofing purposes, it is necessary to ascertain the area in terms of squares of 100 ft. superficial. The first thing required is to ascertain the approximate number of tiles that will cover a square. Allowance must be

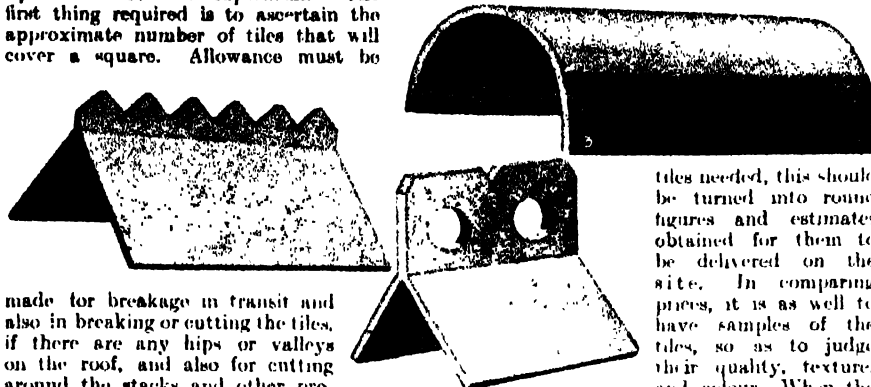
ordinary tiles are laid continuously, in the manner shown at Fig. 6, or the valley may be constructed with valley tiles, one being allowed for each course. Alternatively, lead or other guttering may be provided for the purpose. Having ascertained the quantity of

long. Some mortar must be in readiness, and should be spread over the tops of the eaves tiles before fixing the first course, so that the latter is bedded in mortar.

After the first few tiles of the first course have been laid, a tile-and-a-half tile is set on the second course, commencing from the verge as before, and bedded in mortar. The tile is gently tapped down so that it rests firmly on the tile beneath it, by lightly tapping upon it with the end of the trowel handle, as in Fig. 8. Several more ordinary tiles are then laid on the second course, but these will not need to be bedded in mortar. The third course is commenced, the first tile being bedded in mortar and the edges brought up level with those beneath it. The next course is then continued, and the work goes forward, gradually working along and up the roof until the ridge is reached.

To save labour and the time of constantly clambering on and off the roof, an assistant can stack the tiles by resting them between the battens with others at right angles to them, as shown in Fig. 9. Thus the tiles are supplied constantly with tiles, conveniently placed.

It is desirable in exposed positions to nail about every fourth course by driving 14 in.



Tile, Fig. 3. Common ridge. Fig. 4. Serrated ridge. Fig. 5. Decorated ridge tile

made for breakage in transit and also in breaking or cutting the tiles, if there are any hips or valleys on the roof, and also for cutting around the stacks and other projections. A reasonable allowance for these various purposes is 5 per cent.

A sufficient quantity of half-tiles or tile-and-a-half tiles must be provided, the number depending upon the courses on the roof and the verges or ends, reckoning one tile-and-a-half tile or one half-tile per alternate course. To determine the number of courses of tiles, it is necessary to know the distance from the ridge to the eaves and also the lap or gauge of the tiles. The lap varies from 2½ in. to 4 in., and an average of 3 in. gauge can be taken as reasonable, so that there will be four tiles per foot of length of the distance from ridge to eaves.

In addition, there are special tiles made for the top or ridge of the roof, varying from the plain ridge tile, which is semicircular in section, as in Fig. 3, to those of ornate pattern, such as Figs. 4-5. Ridge tiles measure about 12 in. in length, and are laid so that they butt up against each other. The proper number needed for the job is easily ascertained by measuring the length of the ridge. If the roof is hipped, the junction between

tiles needed, this should be turned into round figures and estimates obtained for them to be delivered on the site. In comparing prices, it is as well to have samples of the tiles, so as to judge their quality, texture, and colour. When the choice has been made and the tiles received, they should be unloaded and stacked on a level piece of ground conveniently near to the scene of operations.

The first step in the actual laying of the tiles is to have the roof prepared for their reception. They can be laid directly on to the battens, or the roof may be covered with rough boarding with tarred felt over it, and battens upon which to set the tiles. The battens must be perfectly horizontal and laid at the proper distance or gauge from each other. The meaning of the expressions lap and gauge, as applied to plain roofing tiles, is made clear by the diagram, Fig. 7. From this it will be seen that the gauge is the distance between the top edges of two battens and the lap is the amount by which one tile overlaps the tile on a course next but one below it.

For complete protection, it is necessary that at any given point there should be three tiles. The roof remains weathertight not because the surface is sloping, but because the tiles overlap each other. Owing to the triple lap, any water that penetrates the outer layer of tiles will be deflected by the lower layers.

Ordinary tiling is commenced at the eaves, and preferably at the right hand end or verge. A scaffolding is required, and it should be placed so that the worker stands about 2 ft. 6 in. from the eaves line. The first steps to lay the eaves course, made of special tiles, which are about three quarters of the length of the ordinary tiles.

These are inclined at a different angle to the rest of the roof, rather flatter than the remaining courses so as to tilt up the lowest course, this tending to make the roof drier. A few are laid as a start.

The next step is to commence laying the first course whose lower edges coincide with those of the eaves course (Fig. 8). These are rested with their ribs on the upper edge of the batten, and the first few tiles may be further secured by means of galvanized iron nails, about 1½ in.



Tile, Fig. 8. Setting the tile-and-a-half tile for the start of the second course

galvanized iron nails through the holes in the tiles. It is not necessary to nail every tile except in very exposed districts. If half-tiles are used instead of a tile-and-a-half tile, they are set in place in exactly the same way. Should there not be enough of these, ordinary plain tiles can be cut in half by scoring a line along the centre and cutting them with a sharp blow from the edge of the trowel, cutting downward rather than across the tile.

The appearance of the verge or end of the roof when it is completed is shown in Fig. 10, which also indicates a simple method of finishing the tiles around a chimney stack with strong cement mortar applied round the sides of the stack and on top of the tiles. This is not necessary when flashings are fitted, as these come on the tops of the tiles and keep out the wet.

The ridge tiles are set on the apex of the roof and are merely bedded in strong cement mortar. Hip and valley tiles are worked where requisite at the juncture between roofs which meet at an angle. In another method a valley gutter is often formed with lead set upon valley boards, and the tile courses terminated with the tiles cut diagonally. A detail of this class of work is illustrated in Fig. 11. To support the tiles where they overlap the gutter a continuous batten or ridging is necessary to raise them above the surface of the gutter. Usually, however, the valleys should be worked

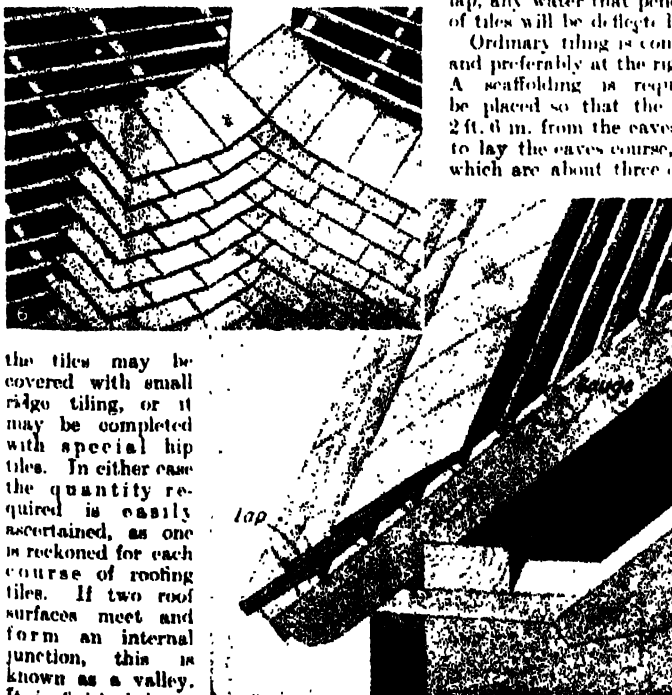


Fig. 6. Leaved valley laid with ordinary tiles. Fig. 7. How tiles are laid, illustrating the meaning of the terms lap and gauge

the tiles may be covered with small ridge tiling, or it may be completed with special hip tiles. In either case the quantity required is easily ascertained, as one is reckoned for each course of roofing tiles. If two roof surfaces meet and form an internal junction, this is known as a valley. It is finished by a method known as lacing, in which

with the proper valley tiles which course and bond with the plain tiling, or the tiles may be swept and laced, as illustrated in Fig. 6. A valley board about 9 in. wide is laid up the valley, and the tile courses are continued from the two intersecting slopes of the roof, so that each tile on the main part of the roof overlaps a tile on the subsidiary part. Alternatively, the courses from each slope may be taken over and under in alternate courses. The last tile of every course, of which only the corner will show, is preferably a tile-and-a-half tile. Tiles can only be laid in this way when one roof is subsidiary to the other, otherwise the ridge line will be broken.

At the verges, the finishing may be by clostiling, that is, the tiles project only from 2 in. to 3 in. beyond the gable wall, and are given a slight inward tilt to throw water away from the edge. Alternatively a projecting verge and a barge-board can be adopted, the ends of the tile courses being pointed with strong cement mortar.

Tile Hung Walls. Vertical tile hanging is a method of covering the surfaces of walls in exposed positions, and it forms an excellent protection. The method is shown in Fig. 12. The groundwork is often composed of horizontal battens of wood nailed to the brickwork. The objection to such a plan is that the timber is liable to rot and decay, but it is often the only practical plan. The tiles are hung on ribs and each is separately nailed. The

bolts and grooves are overlapped, the gauge being about $\frac{1}{4}$ in.

Doubling courses of tiles are used under the roof eaves, and also on the lower courses, and above any openings. The tiles are given a considerable local upward tilt, as in Fig. 12 to throw the drops of water clear of the window sill or opening beneath it. Fig. 13 depicts a small cottage tile-hung with dark red sand-faced tiles of ornamental pattern. A method known as Winchester underhang is illustrated on page 1007.

Ordinary plain tile roofs should have a pitch of about 45° to $47\frac{1}{2}^{\circ}$, and be rather steeper in exposed positions. Apart from the tiles already mentioned there are others specially shaped and adapted for particular purposes. Glass tiles are built into a roof to help to light the interior, and there are various fancy shaped and special purpose tiles.

The repair of tiled roofs usually consists of raising the tiles in the vicinity of those which are damaged, pushing them upward and lifting them over the batten, replacing them in a similar manner with new tiles. In all such roof repairs the use of a proper roof board or some adequate method of protecting the tiles from breakage is of paramount importance, otherwise more damage is likely to be caused. One plan is to rest a light ladder upon two large sacks filled with straw. These are beaten down comparatively flat before they are rested on the roof, and



Fig. 13. Attractive effect of a cottage tile-hung with dark red sand-faced tiles of an ornamental pattern.

act as a soft pad between ladder and the tiles. The amateur should attempt only the simplest replacements (e.g. to a low roof such as that of an outbuilding). The builder uses a special "duck" ladder which is securely fastened at top and bottom. Apart from the likelihood of the amateur damaging the sound part of the roof, there is considerable personal risk in work carried out on a high roof.

Decorative Tiles. With the advance of hygienic wisdom in the home glazed tiling for kitchen, scullery and larder is becoming more general. Though other suitable mural coverings are somewhat less expensive, tiles are worth the extra cost where durability, cleanliness and labour-saving are the first considerations. Also they do not depreciate in wear. The advantages of tiles in the bathroom are obvious and the scheme is sometimes completed by a tiled floor. Where paint is used for the walls, inset tiles form an excellent splash back for the bath and lavatory basin.

British glazed tiles are unequalled in quality, colour and designs. Fine decorative mural tiles are made of glass as well as of clay. The glass has a matt surface, is semi-opaque and can be obtained either stained in plain colours or painted with pictorial designs. Use is made of these for inset borders and wall panels.

The depth of the glaze of earthenware tiles varies with the style of the design. In some cases this is in relief, in others it is painted, while a third class of tile depends for beauty only on its fine monochrome glaze. In choosing tiles for a hearth and fireplace, should a pictorial pattern be required, only good designs should be considered, as cheap ones are unpleasant to live with and plain tiles of harmonious colouring are preferable.

These tiles are generally small and square, varying from 3 to 6 in. in size. They are laid in a similar manner to flooring tiles on a concrete bed with plaster or mortar. Generally when a tiled fireplace is purchased a hearth is laid to match, and tiled curbs are obtainable.

Simple Tiled Work. If it is only desired to half-tile a wall, the joint between tiles and plaster wall face is made with a simple wooden moulding. A tiled sink back is invaluable in the kitchen of a small flat. Tiles of a suitable character can be obtained from the better-class ironmongers and may be set in place against the wall with a good backing of plaster, especially when the tiles will fit



Fig. 9. Showing how to stack tiles on rafters ready for use. Fig. 10. Verge with tiles in place and cement fillet around chimney stack. Fig. 11. Tiles cut to form simple valley gutter. Fig. 12. Showing how lowest courses of tiles on a tile-hung wall should be tiled.

under a window ledge. A proper key must be provided to the brickwork of the wall, as described in the articles on Cement and Rendering. To avoid the difficulty of cutting the tiles to the slope of the draining board, the latter can be removed, cut back a little, and refixed. The joint between the sink top and the tiles is preferably made with strong Portland cement mortar. The tiling of large areas is hardly a job for the home worker, and the services of an experienced workman should be obtained for this.

Tile Paper. This term is used to describe wallpaper the surface of which is printed to represent tiling. See Wallpaper.

TILLANDSIA. These are hothouse evergreen plants with large, strap-shaped, green or coloured leaves and coloured bracts. They flourish in pots in a well-drained compost of loam, with which sand and broken brick are mixed, and are propagated by detaching and potting the suckers or offshoots in spring. Linden and splendens are two of the best sorts.

TIMBALE: In Cookery. Rich and savoury mixtures of meat or fish, such as scallops of chicken, small birds, game, lobster or oysters may be served in the ornamental case known as a timbale. The case may be composed of macaroni, spaghetti, or even of aspic, but the shape is invariably round and it is usually cooked in a special mould.

For a macaroni case the large variety should be used. This must be boiled with stock and then cut into 1 in. lengths. A plain buttered, round, 11 with a rounded top should be used, and the pieces of macaroni so arranged that they line the whole inside of the mould standing on end. Over these a layer of forcemeat is placed, and the surface of this is smoothed with a knife dipped in hot water. The forcemeat is necessary to prevent the portions of macaroni from slipping. The mould is then filled up with a savoury mixture and steamed.

Any mixture of cold meat, game or poultry is suitable for filling the timbale. The proportions are as follows: $\frac{1}{2}$ lb. cold cooked meat, chopped small, 2 oz. white bread crumbs, 1 oz. dripping, 2 eggs, 1 dessert-spoonful chopped onion, half teaspoonful stock, 2 teaspoonfuls chopped parsley, $\frac{1}{2}$ pint brown sauce, and salt and pepper.

Melt the dripping in a saucepan, add the onion, and fry lightly then remove it and mix with the meat, crumbs, and parsley. Beat the eggs, add the stock, stir into the rest of the ingredients, season well, and be sure that all the ingredients are mixed smoothly and evenly. Put the mixture, a little at a time, carefully into the lined mould, and press in gently but firmly. Twist a piece of greased paper over the top, and steam the timbale for half an hour.

Take off the paper, and turn out the timbale carefully on to a hot dish, and strain the hot brown sauce around it.

Beef Timbales. Timbales made from spaghetti and cooked beef can be prepared thus. Break 2 oz. spaghetti into small pieces, wash it, and then cook it in a pan of boiling water until it is tender. Grease some small, plain moulds, and line the sides and bottoms with some of the strained spaghetti, pressing it well to make it adhere. Then fry a peeled and chopped onion and a chopped mushroom in 2 oz. dripping. Mince 8 oz. cooked beef previously freed from skin and bone, and add to it 3 tablespoonfuls bread crumbs, 1 teaspoonful chopped parsley, the cooked onion and mushroom. Mix well, add salt and pepper to taste, about $\frac{1}{2}$ gill brown gravy, and a beaten egg. Put the mixture into the prepared moulds, cover it with the remainder of the spaghetti and tie a greased paper over each. Steam the timbales for about 30 min. and, when they are almost cooked, fry 4 tablespoonfuls freshly cooked or bottled runner

beans in 2 oz. dripping. Turn out the timbales carefully on to a hot dish, pour a gill of hot brown gravy round them, and use the beans as a garnish.

Fish Timbales. These are usually made with an aspic case. Turbot, halibut, or any firm white fish may be used. Salmon, also is good in a timbale. To make, pound some of the cold cooked fish with enough stiffened white sauce to moisten it, adding seasoning to taste, then line the inside of a large timbale mould with some melted aspic jelly. When it has set, mask it with the pounded fish and fill up the centre with some flaked fish, also moistened with white sauce to which has been added some cream and a little piquant flavouring. Put a layer of the pounded fish on top, and leave the whole to set. When quite firm, turn it out of the mould on to a dish and garnish it with chopped jelly and salad.

TIMBER. The trunk and larger limbs of trees are usually known as timber after they have been felled and stripped of the outer covering of bark. Timber trees are those which can be used for general building or wood working purposes, and they are classified into two groups, conifers and broad-leaf trees. Examples of the former class are northern pine, producing yellow deal, *Pinus strobus*, producing yellow pine, *Pinus europaea* or larch, and *Pinus rigida* or pitch pine. Of the latter class, oak, ash, lime, and beech are examples. There is also a sub-division into hard and soft woods.

Timber trees which have reached maturity are felled during the autumn and winter, when the sap is more or less dormant. The timber has then to be seasoned, during which process it shrinks and dries, it is then converted to suitable sizes, and further seasoned prior to use. The newly felled tree is called a log, when trimmed it is known as a balk. When sawn, the various sizes are known as deal, plank, board, battens, scantling, and quartering. See Beech, Gum, Mahogany, Oak; Pine; Wood, etc.

TIMING: For Engine Speed. The power which is developed by any type of internal combustion engine will depend entirely upon the correct timing of the valves and the ignition, assuming that the compression, carburation, and sparking plugs are in order.

To deal first with the valves, there are four phases in the cycle of their operation, namely, induction, compression, explosion or power stroke, and exhaust. Not less than two valves per cylinder are required, one controlling the inlet of the fresh gases, the other the exit of the burnt gases, these are known respectively as inlet and exhaust valves. They are timed through the medium of the camshaft to open and close at the exact moment of piston position.

The greater the speed of the engine the earlier must the inlet valve open, and remain at its full open position until the piston has just started on the up stroke. The object of this is to give the gases the maximum of time in which to enter the cylinder. Owing to the continuity of direction or flow of the gases, the fact that the crankshaft has just passed the bottom dead centre and is about to start the piston on the up stroke is not felt by the gases until well

after the inlet valve has closed, thus allowing the compression stroke to take place.

Meantime the exhaust valve is closed, and it remains closed until the piston has descended to within approximately $\frac{1}{4}$ in. from the bottom of the power stroke at which point it opens, and does not again close until just before the top of the stroke is reached. This period is termed the exhaust stroke. Immediately the exhaust valve closes, the inlet valve opens. Sometimes the timing of the valves overlaps, i.e. the inlet valve opens just before the exhaust valve closes. Especially is this the case with the high speed engine, such as is used in sports models and racing cars.

The special timing diagram issued by the makers of the engine should be strictly adhered to. Timing gears being positively driven and contained within the crankcase are lubricated by ducts connected with the oil system and protected from any chance of damage other than a fracture of the parts involved.

Before dismantling a timing gear the setting should always be noted carefully. In most cases marks will be found at the root of a tooth of one wheel that denote its position in relation to corresponding marks on the wheel with which it is in engagement. These marks should be brought together and a reference made of piston position, i.e. make absolutely certain whether the timing is marked for the commencement of the inlet stroke or the exhaust stroke, as makers are not all in agreement on this point.

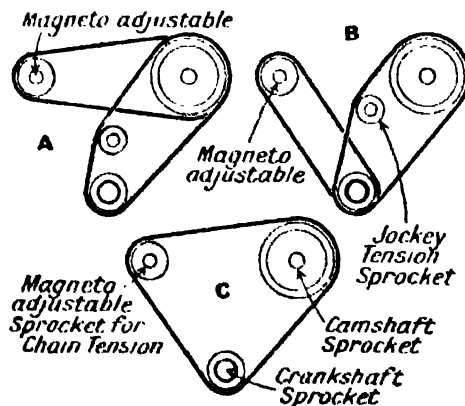
Accuracy in re-assembly is essential of untoward consequences due to bad timing are to be avoided. If the amateur is not confident of his ability to re-time correctly, he will do well advised to employ expert help.

With multi-cylinder engines the periphery of the flywheel is sometimes marked to show the top and bottom dead centre of the crankshaft, with adjacent marks reading inlet and exhaust, to show the point at which the respective valves open.

Timing Gear. All timing gears for four-stroke engines have a two to one reduction, i.e. the crankshaft makes two complete revolutions to one revolution of the camshaft. The former drives. The two types of timing gear in common use are the spur cogwheel drive and the silent chain drive. The silent chain drive may be carried out in three ways as shown in Fig. 1. The simplest arrangement is that depicted at C, one chain embracing the three-sprocket wheels, by varying the position of the magneto sprocket, which is fitted on a separate bracket, the whole of the gear is adjusted.

The arrangement shown at A employs two chains. The magneto chain can be adjusted by the means described for C, but it is only possible to keep the camshaft chain at a uniform tension by fitting a spring loaded jockey sprocket wheel, as shown. In most cases where two separate chains are employed, the arrangement is as shown at B, with the chain adjustment the same as at A.

The gear wheel design of timing gear is commonly employed for multi-cylinder car engines is shown at A (Fig. 2). With a view to silence in operation, skew or helical gears are frequently used, and very often the large wheel which drives the camshaft is formed of vulcanized fibre, supported on both sides by a disk of phosphor bronze. The timing



Timing. Fig. 1. Showing diagrammatically some examples of chain driven timing gears

gear for the overhead valve is often identical in principle with long tappet rods, but fitted to connect from the cams to the overhead rocker arms. An alternative arrangement is the positioning of the camshaft as a part of the detachable head, i.e. the detachable head valves, rocker arms, and camshaft form a complete unit. With this arrangement the drive to the camshaft is either by silent

chain or some form of toothed wheel drive, transmitted to the camshaft by means of a vertical shaft that in turn is driven off the crankshaft. Since the timing gear is disturbed each time the cylinder head is removed in the process of decarbonizing the engine, careful note should be made of the timing marks on the wheels.

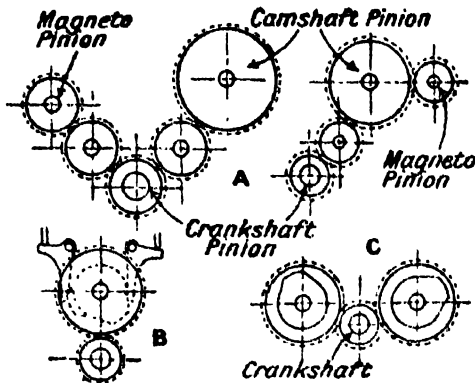
Sometimes the camshaft is connected to the drive of the vertical shaft by means of a disk coupling that is provided with a location stud, thus ensuring the correct timing of the valves when re-assembling the unit. With this design the removal of the detachable head in no way interferes with the timing gear.

Timing the Spark. Of equal importance is the timing of the ignition, whether it be by magneto or by the coil and distributor method. The two systems in common use are known as the fixed and the variable. With the former the spark should be set to occur just before the piston reaches the top of its stroke. By this arrangement the crankshaft has crossed the top dead centre before the full force of the explosion is felt. No definite rule can be laid down for this setting, because the actual amount of lead given will vary with different types of engine. On an average the platinum points of the contact-breaker should be set to part just when the piston is still within approximately $\frac{1}{8}$ in. from the top of the compression stroke. With variable ignition the platinum points should separate at the top of the stroke, with the control lever for the ignition at the full-retard position. By so doing, on advancing the control lever the spark occurs earlier.

The time taken by the gases to reach a state of complete combustion is always the same. Therefore, at high engine speeds the spark must occur proportionately earlier, so as to assure complete combustion by the time the piston is starting to travel downward on the power stroke. As engine speed decreases the spark must be retarded, otherwise a pronounced knock will be manifest.

Although with coil and distributor ignition the same end is attained, the method of control is entirely different. The usual procedure is to rotate the distributor about the wiper contact, thus causing the wiper to make contact with the segments of the distributor either early or late in relation to the positions of the piston. See Magneto; Tappet; Valve.

TIN: The Metal. A white, soft, and malleable metal, tin is not used to any extent by itself. Owing to its softness and ductility it is easily worked, and articles made from it can be finished with a brilliant polish, but the surface is easily scratched and bruised. It is considerably used as an alloy, and it readily combines with copper, antimony, bismuth, zinc, and lead. Tinman's solder is composed generally of equal parts of tin and lead. When hardened with a small amount of



Timing. Fig. 2. Diagrammatic examples of cog-wheel timing gears. A, for multi-cylinder car engines; B and C, types for motor cycles.

considerable use to which tin is put is in forming a protective covering for thin sheet iron which is commonly known as tin, but correctly described as tinplate. It is also used on iron wire and small articles made of iron. So long as the protective coating remains intact the iron is prevented from rusting. See Tinplate.

TIN LIFTER. A kitchen utensil used to take hot tins and dishes from the oven, a tin lifter somewhat resembles a pair of pliers in appearance, and has the same gripping action. If kept in a convenient place near the stove, it does away with the necessity of an oven cloth, and protects the hands from minor burns.

TINNED FOOD. Tinned or canned foods, if they are properly handled and stored, will keep longer and better than any other class of preserved food; in fact, certain goods, such as salmon and sardines, improve with keeping. Some classes of foods, however, should only be kept about a year; these are fruits canned with the stones, such as cherries and plums, and all classes of fruits and vegetables which contain acid in fairly large proportion, such as apples, pineapples, tomatoes and asparagus.

Tinned shellfish is liable to discoloration by reason of the large proportion of natural phosphate contained in it. To overcome this difficulty, such fish as lobsters, crabs, crayfish, prawns, etc., are now wrapped in heavy vegetable parchment paper, and as a result can be kept much longer than formerly.

Glass containers are also used for preserving foods, and much thought and care has been exercised in producing caps which will form a reliable airtight seal. The practical advantages attached to cans are that they are easier to handle in the factory, are less fragile, weigh less and are more economical as regards transport costs.

Improved Containers. One of the greatest improvements in the canning industry of recent years is the introduction of a tin commonly called the sanitary tin. In this the use of solder is entirely eliminated, thus doing away with the danger from the acid of fruits acting upon it. The side seams are locked and lapped, while the ends are stamped out of tin plate and edged with rubber solution. The bottom is attached by means of a double seam, and the same process is gone through after the can is filled. Further improvement in canning has been attained through lacquering the inside of the tin to keep the contents a natural colour, for such products as fruit, crab, lobster, etc.

Examining Food. The public are protected by the examination of all imported canned goods at the port of entry. The inspectors, acting under the local authority, examine each consignment. As it is impossible to open every case and examine each can, they

copper, tin forms the best pewter, and although it is often combined with lead for the same purpose, the result is not satisfactory. Bronze is formed with a larger proportion of copper than that used in pewter. Tin is employed for coating iron and copper vessels used for cooking purposes, in the latter case to prevent the poison from the copper getting into the food.

The most considerable use to which tin is put is in forming a protective covering for thin sheet iron which is commonly known as tin, but correctly described as tinplate. It is also used on iron wire and small articles made of iron. So long as the protective coating remains intact the iron is prevented from rusting. See Tinplate.

take a percentage of the consignment, which is usually about 10 per cent., and carefully inspect these. If it is found that only a small percentage of cans are "blown," or otherwise unfit for food, the cargo is passed. Should the percentage of doubtful tins prove large, the whole consignment is thoroughly examined. Further examination of tins is periodically undertaken at the shops.

Should some escape the vigilance of the food inspectors, the following may prove helpful. "Blown cans" and "swells" are tins in which certain organisms have not been killed; they develop in the food and form a gas, which causes the ends of the tin to swell out, or become convex. Such tins, when tapped with the fingers or something hard, give off a "drummy" sound instead of the clear resonant note of a perfect can. These should not be used, as in all probability the food is unfit for human consumption. When doubt arises, if the tin has only just been bought, either return it to the retailer or submit it to the local food inspector, or medical officer of health, for his opinion.

TIN OPENER. A strong tin opener should be included in every kitchen outfit. The commonest type has a sharp blade for cutting, and a spike for knocking a hole in the tin. The tip of the blade is inserted into the hole thus made, and the cutting is done all around the edge of the tin from that point. The hand not holding the tool should steady the tin, on a firm surface; a nasty cut can result should either hand slip. A piece of cloth should be interposed between the steady hand and the tin, as a precaution, especially if the hand is resting upon the top of a flatish tin.

The opener usually supplied with a sandine tin is often ineffectual. A really strong metal "key," some 6 or 7 in. long, can be bought as a permanent replacement.

TINPLATE: How it is Worked. Tin plate is a sheet of iron or steel coated with tin on either side. It is commonly made in two qualities or varieties, known as charcoal and coke brands. These names originated when tinplate was made from charcoal iron for the better quality plate and coke iron for the inferior grades. The distinguishing names are retained, but now represent the depth and finish of the tin coating.

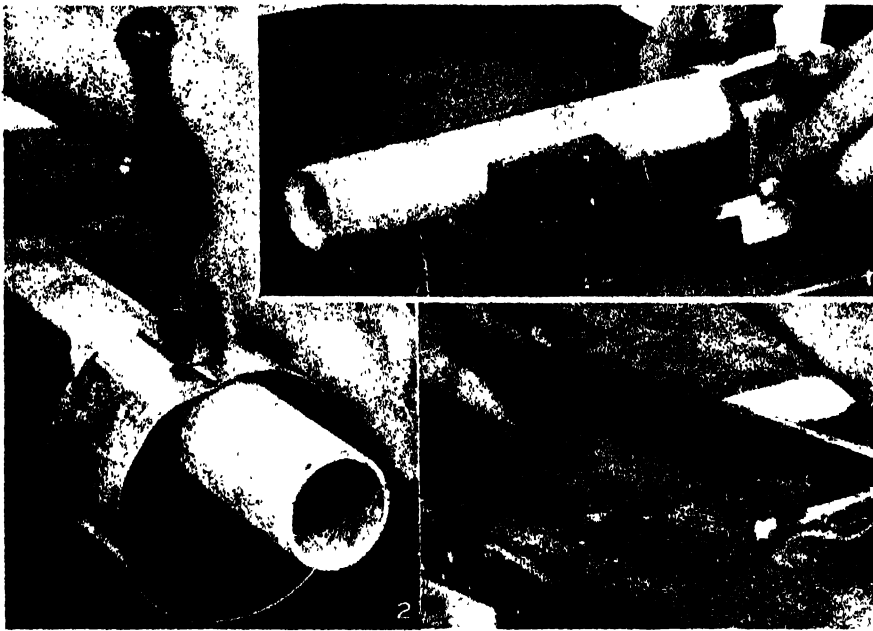
Coke plates are largely used for can construction. For commercial tinplate a common proportion of pure tin to the sq. ft. of plate is .023 or .024 lb. Tinplates are made in sizes measuring 10 in. by 14 in., and also in multiples of these sizes for larger work. The sizes most commonly used measure 20 in. by 18 in. and 20 in. by 14 in.

The thickness of tinplate varies to standard commercial sizes, measured in Stubbs' wire gauge. The thinner gauge plates are known by the table of weights and gauges herewith:

Designation	Gauge	Weight per sq. ft.
86 lb.	30	0.267
75 "	32	0.345
100 "	36	0.450
130 "	40	0.803

Tinplate is often called block tin or simply tin, but these appellations are erroneous. Tinplate in which a certain amount of lead is added is known as terneplate, and consists of soft sheet steel plates coated with a tin-lead alloy, of which a common alloy is made with $\frac{1}{2}$ pure tin to $\frac{1}{2}$ lead. This form of tinplate has considerable rust-resisting properties, and is used in roofing work. For this reason it is also known as roofing plate. Terneplate is manufactured in the same sizes as tinplate.

Tinplate lends itself to the construction of many articles to be found in the household.



A sharp pair of tinman's snips should be used for cutting the plate, and the amateur may find it an advantage to wear an old pair of gloves, as it is very easy to cut the hands on the rough and sharp edges of the material. In cutting tinplate, care should be taken to keep the tin free from scratches or buckles.

How to Bend Tinplate. In order to bend it, the tinplate is smoothed round a cylindrical former where a uniform curved surface is required. Care must be taken to avoid too sharp a bend in one particular place. The whole length of the sheet should be held, and the bending process not localised to one edge of the sheet. In bending the sheet into a curved surface the most difficult part will be found to be the ends of the material. The commencing end should first be bent to the required radius, then the main body of the sheet.

The operation of bending a sheet of tinplate to a cylindrical shape is shown in Fig. 1. Where an article of conical shape is required, a correspondingly tapered former should be used, the tinplate being first marked out to the correct shape. The risk of wasting the material by incorrect cutting may be obviated by marking and cutting a sheet of stiff brown paper to the size required. If this is found to be correct, the paper may be pasted on the tinplate or the tinplate marked off from the paper. Before cutting, allowance must be made for the seam or method of joining. Where a soldered joint is to be made only a slight overlap will be required; it is known as a simple lap seam.

Further strength is imparted to the joint by means of the grooved seam. This is illustrated in construction in Fig. 2, where the edges are turned up on opposite sides of the tinplate to form a hook when the ends are brought together. After the ends of the cylinder have been folded together the seam is hammered flat by inserting a bar to the inside of the tube, on to which the seam rests during the hammering process. In allowing for the seam in marking out, three times the width of the single turned-over edge should be allowed. If the joint is to be watertight the seam must also be soldered. An easy method of turning over an edge or lip is illustrated in Fig. 3 where a straight strip of metal is held against the bend while the lip is hammered flat to the top of the strip.

Where it is required to fit a bottom to a cylindrical object in tinplate several methods of fitting are utilized. Probably the most simple

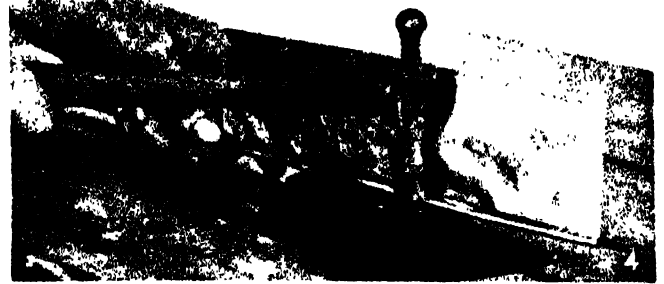
for the amateur is to cut a disk of tinplate fitting exactly inside the bottom of the cylinder or container. When in position, the work is turned upside down and the bottom soldered in place. Further to secure the bottom a ring of brass or similar wire is fitted to the inside of it and soldered in position.

Where the edge of a tinplate article is left exposed it can be bent round a wire to form a smooth and neat edging, as in Fig. 4. This can only be accomplished successfully when the sheet is in a flat state, and it should be done in an early stage. As in the case of a lapped seam, extra metal must be allowed for the wiring of an edge.

Tinplate articles can be purchased so cheaply that it is not worth while to make such things as a kettle, or coffee-pot, which are seamed by machinery and shaped in a press. However, little toys can often be made up from odd pieces of plate or even from material got from

a large tinplate box. Tinplate is useful for repairing utensils, as for example in mending a leaking kettle, watering can, etc. When an acid flux is used all traces should be washed away or the surface will be corroded. A domestic utensil should be boiled out, or washed out with boiling water and well rinsed before using. See Soldering.

TIPSY CAKE. This wine-flavoured cake can be made with a tower shaped sponge cake which should be at least 24 hours old. Cut the cake into thick horizontal slices and spread these with apricot jam. Return them to the



Tinplate work. Fig. 1. Bending to a cylindrical shape. Fig. 2. Closing a seamed joint, which is made by turning up the edges on opposite sides. Fig. 3. Turning over a straight lip. Fig. 4. Forming a neat edge to a sheet of tin by working it round a wire.

original shape of the cake and place it in a glass dish. Half a bottle of sherry is usually poured over it, but the quantity varies according to the size of the cake. Baste it at intervals with the wine which runs from it, and when quite soft stick all over the surface splinters of sweet almonds which have been blanched and dried, without colouring, in the oven. Pour over all a cold, thick rich custard and decorate the base of the cake with little heaps of stiffly-whipped cream, glacé cherries and angelica. See Blanching; Trifle.

TIRES: THEIR USE, CARE AND REPAIR

How Motorists May Avoid Expense and Danger

Too often the car owner is content to see that his tires are not visibly slack. If he will follow the hints and suggestions given here he will find that a minimum amount of regular attention will secure him from any serious tire trouble. See also Bicycle, Motor Car; Puncture.

The wheels of all vehicles have special outer wearing surfaces or tires, whether they are the flanged steel tires of railway vehicles, the steel tires of horse-drawn vehicles, solid rubber tires, or the pneumatic tires used on bicycles, motor cycles, and motor vehicles. Only the pneumatic tire need here be considered in detail.

The high comfortable driving speeds of modern motor vehicles would hardly be possible without pneumatic tires, which cushion the innumerable minor inequalities of the roads and co-operate with the ordinary suspension springs and with the upholstery springs to reduce the effect on the passengers of the more serious road defects.

The original cycle tire invented by Dunlop consisted of an endless inflated rubber tube fitted in the wheel rim. From this has evolved

the modern pneumatic tire consisting essentially of an elastic rubber tube containing compressed air, and a protective outer cover or casing of flexible rubber rendered practically unstretchable by cotton reinforcement embedded in the rubber.

In a pneumatic tire compressed air is utilized to support the weight of the vehicle, to absorb shocks, and to transmit the driving and braking efforts between the wheel and the road. It will fail to achieve these objects unless inflated to the proper pressure. When so inflated the air forces the cover outwards with a uniform pressure of so many pounds per square inch, and the part in contact with the road is flattened until the total pressure exerted by the air from the inside of this flattened area equals the load carried by the tire. The higher the pressure the smaller is this flattened area.



Fig. 1. Rim for beaded tire. Fig. 2. Straight side rim with flat base split transversely. Fig. 3. Straight side rim with flat base and detachable flange. Fig. 4. Well base rim for straight side tire.

All tires are either of the beaded edge type or the wired (straight sided) type. Practically all modern cars, motor cycles, cycles, or aeroplanes are fitted with tires of the second type. Very large numbers of beaded tires are still in use, but this type of tire is rapidly becoming obsolete.

The beaded tire is fitted on a special rim having returned edges or clinches, as shown in Fig. 1. Each edge of the tire is made with a hook or bead which engages under the clinch and has a core of hard rubber. The bead can only be placed in position by stretching it over the clinch, but is nevertheless too elastic to remain on the rim except with the aid of the internal pressure, which forces it into the clinches of the rim and thus holds it firmly in position. If the pressure is seriously reduced the beaded tire, unlike the wired tire, is liable to be forced off the rim by lateral pressures when the vehicle is swerving or cornering.

The straight-sided tire, on the other hand, has no beads. The edges are reinforced by several strands of steel wire which render them practically inextensible, and the rim is also of entirely different design. Three forms of rim suitable for straight sided tires are in use, namely: The flat base, split transversely (Fig. 2); the flat base with one fixed and one detachable flange (Fig. 3); the well base (Fig. 4). The first type has rarely been used on British cars, since the rim is necessarily detachable from the wheel, but it has found much wider application in America.

In the second type of rim the detachable flange is sprung into a groove on one side. The flange can be detached by using a lever, and the tire may then be removed sideways without much difficulty. This form of rim is largely used with heavy commercial tires of the type frequently described as giant pneumatics.

The well type rim is widely used on cycles and motor vehicles. It possesses the advantage of simplicity and lightness coupled with ease of removal and replacement.

The internal air pressure in the tube puts the cover into considerable tension. To render the rubber cover practically inextensible without seriously impairing its flexibility a cotton reinforcement is used. At one time the reinforcement consisted of a number of layers

of coarse woven fabric, with the strands running one way, known as the warp, crossing over and under the strands running the other way, and known as the weft. When subjected to tension the strands are continually bent first one way and then the other. As a tire flexes when in use the strands work over one another and the friction and distortion creates a great deal of heat.

This method of construction, although widely used until a few years ago, is now practically obsolete. The reinforcement used in all rubber tires to-day consists of four, six or more layers of cord made from fine Egyptian cotton. Each cord is completely embedded in rubber independently of the others, so that friction between them is eliminated and the tire if properly inflated runs much cooler, while much longer mileages are obtained.

A cross section through a modern wired tire is shown in Fig. 5, and the detailed construction of one of the side walls is shown in Fig. 6.

long wear and a reasonable degree of freedom from puncture the tread of the tire consists of a considerable thickness of rubber, while the outermost layer of cord is further protected by the breaker strip A, which consists of a strip of coarse canvas running right round. The tire is finally vulcanized or cured by raising it to a certain temperature so as to render it tough, completely elastic and reasonably hard.

Considerable attention is given by tire manufacturers to the design or pattern formed on the tread. Each manufacturer endeavours,

INFLATION PRESSURES FOR CORD TIRES AXLE WEIGHTS (cwt.) AND RECOMMENDED INFLATION PRESSURES (lb. per sq. in.)

BALLOON TIRES—WIRED TYPE

Carrying Capacity per Axle.	4 cwt.	8 cwt.	10 cwt.	12 cwt.	14 cwt.	16 cwt.	18 cwt.	20 cwt.	24 cwt.	28 cwt.	30 cwt.	34 cwt.	38 cwt.
Tire Section													
3.50 inches	22	26	27	28	29	30	31	32	33	34	35	36	37
4.00 "	23	27	28	29	30	31	32	33	34	35	36	37	38
4.40 "	24	28	29	30	31	32	33	34	35	36	37	38	39
4.80 "	25	29	30	31	32	33	34	35	36	37	38	39	40
4.75 "	26	30	31	32	33	34	35	36	37	38	39	40	41
5.00 "	27	31	32	33	34	35	36	37	38	39	40	41	42
5.25 "	28	32	33	34	35	36	37	38	39	40	41	42	43
5.50 "	29	33	34	35	36	37	38	39	40	41	42	43	44
6.00 "	30	34	35	36	37	38	39	40	41	42	43	44	45
6.50 "	31	35	36	37	38	39	40	41	42	43	44	45	46
6.50 23 inches	31	35	36	37	38	39	40	41	42	43	44	45	46
7.00 inches	32	36	37	38	39	40	41	42	43	44	45	46	47
7.50 "	33	37	38	39	40	41	42	43	44	45	46	47	48
7.50 "	34	38	39	40	41	42	43	44	45	46	47	48	49

HIGH-PRESSURE TIRES—STRAIGHT SIDE AND BEADED EDGE TYPES

Carrying Capacity per Axle.	6 cwt.	8 cwt.	10 cwt.	12 cwt.	14 cwt.	16 cwt.	18 cwt.	20 cwt.	23 cwt.	25 cwt.	30 cwt.	34 cwt.	38 cwt.
65 mm	25	30	34	38	42	46	50	54	58	62	66	70	74
80 mm and 3 in.	26	31	35	39	43	47	51	55	59	63	67	71	75
90 mm and 3 1/2 in.	27	32	36	40	44	48	52	56	60	64	68	72	76
105 mm and 4 in.	28	33	37	41	45	49	53	57	61	65	69	73	77
120 mm for 105 mm rim	29	34	38	42	46	50	54	58	62	66	70	74	78
120 mm	30	35	39	43	47	51	55	59	63	67	71	75	79
14 inches	31	36	40	44	48	52	56	60	64	68	72	76	80
13 1/2 inches	32	37	41	45	49	53	57	61	65	69	73	77	81
15 inches	33	38	42	46	50	54	58	62	66	70	74	78	82
150 mm	34	39	43	47	51	55	59	63	67	71	75	79	83

BALLOON TIRES FOR EXISTING RIMS

31 x 4 1/2 beaded	22	25	29	32	35	38	41	44	47	50	53	56	59
3 inch	27	31	34	37	40	43	46	49	52	55	58	61	64
3 1/2 inch	28	32	35	38	41	44	47	50	53	56	59	62	65
90 mm	29	33	36	39	42	45	48	51	54	57	60	63	66
100 mm	30	34	37	40	43	46	49	52	55	58	61	64	67

BALLOON TIRES FOR NEW DIAMETER BEADED EDGE RIMS

720 x 120	20	23	25	28	31	33	36	39	42	45	48	51	54
750 x 130	21	24	26	29	32	34	37	40	43	46	49	52	55
775 x 140	22	25	27	30	33	35	38	41	44	47	50	53	56

for commercial reasons, to produce a distinctive design, but the tread must also possess good wearing qualities and at the same time show little tendency to skid or slip. For this reason all treads are now manufactured with a number of deep, sharp-edged depressions which enable it to bite into the firm surface of the road through a layer of mud. When the tire has worn down so that the pattern is no longer visible, risk of skidding is increased, quite apart from the greater probability of puncture. No cover should be worn so far that the breaker strip appears. The police in some districts even prosecute the owners of cars with smooth tires, on the ground of danger to the public through the increased liability to skid and slip when the brakes are applied.

Although in the past motor cars have often been under-tired, most of the standard pneumatic tires supplied to-day are adequate in size to provide reasonable shock absorption and to give long wear. For this reason it is unnecessary, in order to obtain increased comfort, to use lower inflation pressures than those recommended by the manufacturers. All tire manufacturers are substantially in agreement as to the pressures at which the

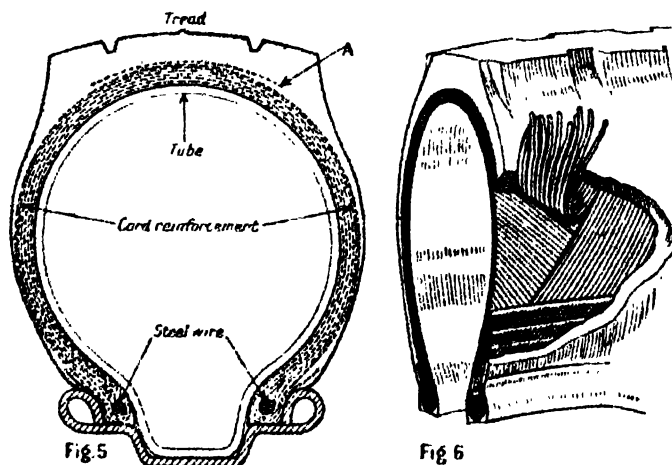


Fig. 5. Cross section through a modern wired tire and rim. Fig. 6. Detailed construction of one of the side walls.

different sizes should be run, and all tires are liable to the same kind of failure if they are not run at the proper pressure. The pressure in any given size depends within limits upon the load carried. The table in page 1299 shows the pressures recommended by the Dunlop Company for the various permissible loads on various sizes. The diameter as a whole is not mentioned; only the width need be considered. In many cars the load on the front tires is less than that on the rear tires, but the Dunlop Company recommend that, except in the case of high pressure tires, the front tires should be pumped as hard as the back in order to provide easy steering and to reduce wear of the tread.

The appearance of a tire is no guide to the inflation pressure. Long before a tire looks flat, irreparable damage may have been done. The only satisfactory method is by the use of a pressure gauge applied to the valve independently of the pump. The gauge should be used at least once weekly and any shortage should be made up. If this is done regularly very little pumping is required.

Results of Under Inflation

Reference will now be made to a few of the more probable results of under inflation. Every tire when working is flattened slightly at the part in contact with the ground and one result of this flattening is a slight bending of the side walls. If the inflation pressure is insufficient this bending becomes excessive and is greater than the natural flexibility of the walls can deal with, so that the cord frays and ultimately breaks. The effects may not be immediately apparent. By the time that the outer coating of rubber or the tire paint shows signs of a split running round or partly round the side wall, the cord reinforcement may be ruined beyond repair.

A further result of under inflation is excessive wear due to the tread not being sufficiently supported and therefore being flabby, so that it distorts and scrapes over the road much more than usual. This wear is additional to the normal wear due to the transmission of steering stresses and the driving and braking efforts.

The front wheels on nearly all cars are played outwards slightly, so that there is a tendency to wear rather more on the outside than on the inside. When the tires are insufficiently inflated, the outer part wears down rapidly. In the ordinary way any differences are small and can be equalized by turning the tire round about every two thousand miles.

Another form of trouble known as a concussion burst is due to a tire striking a sharp projection, such as a brick, at speed. Such a blow may be so violent and so localized that it will fracture one or two of the cord reinforcements, and this trouble may spread until the cover bulges or bursts. The effects may not become apparent until several weeks after the actual blow causing the trouble. The probability of damage is reduced to a minimum by running the tires at the proper pressures.

The front wheels of a car may be parallel to one another but should preferably be given a small amount of "toe-in," the front edges of the rims being between $\frac{1}{4}$ in. and $\frac{1}{2}$ in. closer together than the rear edges. Any departure from these conditions of alignment will result in excessive wear.

Apart from troubles due to under inflation or non-alignment, the amount of wear of tires depends very greatly upon the manner in which a vehicle is driven. The forces exerted between the tire and the road when a car is accelerated or braked suddenly are very great and are all transmitted through the tires. It will thus be evident that the service obtainable from tires is largely within the control of the driver.

Care of Tires. However tough the rubber of the tread be, it is liable to be cut by sharp flints, nails, glass, etc. A small superficial cut is of no importance, but a cut sufficiently deep

to reach the cord reinforcement may ruin a tire in a short time owing to moisture reaching the cotton and causing it to rot. The trouble may thus spread outwards from the original opening and ultimately result in a burst which is too large to repair. A lookout should therefore be kept for deeper cuts and they should be

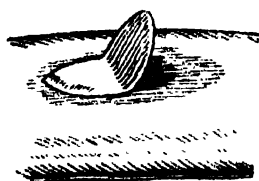


Fig. 7. Showing a patch on a tube partly stuck down.

cleaned out and filled up with some special rubber composition. Rubber is rendered soft and spongy by exposure to oil or paraffin. Any oil on the tires due, for example, to a leaky back axle or pools on the garage floor should be cleaned off with a rag and a little petrol. Petrol itself is a solvent of rubber, but evaporates so quickly that it cannot in the ordinary way cause any damage.

Whenever a puncture occurs, the first consideration should be the cause of the trouble, and the cover should therefore be examined carefully for evidence of a sharp flint, the point of a nail, etc. Punctures or cuts in tubes may be repaired by vulcanizing or patching. The former method need only be applied when the cut is large, and is best left to firms having suitable vulcanizing apparatus. The possession of vulcanizing equipment by a private owner is seldom worth while. Most punctures can, however, be repaired quite readily by patching, and the following remarks will apply to most of the puncture repair outfits available to-day.

The tube must first be thoroughly cleaned and rendered free of oil, grease, or moisture. This may be effected by a little petrol applied with a rag or by rubbing with the special perforated metal scraper supplied with the outfit. Solution from a tube is then applied over a sufficiently wide area and in some cases the surplus is scraped off at once with a knife; in other cases the patch must not be applied until the solution has become tacky, or almost dry.

While the solution is drying the patch can be cut out from the sheet, the edge being bevelled by a pair of scissors. An attempt may then be made to tear it in halves across the middle. The linen protecting the prepared side will thereby be torn in halves, but the rubber will yield and will not be affected. Half of the linen may then be peeled off and care must be taken that the fingers do not touch the surface which is thus exposed. This exposed surface should then be applied to the tube, as shown in Fig. 7.

The other half of the linen should then be pulled off and the remainder of the patch stuck down. Finally the patch should be rolled hard or worked down with considerable force to ensure good contact with the tube. Neglect of this final operation may make it necessary to remove the patch—a somewhat difficult operation—and apply a fresh one.

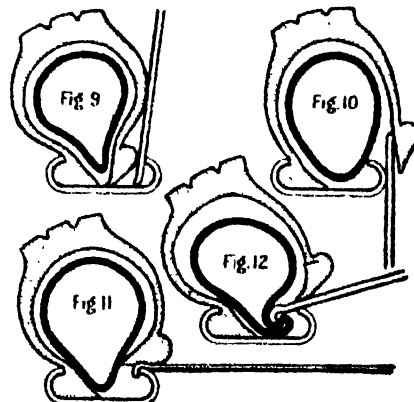
Many small punctures cannot readily be found by inspection and it is then necessary to remove the tube completely, inflate it with air as far as this can safely be done, and immerse it in water. A small bowl of water, in the absence of a large receptacle, is sufficient for this purpose. Each section when immersed should be watched carefully for bubbles of air, which in the case of a small hole may only rise at intervals. The position of the puncture when found should be marked with pencil, but the whole of the tube should be tested for any further punctures. A slight leakage from a tire may be due to a defective valve. This may readily be ascertained by turning the wheel until the valve is on the top and then testing its tightness by means of a small cup filled with water. Should there be any leakage the inside of the valve must be replaced.

Removing and Replacing Tires

Reference has already been made to the ease with which a straight sided tire can be removed from or replaced on a well type rim. The method of doing this is illustrated in Fig. 8. The edge should not in any circumstances be forced over the rim, as no useful purpose is served and it may be damaged. Before removing the tire all parts of the valve should be removed and both edges of the cover should be pushed right into the well at the part diametrically opposite the valve. The edges of the cover near the valve may then be gently levered over the rim. When replacing the cover one edge should be pushed over the flange of the rim right down into the well and the edge of the other side of the cover can then be pushed easily over the flange. The tube should be slightly inflated but not stretched tight and is then placed in the cover with the valve projecting through the hole in the rim. In many cases the valve projects towards one side and the tube must therefore be placed correctly in position. The second edge of the cover may then be placed in position by pushing it down into the well of the rim at a point diametrically opposite the valve, and it may be gradually worked over the flange. The last few inches may be forced on, if necessary, by small levers.

The removal and replacement of beaded edge tires presents somewhat greater difficulty, since the beads have to be sprung over the clinches of the rim. To remove a tire the straight end of the lever is forced in as shown in Fig. 9 and the lever is bent round, using the clinch of the rim as a fulcrum, as shown in Fig. 10. Two or three levers will have to be employed, working right round the rim in this manner.

In general it is sufficient merely to remove one edge of the tire, leaving the other on the rim. The tube should be partly inflated and then inserted into the cover and as far as possible over the rim, the valve being inserted



Figs. 9 and 10. Removing a beaded edge tire. Fig. 11. Replacing a cover. Fig. 12. The tube must not be slipped, as shown here, when replacing cover.

through the hole in the rim. Starting near the valve, the edge of the cover can be inserted in the clinch and worked into position gradually all the way round, using the hooked ends of the tire levers as shown in Fig. 11, taking care that the lever does not nip the tube, as shown in Fig. 12. Two or three levers should be used, and it will generally be necessary to expend some effort to force the last section of bead over the clinch. The levers should be held firmly, otherwise the elasticity of the tire may cause them to jump up violently into the face of the operator or a bystander.

TISSUE : The Dress Fabric. All woven fabrics are tissues in one sense, and some of them are officially described as woollen tissues or worsted tissues in British trade returns. The French call light cloth tissues as distinct from heavy cloths or draps. The word is often used in English to denote tinsel cloths.

TOADFLAX. There are some charming annual and perennial plants among the toad-flaxes, all suitable for the rock garden and flower border. The most vigorous kind is the Dalmatian toadflax (*Linaria dalmatica*): it grows 3 feet high bears yellow flowers in summer, and thrives in ordinary soil. *Linaria alpina* is a small plant for the rock garden, bearing orange and purple flowers. The Kendwortb ivy (*Linaria cymbalaria*) is a trailing plant useful for planting in walls: it has lilac-coloured flowers. It is best to raise these from seeds sown in boxes in a frame in spring. The annual toadflaxes are raised from seeds sown out of doors in spring where the plants will bloom in summer; the chief species are *bipartita* and *maroccana*.

TOAD IN THE HOLE. The dish known as toad in the hole can be made from 2 lb. mutton or beef, $\frac{1}{2}$ lb. flour, 3 eggs, $1\frac{1}{2}$ pints milk. Sieve the flour and salt into a basin, stir in the eggs and a little of the milk, and beat all to a smooth batter. Gradually work in the rest of the milk, and let the whole stand for at least half an hour.

Free the meat from fat, skin and bone, cut it into neat slices, fry these in hot dripping, and then put them into a greased pie-dish. Sprinkle them with salt and pepper, pour the batter over, and bake the whole in a moderate oven for 14 hours. Serve it very hot, with a folded napkin pinned round the dish. If preferred, this can be made with sausage or cold meat, when it will require only about an hour's baking. See Batter, Sausage.

TOAD LILY. The chief species of toad lily is *Tricyrtis hirta*, a hardy, or nearly hardy, herbaceous perennial, with violet-spotted flowers in autumn; height about 2½ ft. It should have a sheltered, sunny position in a friable loamy soil. Propagation is by division in spring.

TOADSTOOL. The popular name of toadstool is usually applied to an uneatable fungus as distinguished from eatable agarics, of which the common mushroom is an example. More than 1,000 species of agarics are known, some being poisonous. See Fungus; Mushroom.

TOAST. Bread should be toasted slowly, evenly, and only on the surface, and it should feel quite crisp to the touch. It is served either buttered or as dry toast. Toast is used extensively for many culinary purposes. It forms a foundation for dishing various savouries, vegetables and small birds. Toast cut in shapes is used as a garnish. Dry toast should be made with bread which is at least 24 hours old. Cut as many thin, even slices as will be required, and toast each piece under the gas grill, or in an electric toaster, or on a fork before a clear fire.

French toast is a good way of using up slices of bread and butter which have been left over from tea. It should be made with rather thin bread and butter. Two slices are laid one over

the other, with the butter side inwards. They are lightly pressed together, and should be toasted in the ordinary way. No extra butter is needed, as the butter already on the bread penetrates the soft part and also imparts a rich, crisp taste to the toast. It should be eaten very hot straight from the fire. Set a plate on the hearth to catch any falling grease.

Toast Water. This is a refreshing drink. To make it, a very thin slice of bread should be toasted until it is thoroughly brown and dry all over, but not burnt or blackened. Put the slice of toast into an earthenware jug, and pour over it $1\frac{1}{2}$ pints of boiling water, then cover the jug and set it aside till cold.

Toasting Fork. When toasting bread or cakes in front of an open coal or gas fire the use of a special fork is advisable. The simplest form consists of three or four short wire prongs and a long handle of wood or metal. Some handles are made on the telescopic principle.

Toast Rack. Toast racks are made of china, earthenware, silver, Sheffield plate, and electro-plate. There is not a great variety of styles in these pieces, but metal designs copied from 18th century models are usually more elegant than later ones.

TOBACCO. In purchasing his tobacco the pipe smoker has to consider the qualities which he desires in his particular brand, the strength which suits him, and, of course, the price.

Pipe tobaccos are sold loose or in packets or tins of 1 oz. and 2 oz., larger quantities in tins containing $\frac{1}{2}$ lb., $\frac{1}{4}$ lb., or 1 lb. While the majority of smokers usually buy their tobacco in small quantities, it is often convenient and slightly more economical to lay

in a week's supply at a time. Tastes naturally differ as to choice of brand. The first object is to get a cool-smoking tobacco. However fragrant and agreeable to the palate a mixture may be, the pleasure of smoking it is entirely spoilt if it is too hot on the tongue and perhaps has a tendency to heat the bowl of the pipe.

Tobacco Pouch. Most pipe smokers carry their tobacco in a pouch or case. These are made in various sizes, and of materials which include rubber, oilskin, and leather. A leather pouch usually has a lining of rubber. A popular type is made entirely of rubber, one half folding over the other half in which the tobacco is contained. Pouches with zip fasteners are obtainable. See Nicotine; Pipe, Smoking.

TOBACCO PLANT. The half hardy annual plant *Nicotiana glauca* is grown in gardens in Great Britain because of its delightfully scented white flowers. It is raised by sowing seed in a warm greenhouse in February, the seedlings being planted out in May and June. There are coloured varieties—red, crimson, pink—but these are less fragrant than the white type.

Tobacco for smoking is made from the large leaves of the species *N. tabacum*. This does well in a sunny piece of rich ground in warmer localities of Great Britain. The plants need to be watered in dry weather, and if all goes well the leaves are ready for gathering at the end of September, when the operation of drying has to commence. Slugs and snails are destructive enemies of the tobacco plant, even worse than a wet and sunless summer.

TOBOGGAN FOR WINTER SPORTS

How to Build a Clipper for Two Adults

The amateur who wishes to make a toboggan should consult also the various articles in our work that deal with the tools and materials used by the woodworker, such as Amateur Carpentry; Bit, Bolt, Joint, Mortise; Spokeshave, and a glance through the article will suggest other references.

As the sport of tobogganing consists mainly in coasting very rapidly downhill, the design of a toboggan, which is a form of sledge, must be strong enough to withstand rough usage. In its simplest form the toboggan consists of boarding fixed across a couple of wooden runners, but more elaborate forms are in use to accommodate parties instead of a single person. A clipper toboggan large enough to carry two adults is shown in Fig. 1, its component parts being detailed in Fig. 2. Only well-seasoned pine, ash, or elm of the best quality should be used, cut to size and ready planed. The timber and other materials required are shown in the table.

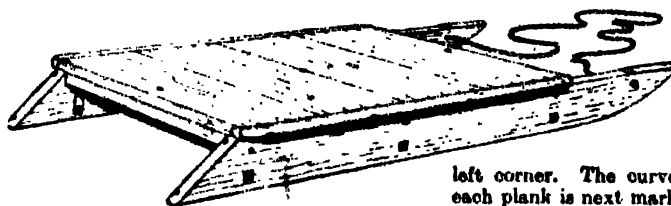
Having made sure that each piece of timber is cut exactly to size and properly squared, the rods for the hand grips B are prepared. The centre of one of the long sides of each rod is found, and a parallel line drawn through the point from end to end of the rod; then four $\frac{1}{8}$ in. diameter holes are bored through each rod from points marked off on the centre line. The first point is $1\frac{1}{2}$ in. from the right end; the second, 7 in. from the $1\frac{1}{2}$ in. point; the third, 7 in. from the 7 in. point; the fourth, 7 in. from the last 7 in. point. All the points must be placed exactly on the centre line, then the holes are carefully bored through

and afterwards countersunk with a rose-bit. Both edges of the side of the rod from which the holes were countersunk are now planed to a slight bevel, as shown in Fig. 3, then both ends of each rod are rounded as detailed in the same diagram.

The two runners C are the same size and shape, the marking out of the planks from

	Long ft. in.	Broad in.	Thick in.
1 boards for the seat (A)	1 2	6	1
2 wooden rods for the hand grips (B)	2 0	1	1
2 planks for the runners (C)	3 0	4	1
3 pieces of wood for the cross-bars (D)	1 0	2	1½
3 lengths of 1-round strip iron for the brace irons (E)	1 3	1	½
2 ditto for the runner irons (F)	3 10	1	1
17 wood screws ½ in. diameter	2		
4 " " " "	1½		
21 " " " "	1		
60 oval wire nails	2		
6 bolts of ½ in. diameter with slotted countersunk heads and square nuts	1½		
2½ yards of 1 in. hemp rope for the draw rope (G)			

which they are made being as follows. A space of 8 in. is marked off from the right ends, then a line at right angles is drawn through each point across the breadth of each plank. A space of 4 in., measured from the upper left corner, is marked off on the upper side of each plank, and a diagonal line is drawn from each point to the lower left corner. The curve at the right end of each plank is next marked out in the following manner. The centre of the breadth of one of the seat boards is found (3 in.), and a



Toboggan. Fig. 1. Clipper toboggan to carry two adults. Its construction is described in this article.

parallel line drawn through the point from end to end of the board; the runner-planks and board are then placed flat on the bench in the positions shown in Fig. 4, the centre line on the board being a continuation of the line previously drawn through the 8 in. point on each runner. A space of $9\frac{1}{2}$ in., measured from the lower side of the lower plank (i.e. the plank nearest the front of the bench), is marked off on the line on the board, then a similar space is marked off from the upper side of the upper plank.

The next step is to draw the curves with a compass set to a radius of $9\frac{1}{2}$ in., using the points marked on the lines as centres, as detailed in Fig. 4. If a large compass is not available, the curves may be drawn by arranging a pencil, tack, and loop of string as

iron. Five $\frac{3}{8}$ in. diameter holes are drilled through the centre of the thickness of each length from the points detailed in Fig. 7, the points being placed on centre lines. The centre of the breadth of each $\frac{1}{2}$ round side is found, and a parallel line drawn through the point from end to end of each length, then the points for the holes are marked off. The first point is $\frac{3}{8}$ in. from the right end of each length; the second, $1\frac{1}{2}$ in. from the $\frac{3}{8}$ in. point; the third, $5\frac{1}{2}$ in. from the $1\frac{1}{2}$ in. point; the fourth, $5\frac{1}{2}$ in. from the $5\frac{1}{2}$ in.; the fifth, $1\frac{1}{2}$ in. from the last $5\frac{1}{2}$ in. point.

The points are marked with a centre punch and the holes bored with a $\frac{3}{8}$ in. twist drill fitted in either a brace or a hand-drilling machine. Each hole should be countersunk from the $\frac{1}{2}$ round side of the strip iron, using

from a 3 ft. 10 in. length of 1 in. broad $\frac{1}{2}$ -round strip iron. Eight $\frac{3}{8}$ in. diameter holes are drilled through the centre of the thickness of each length from the points detailed in Fig. 9. A centre line is first drawn, then the points are spaced in the following order: The first point on each length is $\frac{1}{2}$ in. from the right end; the second, $1\frac{1}{2}$ in. from the $\frac{1}{2}$ in. point; the third, $9\frac{1}{2}$ in. from the $1\frac{1}{2}$ in. point; the fourth, 6 in. from the $9\frac{1}{2}$ in. point; the fifth, $13\frac{1}{2}$ in. from the 6 in. point; the sixth, 6 in. from the $13\frac{1}{2}$ in. point; the seventh, $5\frac{1}{2}$ in. from the 6 in. point; the eighth, 4 in. from the $5\frac{1}{2}$ in. point. The holes are drilled and countersunk in the same way as those bored in the brace irons.

The ends of each length are next marked and bent to the angles detailed in Fig. 10. A space of 3 in., measured from the right end, and a space of $5\frac{1}{2}$ in. measured from the left end, are marked off on the broad side and slightly incised with a cold chisel. The left ends of the lengths are heated to a bright

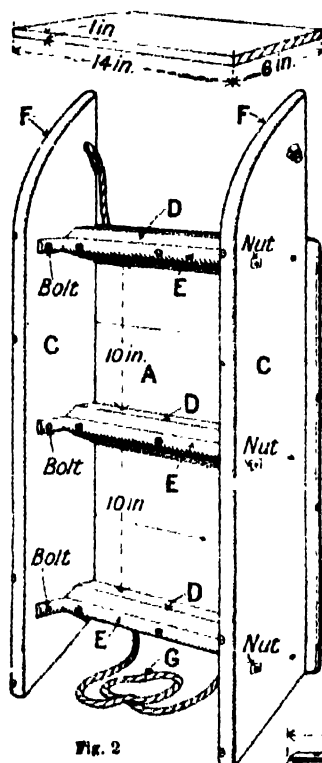


Fig. 2

shown. A space of $\frac{1}{2}$ in., measured from the upper side, is marked off on the surface of each plank, then a parallel line is drawn through each point from end to end of the plank, as detailed in Fig. 5.

Four $\frac{3}{8}$ in. diameter holes are bored through the thickness of each plank from points marked off on the parallel lines. The first point is 3 in. from the right end of each plank; the second, 6 in. from the 3 in. point; the third, 11 in. from the 6 in. point; the fourth, 11 in. from the 11 in. point, Fig. 5. The planks are now cut to shape, the waste wood being removed from the right ends by sawing along each curved line with a keyhole saw, then the curves are neatly finished with a spokeshave. The left end of each plank is cut to the angle shown in Fig. 5, by sawing along the diagonal line.

The three pieces of wood for the crossbars D are prepared by planing two of the long edges of one of the broad surfaces of each piece. The portion to be removed from each edge is marked off as follows: From the right and left long edges mark off a space of $\frac{1}{2}$ in. on the surface and right and left sides, then draw a parallel line through each point from end to end of each piece of wood (Fig. 6). The three brace irons E are each made from a 15 in. length of $\frac{1}{2}$ in. broad, $\frac{1}{2}$ round strip

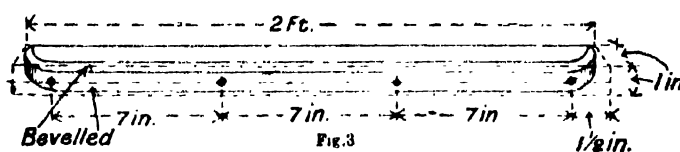


Fig. 3

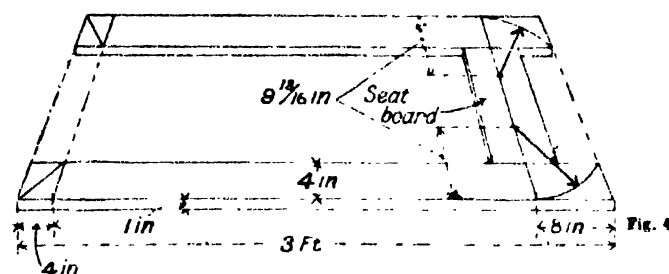


Fig. 4

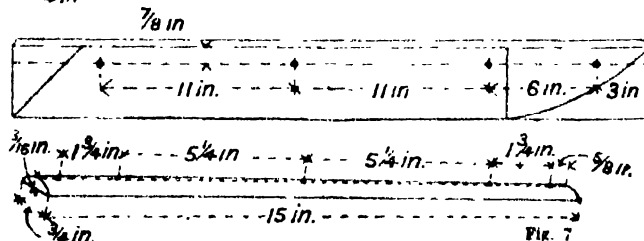


Fig. 5

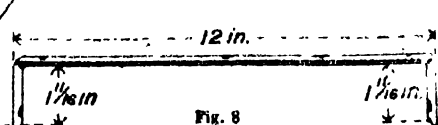


Fig. 6

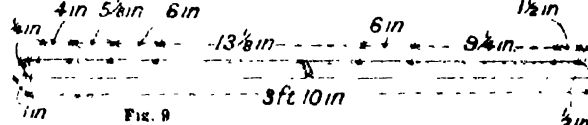


Fig. 7

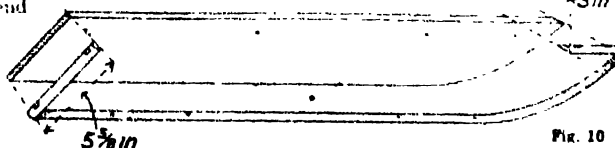


Fig. 8

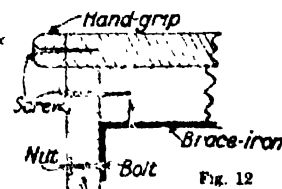


Fig. 9

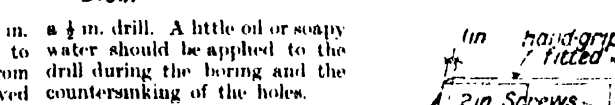


Fig. 10

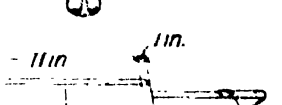


Fig. 11

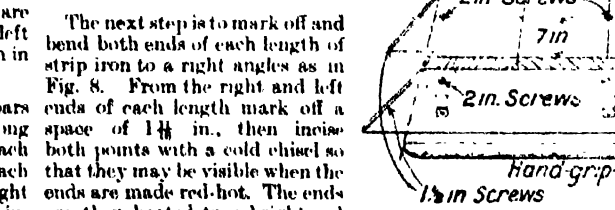


Fig. 12

a $\frac{1}{2}$ in. drill. A little oil or soapy water should be applied to the drill during the boring and the countersinking of the holes.

The next step is to mark off and bend both ends of each length of strip iron to a right angles as in Fig. 8. From the right and left ends of each length mark off a space of $1\frac{1}{2}$ in., then incise both points with a cold chisel so that they may be visible when the ends are made red-hot. The ends are then heated to a bright red and hammered over from the marks to sharp right angles. After bending each end plunge the strip into water. The runner irons F, Figs. 9 and 10, are made

Toboggan. Fig. 2. Component parts of clipper toboggan. Fig. 3. Preparing hand grips. Fig. 4. Setting out curves on runners and right method of drawing curves. Fig. 5. Marking out runner planks. Fig. 6. Cross-bar ready for chamfering. Fig. 7. Marking out brace irons. Fig. 8. Brace iron bent at ends. Fig. 9. Marking out runner irons. Fig. 10. Runner irons bent to shape. Fig. 11. Seat boards fitted to position. Fig. 12. Section showing position of brace bolts

red for about 6 in., and bent from the incised marks to the angle of the left end of the runners, as shown in Fig. 10. The right ends are similarly treated, after which each length is reheated and bent to the shape of the curved ends of the runners.

This needs to be done with some accuracy, and if the home worker has not the facilities for this somewhat difficult part of the work, the blacksmith from whom the strip iron is bought would doubtless do the bending and drilling for a reasonable charge.

To assemble the parts, the runners are placed on a level surface and set in position 12 in. apart, exactly parallel to each other and in line, and hot glue is applied to their upper sides. The seat boards are fitted in position on the runners, as detailed in Fig. 11, both ends of each board being secured by three 2 in. oval wire nails. Hot glue should be applied to the long sides of the boards before fitting them in place. The hand grips B are glued and nailed to the sides of the seat, then a 2 in. screw is inserted into each of the countersunk holes in the hand grip and driven firmly into the seat boards.

The crossbars D are glued and fastened by 3 nails each to the under side of the seat, the position of each bar being detailed in Fig. 2. A 2 in. screw is driven into both ends of each bar from the holes previously bored through the runners, countersinking the holes before inserting the screws. In order to secure the bars further, a $\frac{3}{4}$ in. diameter hole is bored through the seat at each of the points detailed in Fig. 11, then each hole is countersunk and a 2 in. screw driven into the centre of the crossbar below. It may be noted that the screws will be easier to drive if a small gasket hole is made for each and a little vaseline applied to the threads.

Fitting Brace and Runner Irons

The brace irons E are fitted to the crossbars as shown in Fig. 2, each iron being secured with three 1 in. screws. A $\frac{1}{4}$ in. diameter hole is bored with a gullet through each runner from each of the holes in the angles of the brace irons, then a recess of the exact size of the nuts on the $1\frac{1}{2}$ in. bolts is cut at each hole on the outside of the runners and a nut placed in it. The bolts are inserted into the holes in the angles of the brace irons and driven in with a screw driver until they are firmly screwed into the nuts, as shown in the sectional diagram in Fig. 12. If the ends of the bolts project, they should be filed down nearly flush and then riveted.

The runner irons F are now fitted in position on the runners and attached with screws. A $1\frac{1}{2}$ in. screw is driven into each end hole, and a 1 in. screw into each of the other holes. The draw-peg G is attached by first enlarging with a $\frac{3}{4}$ in. drill, the $\frac{1}{4}$ in. diameter hole previously bored at the curved end of each runner, then an end of the 2 $\frac{1}{2}$ yd. length of rope is inserted into each hole from the inner side of the runner and secured.

The woodwork should be well smoothed with sandpaper, and all the corners and edges carefully rounded with a rasp. A nail punch should be used to drive each nail in the seat, hand grips, etc., a little below the surface of the wood, to remove a possible cause of torn clothes or injuries while sledging. When the runner irons have been polished smooth and bright with coarse emery cloth, the toboggan is complete and may be given several coats of good varnish paint as a finish.

TOBY JUG. The original Toby jug used for holding beer was in the form of a stout figure of a man wearing a cocked hat and knee-breeches, and generally embodying a variety of glazed colourings. A typical example shows a squat little figure attired in a purple coat, green waistcoat, yellow breeches, and white stockings, in Staffordshire pottery. Potters

frequently rang the changes on these colours by varying the colour of the coat or breeches in products of the same mould. There are many variations in the design of the figures, which have recognized values among collectors according to their artistic merit and rarity.

Favourite designs include the typical English squire, John Bull, the sailor, the snuff-taker, Simple Simon, the postboy astride of a barrel, the watchman with his lantern. Others represent historical characters like those which bear the name of Nelson, Napoleon, Lord Howe, and many other celebrities in the later varieties of the Toby jug. Green and buff glazes is common, but at least one variety is blue and white with a flat beaver hat.

Modern Toby jugs of brown Doulton and other ware are decorated with small facsimiles of the old English figures, and other designs in white enamel. These may be bought singly or in sets of three in different sizes. Toby ware is also used for tobacco jars and for small cruet.

TODDY. Toddy is a mixture of whisky, sugar, and hot water. To make it, put into a tumbler a lump of sugar, a piece of thin lemon peel, and a silver tea-spoon. Fill the



Toby Jug modelled by Walton early 18th century
British Museum

tumbler one-quarter full of boiling water. Cover it over until the sugar is dissolved, and then add a wineglassful of whisky.

According to the old practice toddy or grog should be made in the large, wide-mouthed glasses generally known as rummers. The whisky is always added last, and according to one of the old recipes it should be laid in spoonfuls on the top of the boiling water. This process is supposed to get rid of fuel oil.

In serving toddy it was customary to use ordinary wine-glasses as well as the rummers. These were intended for the ladies of the party, and were filled from the rummer with the long, curved silver spoon or ladles known as toddy spoons.

Many choice examples of cut-glass toddy tumblers and spoons are to be found in private houses, and are still brought into use on occasions when it was formerly the custom to brew a bowl of punch.

See Rummer.

TODEA. This is a genus of filmy ferns which, with the exception of *Todea africana*, should be grown in a closed case kept moist and shaded. One of the most beautiful is *Todea superba*. See Fern.

Toe. See Foot.

TOFFEE AND TOFFEE SWEETMEATS

Recipes for Butterscotch, Caramels, Humbugs, and Other Varieties.

This contribution deals with confections that require a basis containing as its main ingredients sugar and butter or cream. Other low cooking information is given under the headings Chocolate Making, Nougats, Sweeties, Fudges, Doughs. See also Glucose, Sugar, and the entries on other ingredients.

The hard sweetmeat known as toffee is made chiefly from butter and sugar. Unlike other hard sweets, such as rocks, for which white sugar is used, a large proportion of brown sugar or treacle is used in most toffee-making to prevent granulation during boiling and stirring, and a fatty constituent is required. Glucose or cream of tartar is also included in many of the recipes. Various flavourings or nuts are added to make the different kinds. Recipes for the toffees are here given before proceeding to the toffee sweetmeats.

A good plain toffee, often known as hard-bake, can be made by melting 3 oz. butter in a small bright pan, stirring in 1 lb. brown sugar and continuing to stir until the mixture becomes hard and brittle when a small portion is tested in cold water. If stirring is discontinued the toffee will burn. When ready pour it into an oiled tin and leave to set. Before it is quite hard mark it into squares.

Butterscotch. This is a delicious variety of toffee distinguished by being made with white sugar instead of brown. Place 1 lb. loaf or granulated sugar into a saucepan con-

taining 1 gill fresh milk. Heat slowly and stir occasionally till the sugar has melted. Add a pinch of cream of tartar, and 3 oz. fresh butter, the latter a small piece at a time. Boil the mixture until it is a light coffee colour, drop a little of it into very cold water, and leave it a few seconds.

Take out the little lump, and, if it is quite brittle, add a few drops of essence of lemon and lemon juice, and pour the mixture at once on to oiled tins or plates to the depth of a $\frac{1}{4}$ in. When it is nearly cold, cut it into oblong-shaped pieces, as shown in Fig. 1. If to be stored in a tin first wrap each piece in wax paper, and then in tin foil. Keep the toffee in a cool, dry place.

Everton Toffee. The ingredients for Everton toffee are 2 lb. white sugar, $\frac{1}{4}$ lb. dark sugar (Barbados), $\frac{1}{4}$ lb. glucose, $\frac{1}{4}$ lb. fresh butter, $\frac{1}{2}$ pint milk, a pinch of salt, and a few drops oil of lemon. Melt the sugar, glucose and milk in a large pan, then place it over gentle heat, add the butter, and boil to 270°. Stir in salt and oil of lemon very gently, and pour the toffee into greased tins. Brush these over with pure vaseline first. This is tasteless and harmless, and, unlike butter and vegetable oils, free from rancidity.

Ginger Toffee. To make ginger toffee, mix in a saucepan 3 lb. brown cane sugar and 2 level teaspoonfuls ground ginger, and add about $\frac{1}{4}$ pint white vinegar and a lump of butter slightly larger than a hen's egg. Let these stand by the side of the heat until the sugar has melted, then boil them up and continue boiling until the toffee snaps when a little of it is dropped into cold water. Pour the toffee into oiled tins, and let it harden.



Toffee. Fig. 1. Butterscotch, made with white sugar

Honey Toffee. Melt 1 lb. loaf sugar in $\frac{1}{2}$ pint water. When it is on the point of boiling, add 1 dessertspoonful glucose, $\frac{1}{2}$ lb. each honey and butter, and 2 or 3 tablespoonfuls cream. Boil the whole to 285° F., stirring all the time; then pour it on to a buttered marble slab, and when cold break it up, wrap the lumps in waxed papers twisted slightly at both ends, and store in a tin.

Nut Toffees. Walnut toffee is composed of 1 lb. white sugar, 1 lb. brown sugar, $\frac{1}{2}$ lb. glucose, 2 oz. butter, a full $\frac{1}{2}$ pint water, $\frac{1}{2}$ lb.



Toffee. Fig 2. Walnut toffee cut into bars

walnuts, slightly roasted, and a few drops of lemon. Boil to 270° as already explained. Remove the pan from the heat, and add the walnuts, either whole or chopped. Stir gently. Place over the heat again for a few minutes, add the lemon, and pour. Mark the toffee deeply with oiled knife, and when set cut into bars.

Almond and brazil nut or peanut toffee can be made in the same way, using blanched skinned, and neatly cut almonds or the other nuts in place of walnuts. Coconut toffee is made a little differently. Put 1 oz. butter in a saucepan, add to it when it is melted 1 small tablespoonful golden syrup and the same of milk. When these are mixed, add $1\frac{1}{2}$ lb. fine white sugar and 2 tablespoonfuls desiccated coconut. Stir frequently and boil the mixture fast until it candies and grains well on the sides of the pan. Stir in half a teaspoonful of vanilla, and pour it out into an oiled tin. Leave it until cold and cut it up.

Peppermint Toffee. Put into a saucepan a tin of unsweetened condensed milk, $1\frac{1}{2}$ lb. brown sugar, $\frac{1}{2}$ lb. butter, and two tablespoonfuls golden syrup, and stir them at the side of the stove until they melt. Then place the pan directly over the heat and boil its contents rapidly, stirring all the time. When they are a dark chocolate colour, take the mixture from the stove and drop a little of it into a basin of cold water. If it hardens, the toffee is cooked, and some peppermint essence can then be stirred in. Pour all on to a greased tin, and let it cool a little before marking it into squares, then set it aside to become quite cold.

Russian Toffee. This is made with the following ingredients: 1 lb. brown sugar, 1 lb. white sugar, $\frac{1}{2}$ lb. glucose, $\frac{1}{2}$ pint milk, $\frac{1}{2}$ pint cream, $\frac{1}{2}$ lb. fresh butter, and a few drops of vanilla essence. Place the sugar, glucose, and milk in a large-sized pan and boil carefully to 260°. Add the cream, and bring up to 260° once more. Add melted butter and boil to 270°. Remove from the fire, gently stir in the essence, pour into oiled tins, mark off when partly set. When cold, cut into squares as seen in Fig. 3. If desired to store, wrap the block in waxed paper, and cut off the marked squares as required.

Treacle Toffee. The main ingredients of treacle toffee are 2 lb. each of black treacle and brown cane sugar. Put these into a pan with a lump of butter about twice the size of a hen's egg, and let them melt slowly at the side of the stove. Then boil up the toffee, stirring it all the time, and continue stirring until it becomes brittle when a spoonful is dropped into cold water. Add a little vanilla flavouring, and pour the whole into an oiled tin.

Caramels. A softer type of toffee is the basis of the sweets known as caramels. Coffee,

chocolate, and vanilla are popular flavours. Vanilla caramels can be of either the hard or soft varieties. For the hard caramels, take $2\frac{1}{2}$ lb. white sugar, 6 oz. glucose, 1 pint cream, $\frac{1}{2}$ lb. tin condensed milk (unsweetened), $\frac{1}{2}$ pint milk, vanilla essence. Place the sugar, glucose, and milk in a large pan, melt, and boil to 250°. Carefully add cream, and boil continuously to 280°. Stir all the time. At 280° gently stir in the vanilla, and pour into an oiled tin (olive oil) to the depth of about $\frac{1}{2}$ in. Mark deeply with an oiled knife into 1 in. squares before the mixture is set. When cold, cut it right through and twist up the squares in waxed papers. Chocolate caramels are similarly made by stirring in about $\frac{1}{2}$ lb. plain melted chocolate.

For soft vanilla caramels, take 2 lb. white sugar, $\frac{1}{2}$ lb. Barbados sugar, $\frac{1}{2}$ lb. glucose, 1 quart cream, 2 oz. coco butter, 1 pint water, vanilla essence. Melt as before, and add cream gradually at 250°. Slowly boil to 255°, stirring continuously. Just before removing the pan from the stove, stir in the essence. Pour on the oiled tin, mark off, and wrap up when cold.

To make coffee caramels, melt 1 lb. loaf sugar and 6 oz. glucose in a pan containing a small teacupful of water, placing the pan at the side of the stove or over gentle heat so that the process is slow. When the whole is reduced to liquid, boil it to 245° F., then add 3 oz. butter and enough coffee essence to give the desired flavour. Continue boiling without stirring the mixture, and when it has reached 245°-250°, pour it into a well-oiled tin, cutting it into squares when almost cold, with an oiled knife or a caramel cutter.

Fudge. This type of toffee sweetmeat is of American origin and instructions for making two kinds are given in page 493. Vanilla chocolate fudge requires the following ingredients: $\frac{1}{2}$ lb. granulated sugar, 4 tablespoonfuls cocoa powder, 2 tablespoonfuls butter, 1 dessertspoonful golden syrup, small tin unsweetened condensed milk, about $\frac{1}{2}$ teaspoonful vanilla essence.

Blend the cocoa with the condensed milk to a smooth paste and add gradually to the



Fig 3. Russian toffee a very rich variety

melted butter in a small bright saucepan. Add the sugar and syrup, and stir while the mixture is set up. Allow it to boil until a little dropped into cold water hardens to the desired consistency. Add the vanilla essence to the mass, beat it up well, and then put it into a nougat frame lined with waxed paper to set.

Another recipe requires 1 teacupful brown sugar, 1 dessertspoonful golden syrup, 1 teacupful finely grated chocolate, 1 teacupful milk (half milk and half cream is used for a richer fudge). A dessertspoonful glycerin, $\frac{1}{2}$ teaspoonful vanilla essence, and 1 oz. butter. Place the sugar, butter, milk, and syrup in a saucepan, and bring to boiling point. Add the glycerin and boil rapidly for 10 minutes, and stir in the chocolate. Continue boiling, and test in cold water. Turn into an oiled tin, and mark into squares when almost set.

Humbugs. These old-fashioned sweetmeats are also called bull's eyes, and are made from pulled toffee cut into the shape known as a cushion. (See the directions for cutting boiled sweets in this manner given in page

1232.) To make, dissolve $\frac{1}{2}$ lb. brown sugar and $\frac{1}{2}$ lb. loaf sugar with not quite $\frac{1}{2}$ pint water in a strong pan, the pan must not be tinned inside. When the sugar is melted, add 2 tablespoonfuls glucose, and boil to the soft ball, then by degrees put in $1\frac{1}{2}$ oz. butter cut in thin slices.

Boil again till the toffee will snap. This can be tested by dropping a little of the syrup into cold water and breaking it between the thumbs; it should harden at once and break with a crack. Pour the toffee mixture, with the exception of about two tablespoonfuls, on to an oiled marble slab. Then drop in essence of peppermint to taste. It is impossible to give exact quantities of essence required, because the strength varies in all essences.

Turn in the edges of the toffee as soon as it can be handled, and pull it until it is a light cream colour. It can be pulled with the hands, or thrown repeatedly over a candy hook, as explained in the directions for making rock in the article on Swets. The toffee will take about 10 min. to pull. The remaining toffee should be kept liquid in the pan over hot water.

When the pulled toffee is ready, turn the clear liquid on to an oiled dish. Take up small pieces and stretch them in thin strips; lay them along the pulled sweet, which should be in even lengths; straighten the length out, and cut into cushions with a strong pair of scissors. The humbugs should be cream, with pale brown transparent strips.

TOFFEE PUDDING. To make this, take 10 oz. self-raising flour, 3 oz. butter, 2 oz. granulated sugar, and $1\frac{1}{2}$ oz. each of shredded suet and lard. Make a short crust with the flour, suet, and lard, and a little water, and roll it out to $\frac{1}{2}$ in. thick. Next, cream the sugar and butter together, and spread the mixture on the pastry, which should then be rolled up and both ends securely fastened. Put it into a pie dish, and bake it in a quick oven for 35 min. As the butter and sugar ooze out of the pastry, use them to baste the roll, on which they will form a toffee-like surface.

TOILET. Cleanliness and neatness are the chief factors of success in the everyday toilet which achieves a well-groomed appearance. Well-brushed and cared-for clothes, clean linen and footwear, immaculate hands and hair, are most important. The morning toilet for those who go to business away from home should be particularly efficient.

After a few exercises, and thorough brushing of the hair, a warm bath concluded by a cold shower, or sponge down, and followed by a brisk rubbing with a loofah or bath brush, and drying with a rough towel, has an invigorating effect on most people. A good rubbing with the towel across the back of the neck and behind the ears stimulates the circulation.

When housework has to be done at home, most women complete the toilet afterwards. A cap should be worn to protect the hair from dust while sweeping, and the hands should be protected by rubber or wash-leather gloves when possible.

Articles for the toilet, such as hair brushes, tooth brushes, sponges, soaps, powders, creams and lotions, should be of the best quality. It is a mistake to economise on these things. In particular, powders and soaps for the baby's toilet should be absolutely pure. Should a wrong soap have been used, that is, one in which there is free alkali, and irritation of the skin has been caused, gently rub in a little pure olive oil. The powder should contain no white lead, and the puff should be kept scrupulously clean. See Baby: Beauty Culture. Hair: Shaving: Soap: etc.

Toilet Cover. See Duchesse Cover.
TOILET MIRROR. Of the toilet mirror as a distinct article of furniture there are many varieties. Some are fitted into a frame and

swing between a pair of supporting columns with a cross-piece between, or perhaps with a base in which is a drawer. Others have a flap that lets down in front and rests upon supports that pull out. The frame may be of mahogany, walnut, or the cheaper woods. Some are inlaid with a line of satinwood, while others are hand painted or lacquered in black, green, red, or yellow, with raised designs gilded and lined with black in the Chinese style. Triple mirrors are also made, either framed or frameless. (See pages 390, 391.)

Toilet mirrors can be placed on any table or chest of drawers, provided it is a suitable height. For a mahogany piece a plain Chippendale design is perhaps more suitable. Mirrors with only a frame, or only a frame with a box or shelf at the base, are frequently very useful for hanging on the walls of bed rooms, bathrooms, and dressing-rooms. Sometimes these are hung above a dressing-table. Others are fixed to a door or the inside of a wardrobe door.

Many of the mirrors made to-day are reproductions of 18th-century pieces, and a typical example is here illustrated of Queen Anne style in walnut with gilt gesso decoration. Most of these mirrors swing from uprights that rise from bases having three trunket drawers, this being a pattern that has been much copied. Their frames have a decorative shaping at the upper part, and occasionally a cresting such as is seen on the wall mirrors of the period. Some of these are inlaid with veneers, and occasionally two or even three sets of drawers, one above the other, are in the lower part.

A magnificent example of Queen Anne work is in the Victoria and Albert Museum, London. It is of pinewood, and is decorated with gold lacquer in the Chinese style on a green ground. Below the glass, which is in a rectangular frame, are small drawers and pigeon holes very like those in a bureau, the resemblance being carried further by the presence of a lid that, when open, serves also as a desk.

Later, in mid-Georgian days, many oval toilet mirrors were made. The example here illustrated with the cut-glass toilet set is typical of the mahogany style in vogue, with its curved support, and lower part inlaid with satinwood lines, bow-fronted, and having three drawers. See Bathroom; Dressing Table; Mirror; Queen Anne Style; Silvering.

TOILET SET. A toilet set usually refers to the collection of articles that stand on the dressing-table, and the toilet service to those that stand on the washstand, although the two are sometimes confused. The usual constituents of a toilet set are a brush tray, two scent bottles, a powder jar or bowl, ring stand, and one or two small vessels for holding cold cream, etc. A beautiful set in modern English cut crystal is here illustrated,



Toilet Mirror in Queen Anne style, made of walnut and decorated with gesso work
Courtesy of M. Morris & Sons

in which a pair of candlesticks is also included.

Sometimes the whole equipment of a dressing table, including hair brushes, etc., is bought to match. In silver, for instance, the articles can be chosen in a plain or in an engine-turned pattern, with silver tops to jars and scent bottles. Dark or blond tortoise shell, either quite plain, with gold or silver monogram, or with inlaid pattern in gold or silver, is used for beautiful inclusive services, and so is enamel either in delicate or rich colourings.

Ebony and ivory brushes can be used with glass accessories. Trays, powder bowls, and boxes can be had to match, and also shoe lifts and buttonhooks. Lacquered services give a distinctive note to a dressing

table, and a number of pieces can be obtained to form complete sets.

When two distinct sets are used on a dressing-table they should harmonise. For instance, a cut crystal set composed of tray, powder bowl, scent bottles, etc., looks well with silver; red or amber glass with ivory or ebony; gold-decorated glass with tortoise shell. Dressing-table sets in patterned china are less used than formerly; more often now they are in plain colours. There is a large variety of cheap but attractively designed toilet sets available in plastic materials. See Dressing Table.

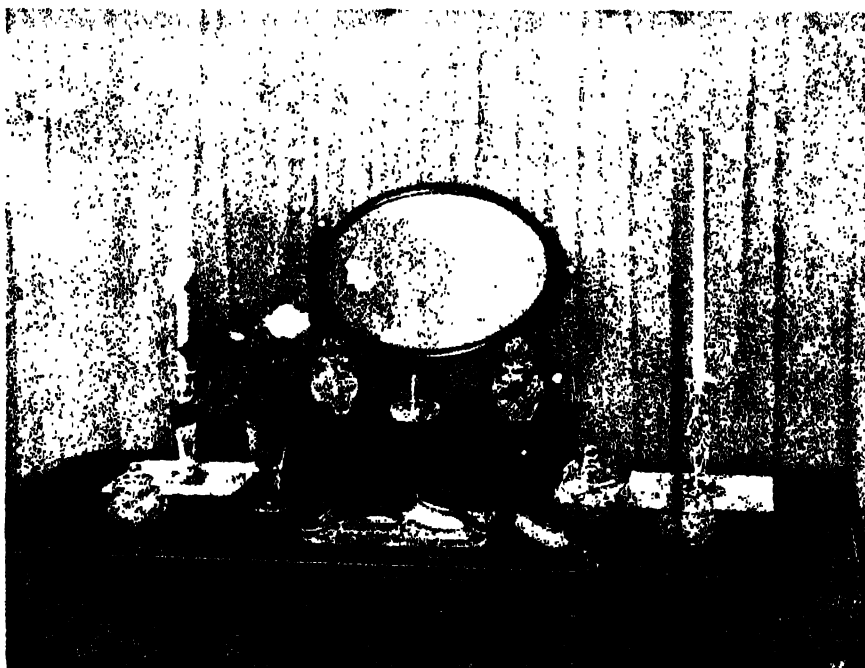
TOILET SOAP. This is a general name for soaps that are made for personal use, as distinct from those for household and laundry work. Toilet soap is generally scented; but a strong scent is not always to be recommended, because it sometimes serves to disguise the odour of chemicals and inferior fats used in the manufacture. The best toilet soap lathers well, cleanses the skin without making it rough or coarse, and is faintly perfumed. See Soap.

TOILET VINEGAR. Glacial acetic acid or acetic ether when it is added to a toilet water forms a toilet vinegar which has refreshing properties when inhaled. A small sponge soaked with this aromatic vinegar was placed in an ornamental box called the vinaigrette, and was in general use as a smelling bottle in the 17th and 18th centuries. The vinegar is now sold in various perfumes, such as Cologne, lavender, millefleurs, and violet. A few drops sprinkled on a handkerchief are inhaled or the handkerchief is bound round the forehead, to relieve headache.

TOKAY. This sweet and world-famous wine with an aromatic flavour is made from several kinds of grape in Tokay, Hungary. The distinguishing characteristic of Tokay which gives it a value as a medicinal agent is the quantity of phosphoric acid it contains. Tokay is fragrant, golden, soft, and oily. Authentic Tokays are rare. See Wine.

TOKEN: How to Collect. To form the nucleus of a localised collection of tokens is not by any means difficult or even expensive. To begin with, the collector must learn how to recognize a genuine currency token when he sees one. Every metallic currency token is a coin, but a coin of a distinctive character. It is a redeemable coin issued by cognizable authority to circulate at a higher value than that of the metal it contains. The so-called silver and bronze coins now minted in Great Britain are regal or national tokens.

Tokens of Three Periods. For the purpose of the amateur collector, it will be sufficient to restrict these hints to such as concern the issues of localised non-regal currency tokens taking place in Great Britain during the three periods 1648-72, 1787-99, and 1811-15. Most of these issues were in copper, but the third period included numerous examples in silver



Toilet Set. Modern English cut-glass toilet accessories look their best on a polished mahogany dressing table, as illustrated in this photograph
Courtesy of Webb & Corbett

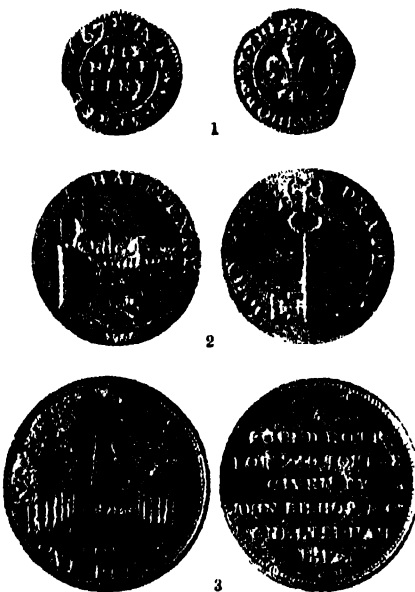
and some, such as those of Reading and Sheffield in gold.

Tokens of the first period are generally thin pieces of copper, or other base metal, about the size of a sixpence, and forgeries are seldom met with. About 20,000 varieties of these quaint little tokens are believed to have been struck, but only about half that number are extant. These are catalogued in counties in a work by the late William Boyne, which may be consulted at any large public library.

The second and third periods exhibit better workmanship on more substantial disks of metal, and contain many private tokens, that is to say imitation tokens issued by collectors for exchange with other collectors. These private tokens are not currency tokens, and good authorities, such as Charles Pye, have noted and distinguished all the private tokens of the second period.

Other more or less spurious pieces of the two later periods are: The several series of public buildings (notably at Coventry, Birmingham, and London, and in the scattered series with a globe on the reverse) made by coin dealers for sale to collectors; political and satirical pieces, such as Spence's, and medallions all easily distinguishable by their designs and legends; mules, so called from each being struck from two dies never originally intended to be combined for one coin; non-local tokens manufactured in mass by die-smiths to sell to traders, who profitably circulated the stuff without liability for redemption; any apparent token not bearing clearly the name of the issuer and the place of origin or redemption.

The most confusing of the spurious pieces are the mules of the second period. Ex-



Token. Obverse and reverse of tradesmen's copper coins issued in Great Britain. 1. London Jewin Street halfpenny, 1867. 2. Swansea halfpenny 1796. 3. Cheltenham penny, 1812.

perience, however, and a reference to Charles Pye's volume of plates, will soon train the collector's eye to reject spurious pieces. Mules of the third period are comparatively scarce. See Coin Collecting.

TOMATOES: GROWING AND COOKING

With Recipes for Some Tasty and Economical Dishes

This contribution deals first with the growing of this useful plant, the section including some information about the diseases to which it is subject. Information about various ways of cooking the fruit follows. See Dishwashing; Greenhouse; Kitchen Garden; Omelette; Salad; Snow Fl.

This half-hardy plant, of which the fruits are used as vegetables, has increased enormously in popularity in recent years and immense quantities are sent to market. It can be grown to produce fruit throughout spring and summer under glass and out of doors in summer.

For summer fruiting it is raised from seeds sown in a heated greenhouse in February; the seedlings are potted singly in small pots in a compost of loam and leaf-mould, and subsequently in 5 in. pots in loamy soil. The plants should be grown in a temperature of about 50 degrees, the greenhouse being ventilated freely in mild weather; close, moist conditions will lead to failure.

Early in June tomato plants may be planted out of doors: a border at the foot of a sunny wall or fence is the most suitable. The soil should be dug deeply but not manured and must be trodden firmly; tomatoes do not thrive in loose soil. The plants are set about 2 ft. apart and are supported by strong stakes. All side shoots must be rubbed off to restrict each plant to a single stem. When the first fruits are set, superphosphate of lime at the rate of 2 oz. per square yard of ground should be applied and forked beneath the surface. The tops of the plants should be cut off when three or four bunches of fruit have set.

If the summer happens to be dry and warm tomatoes will do well in the open garden, but in a dull, wet season they are likely to prove disappointing.

For cultivation under glass the plants in 5-in. pots should be repotted into those 9 or 10 in. wide, or planted in a border of loamy soil not more than 12 in. deep and made firm by treading. The stems must be supported by stakes. The secret of success is to keep the plants as cool as possible and the soil moderately moist. Free ventilation is necessary. When the fruits are well developed

superphosphate of lime and liquid manure may be given alternately once a fortnight. Great care in watering is necessary, especially if the tomatoes are planted in a border; if the soil becomes sodden the plants are not likely to do well. To produce a crop of tomatoes in spring under glass, seeds should be sown in September.

There are innumerable varieties of tomato almost every seedsmen has his special sorts. Some of the best for cultivation out of doors are Essex Wonder, Bide's Reckit, Best of All, Ailsa Craig, Sunrise and Al. For cultivation under glass, Princess of Wales, Abundance, Scarlet Beauty, and Earliest of All are suitable. The yellow tomatoes, e.g. Golden Perfection and Golden Queen, are more suitable for the greenhouse than for out of doors.

Tomato Diseases. The chief diseases which affect tomatoes are black spot, sleeping disease, and yellow spot or stripe. Black spot attacks the eye of the fruit and causes it to crumple up and decay. Sleeping disease attacks the leaves of the plants. It causes them to lose their freshness of colour and droop, with the result that the whole plant ultimately perishes. There is no effective remedy, and affected plants should be destroyed. The house in which the pest is found may be disinfected by a spray of a solution of sulphate of iron.

Stripe is mainly a disease of plants grown under glass, but it has been seen on those grown in the open in a position facing south and sheltered by a high wall. The symptoms are dark, vertical stripes on the stems, brown sunken patches on the fruit, and brown shrivelled areas on the leaves. The disease frequently occurs in the seed bed, producing rapid destruction of the plants and necessitating fresh sowings.

The varieties of tomatoes differ very much in their susceptibility to disease. Generally

speaking, those varieties that show rapid, soft growth in the early stages are most susceptible to stripe. Manure has considerable influence upon this susceptibility. As with other diseases, excessive quantities of nitrogen and a lack of potash tend to lower the resistance power of the plant to the invasion of the parasite. The effect of too much nitrogen can be largely counteracted by an increase in the amount of potash. Sterilization of the soil by heat should be practised when an attack has occurred. Dry air conditions should be maintained under glass. Soil infected by eelworm ought to be removed from the glass-house and replaced by fresh soil.

How to Cook. Tomatoes that have been picked before they are ripe may be used to make chutney, but if it is desired to ripen them they should be placed in rows on a shelf in a warm room or where the sun can reach them. A little space should be left between each otherwise they will become soft. Tomatoes too soft for serving whole, but only ripened and not over-ripe, may be used for stews and soups, but those that are to be served raw should be firm and unbroken. Tomatoes give a good flavour to stewed beef and mutton. To peel tomatoes without damaging the pulp, dip them in boiling water for a few seconds, and the peel will then come away easily. They should not be left in the water too long, otherwise they will become putridly cooked.

Boiled tomatoes can be served either as a substitute for, or in addition to, a green vegetable. To prepare them, wipe them with a clean cloth, pull off the stalks, and drop them into a saucepan of lightly salted boiling water. Boil them slowly for 5 min. or a little longer, then drain them, place a few small pieces of butter on them, season with pepper and salt, and serve in a hot vegetable dish.

Breakfast Dishes. Grilled tomatoes are excellent with bacon or sausages. Cut each tomato in half, season with pepper and salt, and place it under the grill. Fried tomatoes served on slices of fried bread are also a good breakfast dish. Fry the bread in some hot dripping, then cut the tomatoes into halves and fry them in smoking hot fat until they are tender. Serve three or four halves on each piece of bread, according to its size.

Tomatoes stuffed with fish can be made thus: Choose 1 lb. firm, even-sized tomatoes,



Tomato. Fine fruit of the variety Sunrise

with a sharp knife cut a round piece from the stalk end of each, and scoop out some of the soft interior, reserving the pulp. Take the skin and bones from $\frac{1}{2}$ lb. cooked dried haddock, break up the flakes, and mix them with a large tablespoonful of boiled rice, a tablespoonful of chopped pickled gherkins, a chopped hard-boiled egg, 1 oz. melted margarine, the tomato pulp, and seasoning to taste. If the mixture is too dry, a little milk may be added. Fill the cavity in each tomato with this stuffing, heaping it slightly on top. Sprinkle over some browned breadcrumbs, then bake the tomatoes in a moderately hot oven until they are tender, but not broken. Have ready a croûton of fried bread for each tomato, placing the latter on top and serving very hot.

Devilled tomatoes, served on squares of grilled ham are prepared thus. Cut 3 or 4 tomatoes into thick slices, and spread each slice with a mixture made by seasoning a piece of margarine about the size of a hen's egg with mustard, pepper, salt, and cayenne. Bake the slices on a tin in a moderately hot oven, and serve them as has been already stated.

mixture thoroughly hot, put it into a pie-dish, and place the slices of cooked tomato on top. Serve sprinkled with chopped parsley.

A savoury supper or luncheon dish is provided by tomatoes au gratin. To prepare it, mix $\frac{1}{2}$ lb. breadcrumbs with the same quantity of grated cheese, and shake a layer of them into the bottom of a greased fireproof dish. Cover them with some thick slices of tomato and a little chopped onion, add a sprinkling of pepper and salt, and continue these layers until the dish is full. About 2 lb. tomatoes will be required. The last layer, which should be a fairly thick one, should be of cheese and crumbs. Put 3 or 4 small pieces of margarine on top, and bake the whole in a hot oven until the top is browned. The dish should be sent to table immediately it is ready.

Tomato Chutney. To make this chutney, put 6 lb. sound tomatoes into a large enamel pan, break them with a wooden spoon, and then add $1\frac{1}{2}$ lb. apples cut into quarters but not peeled or cored, 3 small onions peeled and minced, 1 oz. crushed mustard seeds, $\frac{1}{2}$ oz. ground ginger, 4 oz. salt, a small teaspoonful of cayenne, and $1\frac{1}{2}$ pints malt vinegar.

Bring all these to the boil, then simmer them until they begin to soften. Add 1 lb. moist sugar, stir until it dissolves, and then continue simmering until the tomatoes and apples are a soft pulp. Rub them through a hair sieve, stir them well, and bottle the chutney in two days' time.

Tomato Jam. This vegetable jam can be made by wiping and stalking 6 lb. tomatoes, cutting them into slices, and putting them in a preserving pan with $1\frac{1}{2}$ pints water. Cook them slowly until they are tender, then rub them together with the water in which they were cooked, through a sieve. Put the purée

back into the pan with 5 lb. sugar and the strained juice of six lemons.

Bring the whole to the boil, remove the scum, add the grated rind of the lemons, and continue boiling for about 45 min. or until the mixture forms a jelly. Stir the jam occasionally to prevent it from burning, and skim it whenever necessary. When it is sufficiently cool turn it into pots, tie it down when quite cold and store in a dry, cool place.

Tomato Ketchup. For this relish 4 lb. tomatoes, $\frac{1}{2}$ lb. onions, $\frac{1}{2}$ oz. each whole ginger, cloves, and allspice, a gill of vinegar, and a little salt are needed. Cut the tomatoes in halves, place them on a dish with the cut sides upward, and sprinkle them with salt. Leave them thus for 24 hours, then put them into a pan and simmer them until the skins become loose. Strain them through a coarse sieve, and to the liquid add the minced onion, the ginger cut into small pieces, and the pounded cloves and allspice. Turn all into an enamel pan, and boil them until they are reduced by one-third. Add more salt, if necessary, and when the ketchup is cold strain it into bottles. Store it in a dry, cool place.

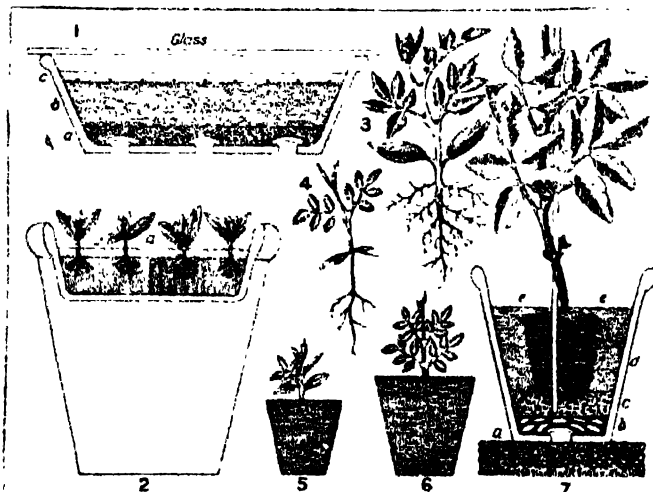
Tomato Omelette. A savoury omelette, with tomato and onion as flavouring ingredients can be made thus. Melt $\frac{1}{2}$ oz. butter or margarine in a small frying-pan, and fry in it a skinned tomato cut into slices, and 1 teaspoonful chopped onion. In the meantime, separate the yolks from the whites of 2 eggs, beat up the former, adding salt and pepper to taste, and a teaspoonful of grated cheese. Whisk the whites with a pinch of salt to a stiff froth, and fold them lightly into the yolks.

Melt $\frac{1}{2}$ oz. margarine in an omelette pan, and when it is hot pour in the egg mixture, stirring it round to prevent it from sticking to the bottom of the pan. When it begins to set, place the hot tomato and onions in the centre, and finish the omelette in the usual way.

Tomato Sauce. Tomato sauce for serving in place of gravy can be prepared with fresh or tinned tomatoes. Weigh out $\frac{1}{2}$ lb. tomatoes, wipe them and cutting them into slices if they are fresh; then put them into a saucepan with an onion and a carrot, peeled and sliced, $\frac{1}{2}$ oz. margarine, $1\frac{1}{2}$ gills stock or water, $\frac{1}{2}$ teaspoonful celery seeds tied in muslin, a teaspoonful sugar, and pepper and salt to taste. If tinned tomatoes are used, only 1 gill stock will be required.

Cook the whole slowly until the vegetables are tender, then take out the celery seeds and rub the sauce through a hair sieve. Put it back into the saucepan, thicken it with a teaspoonful of corn flour mixed to a smooth paste with a tablespoonful of cold water, and then let it boil slowly for 5 min., stirring all the time.

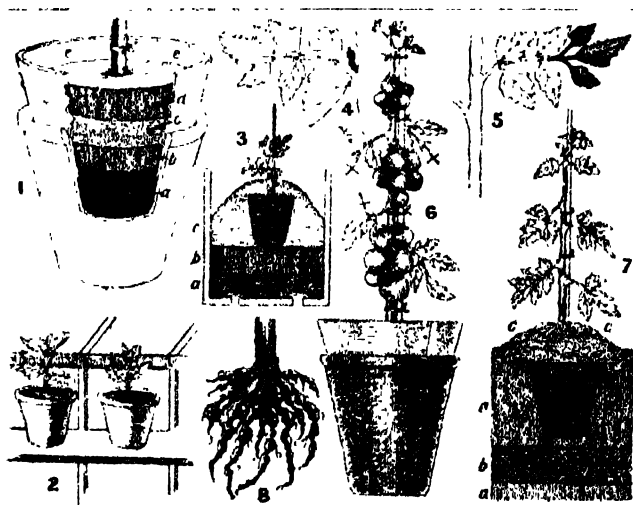
Tomato Soup. To make tomato soup, put into a frying pan $\frac{1}{2}$ oz. ham or bacon, cut into dice, and 1 oz. margarine. Fry in this for 5 min. a carrot, a turnip, 3 sticks of celery or a little celery seed, and a bouquet garni; then add 2 lb. ripe, or $\frac{1}{2}$ lb. tinned tomatoes. Let all simmer for 20 min.; after wards remove the bouquet and pass as much as possible of these ingredients through



Tomato culture. 1. Seed sowing: a, turf; b, compost; c, fine, sandy soil. 2. Seedlings transplanted to large pot with topping of sand (a). 3. Good fruting type. 4. Poor seedling of little use. 5 and 6. Successive pottings of seedlings. 7. Fruiting plant finally potted: a, turf; b, crocks; c, chopped turf; d, compost; e, space for top dressing by special arrangement with Amateur Gardening

Tomato Savouries. Tomatoes stuffed with a mixture of breadcrumbs, herbs, and grated cheese make excellent savouries. To prepare them, cut a small, round piece from the tops of five tomatoes and scoop out a little of the insides. Mix 5 dessert-spoonfuls fine breadcrumbs with 1 teaspoonful chopped parsley, a pinch of mixed herbs, $1\frac{1}{2}$ teaspoonfuls grated cheese, a chopped truffle, and a peeled, chopped and fried onion. Melt 1 oz. margarine, add it to the mixture with the yolk of an egg, and then use the whole to stuff the tomatoes, plugging it up well on top. Bake the tomatoes on a greased baking sheet in a moderately hot oven until they are tender, but do not let them break, and when they are cooked take them from the oven, sprinkle a little grated cheese over the top of each, and brown beneath a gas grill.

A tomato and rice savoury can be made by wiping two tomatoes, cutting them into slices, and putting them in a baking tin in the oven with a little dripping. Cook them until they are tender, and in the meantime wash and boil a teaspoonful of rice until it is soft. Mix 2 oz. margarine in a saucepan, fry a peeled and chopped onion in it, then stir in the drained rice and 3 oz. cooked and chopped ham. Add seasoning to taste, stir all together, and then mix in two gills of tomato sauce. Make the



Tomato culture (continued). 1. Top dressing: a, original soil; b, c, and d, successive top dressings; e, ridge collar to accommodate same. 2. Positions for seedlings to encourage sturdy growth. 3. Box planting: a, leaves; b, firm soil; c, prepared soil and compost. 4. Growth to pinch out. 5. Leaf reduction to avoid shading of fruit. 6. Defoliation of plant in detail. 7. Out-door planting: a, soil; b, manure; c, mulch. 8. Roots damaged by eelworm

a hair sieve. Have ready at boiling point a pint of good, well-seasoned stock, which should be thickened with $\frac{1}{2}$ oz. cornflour made into a thin paste with some stock. Add the purée to the stock, and, if required, a squeeze of lemon juice and some more seasoning. Boil up and simmer for 10 min., stirring well. Fresh tomatoes may need rather more stock than the amount mentioned.

TON. This measure of weight consists of 2,240 lb. or 20 cwt. It is used for weighing coal and other heavy materials. See Avoir, dupois Weight.

TONGS: For Household Use. Tongs are appliances for gripping and moving any object with safety or comfort, and without soiling the hands. In their general form for household use, in moving coal from the scuttle to the fire, they consist of a pair of levers pivoted at one end, or with an open spring loop, their length depending upon the purpose for which they are required. The longer varieties have a handle fitted at the end at which they are pivoted. These are now seldom used, but are still seen in ornamental brass and steel as a decorative finish to period fenders or curbs of the same metal. Tongs are a component part of a set of fire irons. (See page 453.)

TONGS: For Metal Work. Special tongs are used to hold iron pipes in gas and hot water fitting. The gas tongs illustrated in Fig. 1 is a convenient tool for gripping gas piping without damaging the pipe. It is made of forged steel and is fitted at the gripping end. One end is curved to encircle the pipe, while the other end is short and has a sharp, square inner edge which bites into the softer metal of the pipe, thereby holding it securely. Tongs of this type are made only for one size of pipe.

A further application of tongs is found in the blacksmith's trade. These invariably take the general form of those illustrated in Fig. 2, the salient feature being that their handles are long compared with their gripping ends, in order that great leverage, and therefore gripping powers, may be applied. The larger of the two pairs illustrated is made primarily

of 40. Predisposing causes include decayed or broken teeth, badly fitting dental plates, excessive smoking, and anything that sets up inflammation or irritation.

Acute inflammation or acute glossitis is most often caused by wasp stings, or stings and bites of other insects; also by burns and scalds and by wounds which become septic. Treatment would be directed by a doctor.

The commonest cause of chronic inflammation are syphilis, tobacco smoking, drinking alcohol not sufficiently diluted, decayed teeth, and previous attacks of acute inflammation.

Ulcers of the tongue may arise from injury or dyspepsia. The former variety is generally due to decayed teeth or badly fitting artificial teeth. The ulcers due to dyspepsia are generally on the tip and upper surface.

Wounds are most commonly caused by jagged teeth, but may be caused by the person biting his own tongue, or by instruments or weapons. If bleeding is very free, try to grasp the wound firmly between the fingers while awaiting the doctor. Otherwise give ice to be held in the mouth.

Tongue as an Aid to Diagnosis. The state of the tongue varies in different diseases, as the following particulars will show. In chronic dyspepsia the tongue is often swollen flabby, and coated with fur, which may be white yellowish brown, and sometimes black. In

acute gastritis the fur is whit but does not extend to the tip and edges of the tongue, which are bright red. In prolonged constipation the



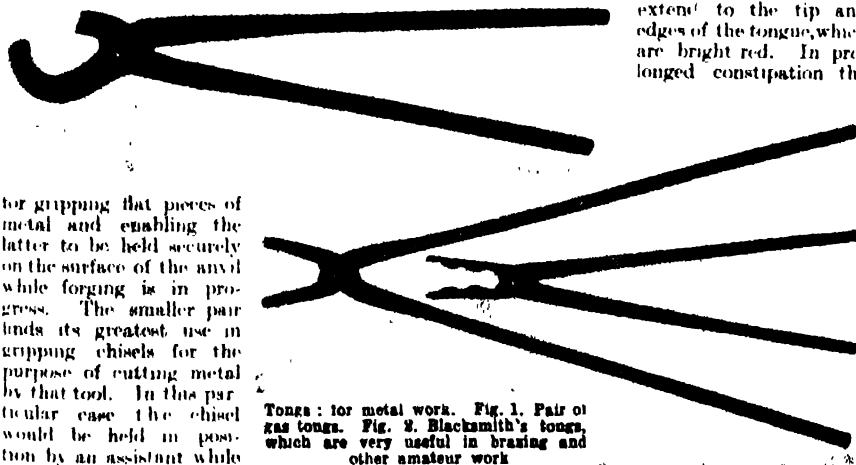
Tongued joint, fig. 1. Plane used in preparing tongue. Fig. 2. Use of grooving plane

however, needs longer soaking and very slow cooking. Pigs' tongues are prepared in the same way as sheep's tongues. Cold tongue, either alone or with salad or cold cooked ham, makes a particularly good luncheon dish, and, like most other cold meats, can be made into sandwiches. It may also be potted.

There are various ways of serving cooked tongue when a hot dish is needed. If minced, combined with breadcrumbs, and heated up, for instance, it makes excellent savouries. Pass the tongue through a mincing machine; then pound it with about one-third its quantity of breadcrumbs and enough sauce to bind it. Season it with cayenne and a little lemon juice and rub the whole through a sieve before heating it over a slow fire. When it is thoroughly hot, pile it high in some newly-fried cases of bread and garnish each savoury with a little parsley.

Another method of heating up cold tongue is to cut it into neat slices, season them to taste, sprinkle them with lemon juice, and let them stand for a while before dipping them in egg, coating them with breadcrumbs and then frying them to a golden brown colour in smoking hot fat. Serve them at once, garnished with parsley and thin slices of lemon. See Calf's Head; Ox Tongue; Potted Meat; Sheep's Tongue.

TONGUED JOINT. This is a joint in which a small projection along the length of one part, known as the tongue, fits into a slot or groove in the other part and so completes the joint. A common application is found in tongued and grooved floor-boards. This material is finished on one side and generally measures in width 4 in. to 5 in. The average thickness is nominally 1 in., but actually it measures slightly over $\frac{1}{2}$ in. Thicker boards are available, but are seldom used except in high-grade work or where very considerable strength is needed, ordinary 1 in. tongued and grooved flooring being quite satisfactory for most domestic work. The amateur will find that this class of timber with its tongued



Tongs: for metal work. Fig. 1. Pair of gas tongs. Fig. 2. Blacksmith's tongs, which are very useful in bracing and other amateur work

for gripping flat pieces of metal and enabling the latter to be held securely on the surface of the anvil while forging is in progress. The smaller pair finds its greatest use in gripping chisels for the purpose of cutting metal by that tool. In this particular case the chisel would be held in position by an assistant while the blacksmith applied the hammer. See Casting; Pipe, Plumbing; Spanner; Wrench.

TONGUE: Its Diseases. The tongue is composed of a number of different muscles the fibres of which run in various directions. Over the surface are scattered numerous small, reddish, pointed projections, which have to do with the sense of taste. The chief duties of the tongue, in addition to acting as the organ of taste, are to assist mastication, swallowing, and the pronunciation of words.

Amongst diseases of the tongue is cancer, which is about six times as common in men as in women, generally occurring about the age

tongue is coated with a thick white or brownish fur. In fevers the tongue is usually dry, but when furred the colour is yellowish or brownish. In typhoid fever the middle is covered with thick brown fur, the colour becoming yellowish towards the edges. In scarlet fever the tongue is swollen and covered with white fur, with scattered bright red spots, the inflamed papillae. This is known as the strawberry tongue. In thrush, common in very feeble children, the tongue is covered with raised white spots and small patches. In debilitated states the tongue is often found to be large, pale, and flabby.

joint is extremely useful for a great many purposes.

In the construction of tongued joints, a tonguing and grooving plane is usually employed, such as that illustrated in Fig. 1, which has variously shaped irons and adjustable fences, and makes grooves $\frac{1}{4}$ in. in width. On one side is an adjustable fence composed of a strip of hardwood which locates the position of the groove in respect to the working face of the material.

The method of using this plane, as illustrated in Fig. 2, consists of securing the work in a vertical position on the bench between blocks of wood or by holding it in the bench vice. The plane is rested on the upper surface of the work with the fence resting against the face, and worked backward and forward in the usual way. The tongue can be made with the same plane, and finished by the regular tonguing and grooving plane or matching plane, specially prepared for the purpose. The plough plane is also used for this class of work.

Tongued joints are found in many kinds of woodwork, particularly in cabinet work and the better quality joinery. Examples are also seen in metal-work. In both cases they are akin to the feathered joint, except that, instead of using a separate strip and sinking it into a groove in each piece of material, the joint is formed from the solid. For woodwork the tongued joint forms one of the best methods for jointing the edges of long pieces of material, and when well cramped up and supported by cross battens it makes a particularly rigid structure. See Joint Plane.

TONIC. Drugs or mixtures of drugs which increase the efficiency of the body as a whole, or of any of its systems, are called tonics. Thus there are nerve, blood, heart, and general tonics. The following are examples of a tonic designed to brace up the nervous system:

Tincture of nuxvomica . . . 1 dram
Spirit of chloroform . . . 1 " "
Water, enough to make . . . 6 oz.
Dose for a grown person: 1 tablespoonful 3 times a day after meals.

Solution of strychnine hydrochloride . . . $\frac{1}{2}$ dram
Iron and quinine citrate . . . 1 " "
Spirit of chloroform . . . 2 drams
Tincture of eximbia . . . 6 " "
Water, enough to make . . . 6 oz.
Make into a mixture. Dose: $\frac{1}{2}$ to 1 tablespoonful in a little water 3 times a day after meals.

The following are examples of tonics directed towards improving the quality of the blood:

Sulphate of iron . . . 15 gr.
Sulphate of quinine . . . 4 " "
Dilute sulphuric acid . . . 40 minims
Simple syrup . . . 1 oz.
Water, enough to make . . . 8 " "
Make into a mixture. Dose for a grown person: 2 tablespoonfuls 3 times a day after meals.
Sulphate of iron . . . 10 gr.
Magnesium sulphate . . . 1 oz.
Dilute sulphuric acid . . . 1 dram
Glycerin . . . 6 drams
Water, enough to make . . . 8 oz.
Make into a mixture. Dose for a grown person: 2 tablespoonfuls 3 times a day. This prescription is appropriate when there is any tendency to constipation.

The following is an example of a bitter tonic often very valuable where the patient's appetite is capricious and he is run down:

Tincture of nuxvomica . . . 2 drams
Iron and quinine citrate . . . 1 " "
Dilute phosphoric acid . . . 1 " "
Tincture of orange . . . 2 " "
Chloroform water, enough to make . . . 4 oz.
Make into a mixture. Dose: 1 to 2 teaspoonfuls an hour before each meal.

The following is an example of so-called simple digestive tonic mixtures:

Tincture of cascarella . . . 1 oz.
Dilute hydrochloric acid . . . 3 drams
Syrup of orange . . . 1 oz.
Water, enough to make . . . 8 oz.
Make into a mixture. Dose for a grown person: 2 to 4 teaspoonfuls 3 times a day.

One of the best all-round tonics for general debility is Easton's syrup, dose, $\frac{1}{2}$ to 1 dram

3 times a day after meals. No tonic should be taken for longer than a month or 6 weeks at a stretch, as otherwise it may upset the digestion, also losing its original efficacy.

TONING: In Photography. Toning is a method of changing the colour of a photographic print after development and after or before fixing. Whether on P.O.P. or bromide paper, all prints which include a silver salt in the light sensitive film can be toned. Prints made on P.O.P. by daylight invariably need toning, as otherwise the colour is not pleasing. Prints made on gaslight or bromide papers are only toned when it is desired, from black and white to warmer colours or tints.

Many varieties of P.O.P. have toning chemicals included in the film on the surface of the paper, so that when placed in the fixing bath toning is carried on automatically at the same time. These are known as self-toning papers (qv.). With the non-toning printing-out papers the toning process may be combined with the fixing, or the two operations may be carried out separately. The latter is the better course, as when a combined bath is used there is a risk that the print may be removed from the bath before fixing is complete because the desired colour has been obtained. Thus prints, not being sufficiently fixed, will not be permanent.

Toning of P.O.P. This is practically always carried out with a salt of gold, although warm black tones can be obtained by using platinum compounds. Both agents are extremely expensive but are only required in minute quantities. The gold is used in the form of gold chloride, sold in tubes containing 15 gr.

The following are standard formulae for gold toning the common gelatino-chloride papers.

GOLD STOCK SOLUTION
Gold chloride . . . 15 gr.
Water . . . to 10 oz.

SULPHOCYANIDE STOCK SOLUTION
Ammonium sulphocyanide . . . 100 gr.
Water . . . to 10 oz.

For use, mix in the following order:

Stock solution B . . . 2 oz.
Water . . . 10 " "
Stock solution A . . . 2 "

A bath recommended by the Ilford Company for warm tones is the following:

SODIUM SULPHITE SOLUTION
Sodium sulphite . . . 15 gr.
Water . . . to 10 oz.

The toning bath is made up as follows:

Stock solution A . . . 2 oz.
Stock sulphite solution . . . 2 " "
Stock solution B . . . 2 " "
Water . . . to 20 "

Mix in the order given. The sulphocyanide toning bath should not be used more than once. If a large number of prints are being toned at the same time, it will be found necessary to strengthen the bath when toning becomes slow. This may be done by adding small quantities of the following solution, which must be made up as required:

Water . . . 5 oz.
Stock solution B . . . 1 " "
Stock solution A . . . 5 "

All gold solutions work best after they have been allowed to stand for at least 24 hours. This toning bath will give red to purple tones. Before toning P.O.P. in this or other baths, prints must be well washed in water until the washing water shows no trace of milkiness. At least six changes of water are required if running water is not used. This washing removes the soluble silver salts from the paper, which would otherwise act on the gelatine and produce discoloration.

In hot weather it is important to harden the prints before toning. They should be immersed for 10 min. in the following bath and washed thoroughly for 10 min. after hardening. The employment of this alum and salt bath will secure regularity of tone.

Common salt . . . 1 " "
Alum . . . 10 " "
Water . . . to 20 "

Toning P.O.P. may be carried out in weak daylight well away from a window. A large porcelain dish should be used and kept for this purpose only. Prints are immersed in the solution one by one, care being taken that air bubbles do not cling to their surfaces. The prints must be kept in constant motion and must not be allowed to stick together. If these precautions are not observed, unequal toning or stains may result.

While in the bath the prints must be carefully watched, and a little experience is necessary to determine when they should be removed. The colour gradually changes to brown, then to purple, ending with a slaty blue. The shorter the time of toning the warmer or redder the finished print, the longer, the colder or bluer will be the final colour. A cold solution is liable to give muddy tones, whilst a bath which is too warm will give pinkish prints. The temperature should be about 65° F. A bath containing too much gold hastens toning, but gives muddy tones; while a slow bath, due to deficiency of gold or excess of sulphocyanide, gives pinkish tones.

When toning is judged to be complete, prints should be washed at once in running water to prevent continuance of toning. The quickest method of stopping toning is to immerse the prints in a weak solution of sodium sulphite 5 gr. per oz. of water.

Poor negatives will never give good prints on gelatino-chloride P.O.P. Defects in the finished prints are due to the following causes. Handling the prints before toning with moist or greasy fingers will cause red patches. Allowing prints to stick together in the toning or fixing bath, or insufficient washing after the hardening bath, or other stages, causes unevenness of tone. Small quantities of hypo introduced into the toning bath will cause brown discoloration or complete absence of toning. It is, therefore, advisable to complete toning and washing before beginning fixing or otherwise handling hypo solutions.

Combined Toning and Fixing.

If sufficient care is taken to ensure complete fixing, combined toning and fixing will give good and pleasing colours. The prints must be made distinctly darker than when separate toning is carried out, and placed face downward without previous washing, as distinct from the careful washing of separately toned prints, in the combined bath. They must be left in the bath at least 7 min. to ensure fixing; they should not be in more than 10 or 12 min. Following is a good formula:

Water . . . 20 oz.
Hypo . . . 3 " "
Lead acetate . . . 20 gr.
Gold chloride . . . 1 "

Dissolve in hot water in the order given and prepare at least 24 hours before use, shaking well. After standing, decant the clear liquid, allowing $\frac{1}{2}$ oz. for each $\frac{1}{2}$ plate print. Throw away after use. Keep the prints moving.

Sulphide Toning. Gaslight and bromide prints may be toned in a variety of colours. The most popular process is the sulphide method, because of its simplicity, good colours, and permanent results. After fixing and washing, bromide prints should be dried before toning by the sulphide process.

The print is first bleached in the following bath, which can be made up as a stock solution and used until its bleaching powers fail:

Potassium ferricyanide . . . 1 oz.
Potassium bromide . . . 1 " "
Water . . . to 20 "

The solution should be stored in a yellow or brown bottle away from the light. The print bleaches to a faint yellow in a few minutes in this bath, is then rinsed well, not washed too long, and put into a sodium sulphide toning

bath which restores the image in fine brown and sepia tones. Make up a stock solution of 2 oz. of pure sodium sulphide (white, not green crystals), in 5 oz. of water. For use, take 1 oz. of this solution and add 10 oz. of water. The print is toned rapidly, and no variation in colour is obtained by leaving it in after the image is completely redeveloped. Wash thoroughly for about 15 min. in running water. After use, the sulphide solution must be thrown away.

Variations in colour with this process can be obtained by first bathing the print in the sulphide solution, then washing, bleaching in the ferricyanide solution, and finally redeveloping in sulphide solution. To get deep sepia and warm black tones the process is carried out as first described, with the exception that bleaching is stopped before it is complete. The more of the original black image left the deeper will be the final colour.

All the processes described above for bromide papers are applicable to the toning of lantern slides. See Developing; Fixing; Negative Photography; Printing.

TONSIL. The tonsils are two small glandular bodies situated on each side of the back part of the mouth, at its juncture with the throat. Their main function appears to be that of trapping toxic material as it passes backward from the mouth. See Adenoids.

TONSILLITIS. Inflammation of the tonsils is of several types and occurs in an acute and a chronic form. The former occurs most commonly in young people during spring or autumn. People of a rheumatic tendency are more liable to the disease than others. The most common causes blamed for exciting an attack are exposure to cold and damp or to overheated and impure air.

The earliest symptom of acute catarrhal tonsillitis is pain when swallowing. If the tonsils are examined they will be seen to be red and swollen, dry at first and then covered with a layer of mucus mixed with pus. An attack seldom lasts more than a few days. It is often associated with pharyngitis, and may be followed by inflammation of the middle ear.

The symptoms of acute follicular tonsillitis are more severe. The patient should be kept away from other members of the family, as tonsillitis is more or less contagious, and it is not always easy at first to distinguish between an attack of this disease and diphtheria. He should not be allowed to talk or to swallow anything but liquids or semi-solids.

To prevent relapse the mouth and teeth should be cleansed morning and night, some antiseptic mouth wash being used. A good protective measure is to bathe the neck in cold water.

Chronic tonsillitis, popularly known as enlarged tonsils, is usually the result of repeated attacks of the acute form. It is met with mainly in children from 5 to 15 years of age, and is more common in boys than in girls.

Usually the affected child breathes through the mouth, keeping it always open, in consequence of which he has a stupid expression. At night his breathing is noisy and irregular, and he is often the victim of nightmare and night terrors. Cough may be troublesome at night. The patient is especially liable to attacks of nasal catarrh. He continually hawks up mucus from the throat. At times swallowing is painful, and both the sense of taste and the sense of smell are often defective. The hearing also is frequently impaired, and this may develop into complete deafness.

In very slight enlargement, measures to build up the health may be effective in subduing the symptoms and preventing the development of the enlargement. But the correct treatment of diseased tonsils is to have them removed. See Adenoids; Quinsy.

TOOLS FOR THE HOME WORKER

A Selection to Suit All Ordinary Requirements

This contribution gives some detailed advice on the selection and care of tools for simple wood and metal work. Further information about individual tools will be found under such special headings as Chisel, Plane, Saw. See also Amateur Carpentry; Bench, etc.

Prepared collections of woodworking tools often contain some which are seldom used by the beginner, and it is better for the amateur to start with the few indispensable tools and add to them gradually as he acquires dexterity and experience in his hobby. The outfit desirable for simple carpentry will also be adequate for most of the odd jobs which fall to the handyman, if supplemented by a few metal working tools. A start could be made with the following and if desired only those marked with an asterisk (*) need be procured at the outset.

- * Hammer, 16-oz. pattern, 1 lb.
- Ball plane, 1 lb.
- * Panel saw, 24 in.
- * Penon saw, 15 in.
- * Screw driver, London pattern, 9 in.
- * Ret-bat screwdriver, 3 in. blade
- * 2 Gouges.
- * 2 Bradaws.
- * Carpenter's brace.
- * Set of centre bits, * 3 twist bits: three-crow bit countersink for wood, rose bit countersink flat countersink bit for iron, auger bits $\frac{1}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in.
- * Steel rule, 24 in. 24 in.
- * Carpenter's square, 8 in.
- * Spirit level, 10 in.
- * Marking gauge.
- Compass saws (handle and 3 blades)
- Ketchikan saw.
- Coping saw and spare blades.
- Chisel, firmer, * 4 in., 1 in., 1 in.
- * Mallet, joiners.
- * Metal vice 4 in. jaws—Carpenter's bench vice.
- Spoke shave, metal.
- Jack plane, 2 in. iron.
- * Smoothing plane.
- * Nail punch.
- Putty knife.
- Glass cutter (wheel).
- * Glue pot.
- * Oil stone in case.
- * Pliers, Lincolshire, 8 in.
- Wing compasses, 8 in.
- Band saw, American pattern.
- Combination plane, 8 in.
- Crate punch.
- Hand drill and set of twist drills ($\frac{1}{8}$ in. to $\frac{1}{2}$ in. using by 1 in.) in metal holder.
- Brace * 1 in., 1 in., 1 in.
- Brace holder, adjustable.
- Files: * Saw file, 6 in.; hand file, * 8 in. bastard, 8 in. second cut; * half round 8 in. second cut.
- Cold chisels: flat chipping * 8 in. by $\frac{1}{4}$ in.; 16 in. by $\frac{1}{4}$ in.
- Mason's hammer, 2 lb.
- Soldering bit, adjustable, 12 oz.
- Tinman's snips, straight, 8 in.
- Hack saw and assorted blades.
- * Adjustable spanner wrench, 10 in.
- Adjustable pipe wrench.
- Set of hex spanners.

Tools should be kept in a simple rack or in shelves adapted to each type or group of tools. Orderliness preserves the tools and saves time.

In the article on Amateur Carpentry will be found helpful information about the lay-out of a workshop and the arrangement of a bench. Should the home worker decide to make his own bench he will find the necessary plans and details in the article Bench. As a makeshift a stout false top can be used on the kitchen table if the latter is of substantial construction. The top should be of 1 in. T. & G. flooring or similar stuff, and can be cramped to the table top when in use by a pair of 6 in. G. cramps. A piece of board can be interposed between the screw of the clamp and the underside of table to prevent marking the latter, and a recess might be formed in the upper side of the false top to take the jaw of the clamp.

With the kit of tools enumerated above the handyman will be equipped to tackle all sorts of repairing jobs about the home, and to do simple constructional work. Since timber can readily be obtained in a prepared state, the amateur will not be called upon to do much planing. If he further arranges for his

boards to be ripped to width at the timber yard (in cases where a stock width board will not work in) there need be little sawing but that involved in cross cutting to the desired dimensions.

Moulded sections in a wide and useful variety can be obtained, and turned sets of legs suitable for tables, cabinets, or stools. The stile and rail for a paneled door, e.g. for a cupboard, can be made from ready grooved material, the groove being of a size to take stock plywood. The legs for a cabinet can be purchased with grooves formed in them, saving much labour to the novice. These refinements permit of quicker and easier construction, and avoid the purchase or use of tools like the moulding planes, plough, filister, etc. Joints can be simplified by the use of dowels to a considerable extent.

The woodworker as his skill increases may desire to undertake cabinet making and perhaps inlaying, marquetry and similar ornamental work. The tools for these are detailed in the specific articles on the subjects mentioned. Woodcarving also demands tools of a special nature.

Apart from these special requirements the worker can well supplement his tool kit with the following:

- Rip saw, 25 in., 4 points to inch.
- Band saw, 20 in., 7 points to inch.
- Bow saw.
- Try Square, 24 in.
- Rebate plane.
- Side filister.
- Plough.
- Mortise chisels, $\frac{1}{2}$ in., $\frac{3}{4}$ in.
- Mortise gauge.
- Finer gouges, $\frac{1}{4}$ in., $\frac{1}{2}$ in., 1 in.
- Saw set and assorted saw files.
- Sash cramps (2).
- Plumb rule.
- Plumb bob and line.
- Box square.
- Half round rasp, 8 in.
- Mitre box.

In place of the separate rebate, filister and plough planes mentioned above, the worker could buy a combination tool with an assortment of cutters.

Tools for Outdoor Work

For outdoor work the following will be handy: farmer's saw, for cross cutting rough wood; Kent axe, draw knife, beetle or maul, for driving posts, splitting timber, etc.; one or two augers and handle; brick trowel, 10 in.; pointing trowel, 5 in.; sledge hammer, 3 lb. If a permanent workshop is available it will pay to invest in a leg vice, which stands on the floor and is screwed to the bench. A small anvil will be invaluable for riveting operations, and can be had to rest on bench, or with a spike to knock into a wooden block. The latter is useful in dealing with a job which cannot be taken to the bench. The amateur who wants to do a little forging should refer to the article on that subject, where the necessary implements are detailed. A grindstone or some type of bench grinding machine will be needed to keep the cutting tools in proper order.

The tools used in wood turning are dealt with in the article on that subject, while the amateur metal worker will find appropriate tools listed under such headings as Lathe, Metal Turning and Metal Work. The cutting of screw threads by hand and machine demands special tools, about which the relevant information is given in the articles Screw Cutting, Stocks and Dies. If any considerable amount of metal work is done it is well to include in the tool kit a small steel set square, spirit level, scribing block, surface plate and

sliding caliper gauge. A steel rule about 12 in. long is convenient for this work.

Care of Tools. Ordinary wooden trying, jack, and smoothing planes are made of beech. In making a choice, the direction of the grain should be carefully noted; it should run straight along the side, and the annual rings should be of large radius curving towards the sole, with the medullary rays vertical. The irons should be double, and with parallel sides, with the back iron well arched, and should fit snugly in the mouth. The mouth of a new plane should be stopped with putty and the opening filled with linseed oil and left until fine globules of oil appear on the ends, the surface being wiped over from time to time. Iron planes of the above type should have double irons, those fitted with single irons being of little use for serious work.

Much trouble can be avoided by the amateur in planing if the right sort of plane is used for the work in hand. The smoothing plane, for instance, should on no account be used except for taking the finishing shavings off a previously planed surface. This plane is short and light, the mouth is small; and the irons should be set close together, it is not intended to true a surface in the sense of making it level, but to render the true surface perfectly smooth.

For most general purposes a correctly adjusted jack plane, either wood or metal, is capable of doing all the work the amateur is likely to tackle, but, even considered as a general-purpose plane, there is a correct way of holding it, and several ways of adjusting it to suit particular uses. The shavings from a correctly set and properly sharpened jack plane should be parallel and have an even curl, and the sound of the cut is easily recognizable by the experienced woodworker. The necessity of a sharp cutting edge is specially important in the small planes, such as the rebate, plough, beading, moulding, and similar tools, and it is not a simple matter to sharpen the small curves while retaining the correct shape.

Choice and Care of Saws

Saws of all kinds should be of the best quality obtainable. The skew-back hand or rip saw with the blade extending well into the handle is generally preferred, as it is more under control and is not liable to work loose in the handle. The brass or iron back on a tenon saw should be heavy and made of stout material, and it should be noted that its own weight ought to be sufficient to carry it through the wood. A good handsaw can be tested by the sound when struck sharply with the finger nail, and it should be possible to bend the blade to a semi-circle without affecting its straightness.

When not in use, tools should be kept in a drawer, cupboard, or chest, and arranged with a special place for each. When they are on the bench, one should be careful that the cutting-edges do not come into contact with other tools or with the bench. The planes should be rested on a thin bath placed across the bench. The wedges should be carefully driven in with a mallet, but the same tool should not be used to adjust the iron. The mallet is the best tool to use when loosening the irons. The sole of the plane should be frequently wiped over with linseed oil, and to protect the surface unplanned wood should be brushed over before planing to remove grit, etc. The cutting irons of rebate, beading, moulding, and similar narrow planes are liable to damage if allowed to lie on the bench, and these tools should be put away directly after use.

Saws should be hung up when not in use, unless there is a special place for them; they should be frequently wiped with vaseline, tallow, or lubricating oil. If they are not

kept in a chest or cupboard properly supported, it is a good plan to cover the cutting edges with a strip of wood in which a groove has been sawn. Chisels should be placed down on the bench after use with the bevel side downward, as there is less risk in this way of causing damage to the edge but the better plan is to have a rack on the bench, conveniently placed at the back so that tools being used on a piece of construction can be placed out of the way of damage. The handles of chisels used for mortising soon become bruised on the ends, and unless the small chips are trimmed off they will act as wedges and split the whole handle. It is useful to keep a coarse-cut file handy for trimming the end of the wood.

On no account should wood-boring bits of any kind be allowed to lie on the bench after use; they should be placed in a rack or drawer. The try square is another tool requiring careful usage, as it soon gets out of truth if allowed to fall on the floor or be knocked about. Quite as much care is needed with metal-

working tools, although they are as a rule heavier and less liable to damage. Tool racks should be provided for the metal-working bench, not only to prevent damage to tools, but in order to be able to find them when required. Metal clips are obtainable for attaching to the wall, but wooden racks or other suitable means of support are easily made. The amateur craftsman should make a point of providing a place for each tool and see that it is in its place when not in use.

Tools such as a hand drill need a special place in the tool box or cupboard, and should not be buried among all sorts of heavy implements. Smaller tools, well smeared with grease, can be kept in a long narrow tin biscuit box. Drills, reamers, broaches, taps, etc., are best kept separate in flat cigarette tins, each sort in a special box. Only one layer should be accommodated in the tin, or the cutting edges will suffer damage by contact with tools above. The tools if greased will be free from rust, and the arrangement mentioned will enable any one of them to be found without difficulty.

TOOL CUPBOARD: HOW TO CONSTRUCT

With Working Diagrams for a Simple Type

This article on a receptacle for tools used by the amateur carpenter or mechanic is complementary to the preceding one dealing with the selection and care of tools themselves. Reference should also be made to the entries on the various tools and processes.

A cupboard devoted solely to tools is an ideal arrangement in any household. The cupboard fulfils its purposes if it has also to be a depository for odds and ends unconnected with those tools. Ease and speed of access are two main considerations, therefore the cupboard should not be too deep. And it should be in full light, where the contents are all visible at a glance. An existing cupboard which falls short only in the latter respect can be adapted by the fixing of an electric bulb in such a manner that the entire contents of the cupboard are shown up as the light is switched on. A further consideration is privacy; a busy kitchen or scullery is no place for the tool-seeking amateur carpenter

with the smoothing plane underneath at F; a bow saw can be hung at the back on hooks at G, and on the other side can be hung a brace at H.

A mallet, oilstone, and rebate plane will rest on the top shelf at J; chisels and gouges can be placed in slots cut in a length of wood at K, at the back of the lower shelf at L. In front of the piece K, a flat length M will hold the bits, and leave room in front for other tools. There are two pigeonholes at N and O for glass paper, etc., leaving the top drawer P for small tools, and the lower ones Q and R, for nails and screws. The advantage of this arrangement is that each tool has its own particular place and is easily picked out.

The whole collection can thus be placed in a convenient position.

The construction of the cupboard is quite simple. The outside boards are 1 in. thick finished, and should be obtained machine-planed to this size, two finished lengths of 36 in. and two of 34 in. should be prepared to a width of 10 in. The back is $\frac{1}{2}$ in. or $\frac{1}{4}$ in.

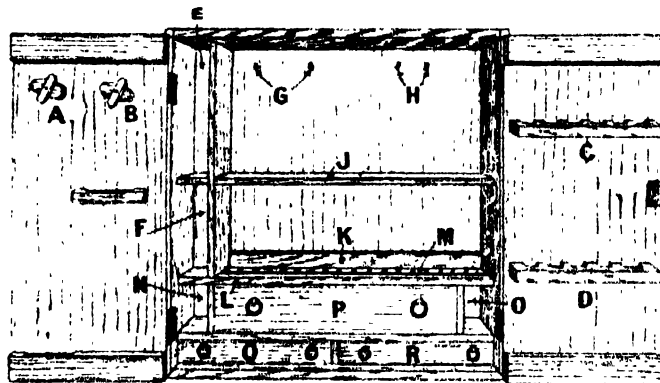


Fig. 1

who has to open a large cupboard door and "get in the way." All things considered, it may be most convenient to arrange a small number of tools in a cupboard such as that illustrated in Fig. 1. The outside dimensions are 36 in. wide and high, 10 ins. deep; the doors fit inside the framing, and are stiffened with battens.

The internal arrangements allow of a 20 in. cross-cut saw on one door, attached to the shaped block at A; alongside is placed a tenon saw at B. The two racks on the other door, C and D, will take such tools as gauge, square, pincers, screwdriver, hammer, gunlets, bradawl, etc., suitable slots being cut to hold them securely. Inside the cupboard a jack plane will fit in the space at E,

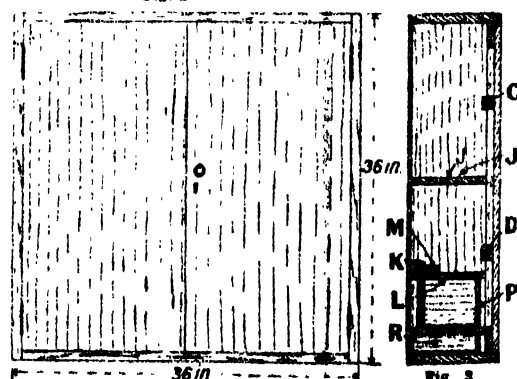
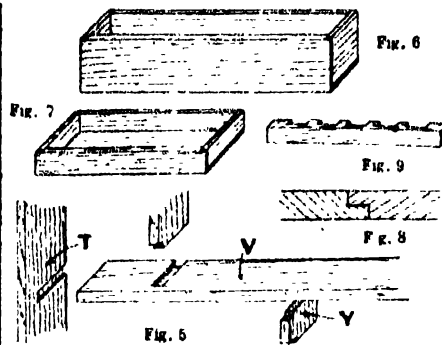
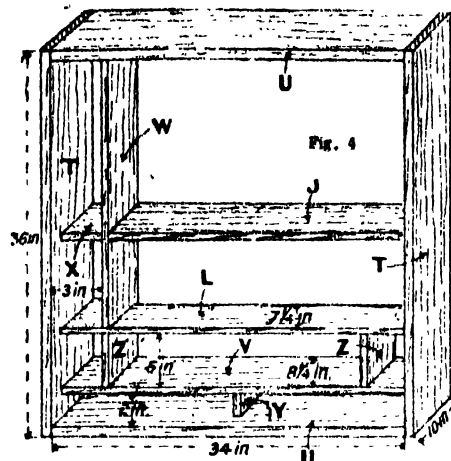


Fig. 2

Fig. 3

Tool Cupboard. Fig. 1. Small cupboard, shown open, for the handyman's tools. Fig. 2. Elevation of cupboard when closed. Fig. 3. Side elevation. For lettering see text.



Tool Cupboard. Fig. 4. Details of partitions in the construction of the cupboard illustrated in the opposite page. Fig. 5. Joint for shelves. Figs. 6 and 7. Drawers. Fig. 8. Section of door edge. Figs. 9 and 10. Blots for tool supports. The lettering is explained in the text.

plywood, and, although it can be nailed or screwed on the back edges, a much neater job is made if it is rebated, as shown in Fig. 3, which also shows the two sets of drawers.

The method of making the carcass is shown in Fig. 4. The sides T are nailed or screwed to the top and bottom pieces U, but the various partition pieces should be housed into the outer frame first, as in Fig. 5. To do this work accurately, the wood must be marked out as far as possible with the parts placed together. The two sides T should be placed side by side, a line being marked 1 in. down from each end to indicate the position of the top and bottom pieces U. A line is marked off 2 in. up from the bottom line, and this should be followed by another 1/4 in. above, in order to give the position of the groove for the lower shelf V. The next shelf is 5 in. above, and two lines are marked off, one 5 in., and the other 1/4 in. above it. These shelves, L and V, measuring 34 1/2 in. by 8 1/4 in. by 1/2 in., are placed together so that the groove for upright W and its continuing piece underneath can be marked out, as well as a corresponding piece to the under piece on the other side between V and L. These pieces are 3 in. from the outside pieces, so that the grooves should be 3 1/4 in. from the ends. The piece W is 26 1/4 in. by 8 1/4 in. by 1/2 in., and the 2 pieces Z under the shelf L are 5 1/2 in. by 8 1/4 in. by 1/2 in. The piece at X is 8 in. above the shelf L, and is cut to 3 1/4 in. by 8 1/4 in. by 1/2 in., the shelf J is 3 1/4 in. by 8 1/4 in. by 1/2 in., and is the same height. The division piece at Y is fitted half way between the sides, and cut to 2 1/4 in. by 8 1/4 in. by 1/2 in. It will be seen from Fig. 5 that the long shelves which fit in the sides T are let in the full width, but the other parts are notched at the ends and fitted in stopped grooves, 1/4 in. deep and 1/2 in. wide. When all the parts shown in Fig. 4 have been prepared, and a 1 in. deep slot cut at the back of the shelf L, the carcass can be glued, nailed, or screwed together. In doing this, care should be taken to see that the corners are quite square.

The back is next cut to fit in the rebate. If, however, this method is not used, the width of the partition pieces should be 8 1/4 in. instead of 8 1/2 in. Small brads or screws will be sufficient to retain the back in position and make a solid case. A 27 in. by 5 in. by 1/2 in. piece should be fitted in the space between L and V and be flush with the back of the narrowed portion of the shelf L, to provide a boxed portion for the chisel blades. The drawer to fit in this space is shown in Fig. 6. It is made with a front 27 in. by 5 in. by 1/2 in., two sides 6 1/2 in. by 1 1/2 in. by 1/2 in., and a back 26 in. by 1 1/2 in. by 1/2 in. The front piece should be rebated 1/4 in. each way at the ends, and 1/2 in. by 1/2 in. underneath to take the bottom, measuring 27 in. by 6 1/2 in. by 1/2 in. Glue, nail, or screw the parts together, and smooth with glass paper to allow it to move freely in the space. Suitable handles are fitted on the front as shown.

The two bottom drawers, Fig. 7, have fronts 16 1/2 in. by 2 in. by 1/2 in., sides 8 in. by 1 1/2 in. by

1/2 in., and ends 15 1/2 in. by 1 1/2 in. by 1/2 in., and a bottom 16 1/2 in. by 8 in. by 1/2 in., the fronts being rebated as for the drawer above. If flush handles are fitted the drawers can be full length from front to back, but if the handles project suitable allowance must be made in the lengths of the sides and the bottom. The inside of the drawers can be divided off to provide compartments for nails and screws, plywood being quite suitable for this purpose.

The doors are each 34 in. long and 7 in. thick, one is 17 1/2 in. wide and the other 17 in. wide. A rebate 1/4 in. each way is cut on the meeting edges of each door, as in the section at Fig. 8, and then a batten of 2 in. by 1/2 in. wood is placed along the bottom of each door and glued and screwed on.

The fittings to hold the saws and other tools should be attached before the doors are hung, the hinges can be fitted at this stage but not screwed up. The saws are fitted with a shaped block to fill in the handle space, a turn-button made to the length, and then the pieces can be screwed on at the top. The tip of the saw should be arranged to fit just in the top of the bottom batten, but it will be necessary to make a slotted piece to take the end of the tenon saw. The slotted piece in Fig. 9 indicates the method of making the supports for the tools on the other door. Each tool should be separately fitted, and the correct sized hole cut.

The various hooks are now placed in the back to hold the bow saw and braces. A long strip of 1 1/2 in. sq. wood is fitted to the back of



Tool Cupboard. A well-stocked tool cupboard for the home worker in wood and metal. Courtesy of R. Melhuish, Ltd.

the top shell L, and slots as at Fig. 9 cut in to take the chisels and gouges. These should be played side by side as closely as possible, 1 in. in between the handles will be ample space. The slots are marked off on the strip and cut out. When fitted in position, the blades will fit in the space between the top drawer and the back of the cupboard. A 1 in. by 1/2 in. or 1 in. strip will be large enough to hold the bits shanks downwards. The best method of making the holes for them is to drill a slightly smaller hole and then cut square with a narrow chisel as in Fig. 10.

Cupboard bolts are fitted, together with a lock and then the outside can be either painted or sized stained, and varnished. As the cupboard will be fairly heavy when completely filled with tools, special precautions should be taken to secure it to the wall. One method is to screw on strong brass mirror plates on the top and on the sides near the bottom, and screw to a wooden wall or to fibre plugs in a brick or plaster wall. As an alternative, two mirror plates can be fitted at the top and the bottom supported with iron brackets.

Tooth. See Teeth.

TOOTHACHE. There are two different diseased states of a tooth which may give rise to toothache. One results from inflammation in the soft centre or pulp of the tooth.

The pain in this form of toothache is sharp or shooting. It varies in intensity at different times, usually it is increased on lying down. But the tooth itself is not painful on being tapped. The taking of a meal tends to increase the pain, more especially if food is pressed into the cavity or hot liquid reach the exposed nerve.

In the treatment of this form of toothache it is most important to find the cavity in the tooth and, if possible, to clear away any food which may be causing pressure on the nerve. The next step is to fill the cavity with a small, loosely rolled pledget or wad of cotton wool dipped in oil of cloves or strong carbolic acid. The excess of these drugs should be gently pressed out of the cotton before insertion. The gum in the neighbourhood of the painful tooth may also be painted with tincture of iodine. After drying the gum with cotton, this should be applied with a small brush, and the mouth held open for 2 or 3 min., so as to ensure that the iodine may not be washed quickly away. A dentist should be consulted at the earliest opportunity.

The other diseased condition of the tooth which may give rise to toothache requires different treatment. In this variety the pain is dull, continuous, and boring. The tooth is painful on pressure or tapping. The tooth frequently appears elongated or raised in its socket, and when the teeth are closed it is often acutely painful. The inflammation in this case is really outside the tooth, round its root. From the inflamed stage it may pass on to suppuration, and the pain is then likely to be more or less continuous for two or three days, until the pent-up matter is able to force a passage through the bone, when a gumboil appears over the root of the offending tooth. The gumboil is itself painful to pressure, but the boring pain usually passes away almost suddenly with the appearance of the swelling.

Some relief may be got by painting the gum in the manner already described with a mixture of equal parts of tincture of iodine and tincture of acetate. Water, about as hot as it can be borne in the mouth, may also be tried. A saline purge is often useful in the early stages of the disease, and 5 to 10 gr. of aspirin will frequently give relief in this form of toothache. All these remedies are, however, quite unsatisfactory except for

temporary relief, as the cause of the trouble remains. For this reason it is most important that the sufferer should have the offending root or tooth properly treated or extracted by a dentist. See Canines, Teeth.

TOOTH BRUSH. Handles that are fashioned from bone are much the best for tooth brushes, as they do not easily chip or warp, and cut lengths of white French or unbleached yellow bristle are chiefly used for the best tooth and palate brushes. The latter are made with larger handles and more rows of knots, for cleaning dental plates, etc.

Nylon and other synthetic bristles are now extensively used in tooth brushes, as are plastic handles. All quality bristle brushes are made either by trepanning or are wire drawn, the former being recognizable by the plugged holes in the end of the brush, and the wire drawn by the lined back. Synthetic bristles are invariably trepanned into the handle. The tops of the bristle or nylon are cut straight, concave, or serrated, the last style being preferred by many.

It is essential that a tooth brush should be kept clean and dried after use. Washing the brush occasionally in warm water should not be neglected, and this will remove any accumulation round the roots of the knots. A holder or rack should be found for tooth brushes where they can hang, or they should be stood up to drain and dry. On no account should they be left lying about, as they are liable to pick up undesirable matter. The importance of the operation a tooth brush is intended to perform warrants a more careful selection than is generally made. Cheapness is not only very poor economy, but in use a poor tooth brush is decidedly unpleasant. Bristles break off or come out in the month, and most of those remaining are entangled and cramped, with a few in a likely position to puncture the gums when the brush is again used after being dried. A brush in this condition should always be discarded and a new one obtained. See Dentifrice, Mouth-wash, Teeth.

Tooth Paste. See Dentifrice, Teeth.

Tooth Powder. See Dentifrice, Teeth.

TOOTHPICK. Toothpicks may be either of quill or of wood, being short pieces sharpened at one end. The latter are easily made with a penknife. The use of a toothpick, however, is not, in the opinion of the best authorities, advisable, as it is liable to injure the enamel. If there exists a cavity in the tooth in which food lodges, it is well to consult a dentist.

TOPAZ. A semi-precious stone, the topaz is surpassed in hardness by very few other gems. It is found in several parts of Great Britain. Its value depends upon its depth of colouring, the sherry-coloured stones being considered the best. The white topaz is not unlike the diamond in appearance, but diamonds can always be distinguished by their excessive hardness, apart from their lustre. Pink topazes enjoy a certain measure of popularity, but their colour is artificial, being produced by heating the sherry-coloured stones. There are also blue, green, orange, and pale and golden-yellow topazes.

TOP DRESSING : Of Plants. Rich soil or manure that is spread over the soil to assist the development of trees or plants is called a top dressing. It may be put on for the purpose of keeping the soil moist in hot, dry weather, or to increase the size of fruits or flowers. When such plants as chrysanthemums, lilies, or tomatoes are grown in pots it is usual to leave space at the top for a top dressing of rich soil when newer buds or fruits are developing. Sand is an excellent autumn top dressing for a lawn on heavy land; sifted

leaf-mould and decayed manure benefit a lawn on sandy soil.

TOPIARY. The art of clipping and training trees into various artificial and formal shapes is known as topiary. The view is the



Topiary. Clipped yew and holly trees which are attractive in a formal garden.

principal subject, but other trees and shrubs are frequently treated in this way, including box and holly. Many firms make a specialty of growing trees in tubs suitable for topiary work. Topiary trees should be clipped in May and again in August. See Box, Hedge, Yew.

TOPSIDE : Of Beef. The top or outer portion of the round of beef is known as the topside, the inner half being the silver-side. It is a most economical joint for a family, especially where a large number are to be catered for, but, although well flavoured and full of gravy when served hot, it is apt to eat dry when cold. It makes excellent pie meat, being full of gravy and free from bone or gristle. It is also good for stews, or à la mode beef, which requires lean meat.

Topside is often salted and boiled, but silver-side is preferable for this purpose. The topside, however, is excellent if spiced for Christmas beef. A good-sized piece will take from a fortnight to 3 weeks to pickle. It cuts better if it is larded with strips of fat bacon inserted in it at intervals. Portions of topside of beef may also be potted; the meat should be freshly cooked, flavoured with vegetables and spice. It is better to stew it in the oven, adding as little water as possible. When cooked, the vegetables should be removed and the meat minced, then pounded and potted in the usual way with butter, spice, a little of the gravy it was cooked in being strained and added. See Beef; Carving; Stew, etc.

Torch Lily. This is an alternative name for the red hot poker (q.v.).

TORENIA. This is a greenhouse annual flowering plant, with violet-blue or yellow flowers. It should be grown in pots, or baskets suspended from the roof, containing a mixture of loam, leaf-mould, and sand. The seeds should be sown in February in a temperature of 60 degrees. When large enough, the seedlings may be transferred to 5-in. pots, and the side shoots pinched off as they develop, in order to induce the plant to make bushy growth. The best species are T. Fournieri, violet-blue, and T. Baillonii, yellow.

TORTOISE : In the Garden. A reptile with four feet and encased in a strong shell protection, the tortoise is cold-blooded and

hives to a great age. The two kinds usually kept in Great Britain are the land tortoise and the marsh tortoise or terrapin. The former is mainly herbivorous and can be fed on lettuce, cabbage, grass, dandelion and buttercup flowers, also soft fruits. The marsh tortoise is mainly carnivorous.

If the land tortoise is to be kept in the garden it must be restricted in some way, or it will cause damage to vegetation. If possible, it should be assigned to a sunny position near a wall bounded with wooden boards, with a portion of the space covered with felt or Willesden canvas to provide protection from the sun and rain. Tortoises will bury themselves in the ground during the winter. They may be placed in a box containing soil or leaves, and left in a cool room until spring; when they awake they can be fed on lettuce or cabbage leaves, although they will eat very little at first.

TORTOISESHELL. Horny material obtained from the carapace plates (upper shell) of the hawksbill turtle native to West Indian waters. The plates, 13 in number, overlap and vary in length from 12 to 18 in., width about 6 in. The shells become semi-transparent when polished, but they vary in value: the finest shells are marked with reddish brown and golden yellow shades. Many consider the blonde shells to be the most beautiful, but for brush making the darker, less transparent kinds are more popular.

Tortoiseshell is used to make all manner of toilet accessories. Manicure sets, powder boxes, hair brushes and combs, and complete dressing-table sets can be bought in both genuine and imitation tortoiseshell; the latter is a mottled plastic material. Other articles made from tortoiseshell include spectacle rims, cigarette, card, and match cases, purses, lorgnettes, mirror backs, and vanity cases. This shell is also used for inlaying clock cases, cabinets and other articles of furniture with delicate metal or brass tracery after the style of Buhl.

TOUCH: The Game. Perhaps the simplest form of this popular outdoor children's game consists in one player running after the others with the object of touching one of them. When he does this he must call out touch, and the one touched takes his place and becomes the chaser. A variant is known as touch wood. In this the players can secure a respite from being chased by touching anything of wood. As long as they do this they cannot be touched. A further variant requires the player who seeks a respite to whistle in addition to touching a piece of wood. As soon as he ceases to whistle he can be touched.

TOURMALINE.

The mineral that is known as tourmaline is found in a wide range of colours, but it does not rank among the most expensive gems. Its tints include various shades of red, green, grey, blue, and yellow, the green tourmaline bearing some resemblance to the more valuable aquamarine.

Red tourmalines sometimes possess deep tints and are known as rubellites.

The blue tourmaline, which is less valuable than the green, is also called the Brazilian sapphirine.

TOURNIQUET. This term describes an instrument by which a pad can be applied tightly to a blood vessel to stop bleeding or to keep the limb bloodless during an operation. The pressure from a tourniquet must be applied above the wound, i.e. between the wound and the heart.

An emergency tourniquet may be made with a folded handkerchief, a scarf, towel, stocking, or piece of calico. A stone or other hard object is fixed so that it will compress the artery. The band is tied round the limb, and then tightened sufficiently by running a stick under the bandage and twisting it. A tourniquet is for temporary use only, and it should be removed as soon as possible. Should it be left in position too long, gangrene of the limb may set in. *See* Bandage. Bleeding.

TOW. Whenever flax is being prepared, a certain proportion of short fibre or tow is combed out of the linen. This tow is manufactured into crash, canvas, cheap towels and so on. Little woody particles can usually be seen adhering to the cloth in fabrics that are made from tow. Ropes are made from strong, coarse tow.

In surgery, hemp tow is an excellent substance for padding splints, and for applying to pruned parts when elastic pressure is desired. It is also a good material on which to spread a linseed poultice, preserving the heat for a longer time than a piece of linen cloth. Carbolic tow makes a very efficient dressing for wounds.

TOWEL. Towels are generally classified as roller, bath, hand, and guest towels. Roller towels may be of strong unbleached linen, coarse huckaback or brown Turkish towelling. The first of these materials is most suitable and gives the longest wear. These towels are



Tourniquet. Improved tourniquet applied to right brachial artery. Lower bandage is applied to hold the stick used for twisting.

easily made at home as they are simply formed by a straight strip of towelling 3 yd. long, or the most convenient length for the particular door on to which the roller is fitted. The strip is neatly sewed in order that it may revolve when required.

Bath towels are made of Turkish towelling in different qualities and sizes. The largest are known as bath sheets and are usually stocked in two sizes, 48 in. by 72 in. and 48 in. by 80 in. Other white Turkish towels vary in sizes from about 20 in. by 40 in. to 30 in. by 60 in. These towels are sold hemmed ready for use. Terry towelling which is obtainable in colours and also in patterned designs is used to make coloured bath towels. Coarser bath towels are light brown in colour, but are strong and hard-wearing.

Hand towels vary greatly in quality and price, and are made in 3 usual sizes.

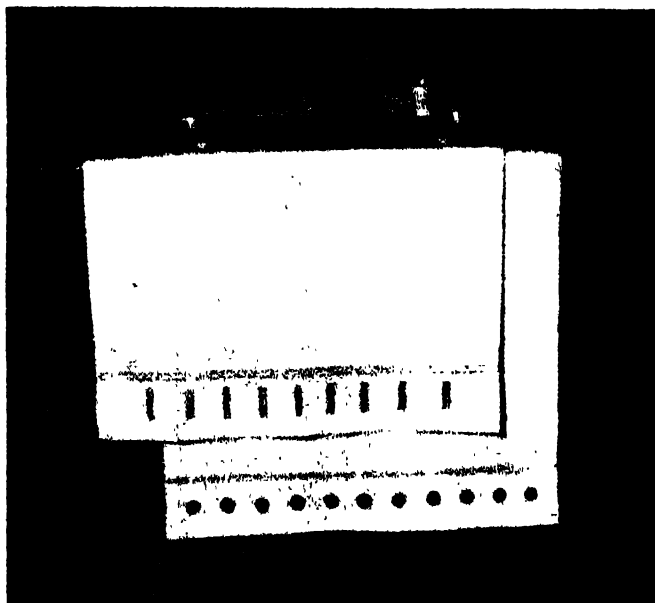
18 in. by 32 in., 20 in. by 36 in., and 22 in. by 40 in. Huckaback towels in fine weaves with damask borders finished by hem-stitching are always pleasing. For family use a somewhat stronger weave is recommended and plain hemming may be considered more satisfactory than hem-stitching. Huckaback towels may also be purchased with coloured borders, and coloured damask guest towels are obtainable. The usual size for these is 15 in. by 22 in.

Ornamental Towels. Bath, hand and guest towels may be improved by worked monograms or borders in coloured cross-stitch. A pretty design of a type suitable for the latter purpose is shown in page 420. Guest towels can be made of fine white huckaback, measuring 15 in. by 22 in. after being hem-stitched. Embroidery is usually placed only at one end, but both ends are hem-stitched. Very dainty trimming is supplied by a small design in Renaissance or Khetha work, both of which are illustrated in page 420. The embroidery can be worked in colour or in white on a coloured towel. Crochet lace is also a suitable edging and trimming.

Many women buy plain towels of a good quality and decorate them with a little stitchery. The towels here illustrated are embroidered in coloured stranded cottons. The top one has 3 lines and the row of short vertical stripes worked in chain-stitch in 3 shades of blue. The lower one has 3 lines of stem-stitch and a row of circles worked in plain and raised satin-stitch, using several shades of mauve. Other borders may be carried out with sprigs of flowers in lazy-daisy stitch.

Roller towels and the coarser bath towels can be marked with marking ink, but bath towels of good quality are improved by initials boldly designed or embroidered monograms.

Towel Rails and Airlers. Where one bath room is used by several persons it is an advantage to have individual towel rails. These can consist of metal rods enamelled white and fixed to the walls with chromum-plated screws and brackets. Swing towel rails consisting of 2 or 3 wooden or metal arms mounted on a plate fixed to the wall save space in small bathrooms. Towel rails should not be fixed in airing cupboards as the drying towels make damp any clothes airing therein. A towel ailer is another convenience in the bathroom. It is often in the form of a plated, tubular stand heated either by an electric element or by steam from the domestic hot-water system.



Towel. Bath towels ornamented with stitchery in colours. The upper has lines and stripes carried out in shades of blue and the lower has circles in mauve.

TOYS AND TOY MAKING

Suggestions that will interest both Parent and Child

The important part played by toys in child life is recognized in this article, which adds to the information given under the headings of individual toy, such as Aeroplane; Doll; Kite; Kilted and Stuffed Toys; Jigsaw Puzzle; Noah's Ark, and various model engineering contributions such as Boat; Engine; Locomotive; Railways. See also Casting; Child; Christmas; Nursery

Children find expression in toys from earliest infancy. A rattle or a coral with tinkling bells inspires them with the desire to repeat the pleasant sound. A brilliantly coloured ball excites their admiration. They pass through a stage of surprise at a jack-in-the-box or clockwork animal to curiosity which, though perhaps indulged in at the expense of the particular toy is the beginning of knowledge and invention. Imagination is stimulated by the games of make-believe, from a Noah's ark or doll's house to the wonder of things made by hand out of toy looms, from carpentering sets and plasticine to a meccano set.

The playing of games of skill with hard and fast rules develops a child's character by the discipline of competition within limits, but into his play with toys he weaves the fancies which are the outcome of his individuality.

For this reason it is a mistake to interfere too much with his choice among his toys. Having had the winding-up of a new tumbling clown explained to him, he may be delighted with its novelty for a while, but when that has worn off he has no further use for it, and turns to play for hours with a grocer's shop, weighing out commodities from bottles and tins on miniature scales, or doing up tiny parcels and falling in gladly with a suggestion that his horse and cart should be a delivery van. The great thing is that he should learn concentration by being absorbed in whatever he is doing at the time. Boredom lies in going from one toy to another in a desultory fashion.

Toys should be put away when playtime is over, and a child should have a special shelf if a cupboard or locker of his own is not possible. If it can be avoided, it is a mistake ruthlessly to sweep away his unfinished creation of bricks or the setting of a farmyard drama, but a warning can be given that time is nearly up, and sometimes a little assistance will help towards the satisfactory completion of an episode or episode. The care and repair of toys should be taught to children from an early age.

Nearly everyone who has had to do with young children has had the experience of seeing an expensive toy fail to please or be cast aside in favour of a cheap one. Value is represented to their minds not by its

cost but by the amount of interest and amusement that they can get out of the toy.

The younger the child the more eager he is for a toy which is symbolical rather than realistic. The round block of wood spotted red and blue, with roughly carved neck and head edged with fur, and set on four legs and a green wheeled stand, is more dearly loved than the finest model of a pony with real skin and hair. They outgrow this stage when a Noah's ark becomes silly because the elephant is out of all proportion to the rabbit; or the nursery floor as an ocean for the ship on wheels fails to satisfy the little boy who has seen a friend launch his boat on real water.

Some children delight in miniature things. They like to collect families of tiny dolls, furniture, and animals. A few low shelves where they can set out these things and leave them undisturbed till the next playtime is a happy arrangement, especially if provided with a curtain on rod and rings. Other children like to impersonate the characters in their games. A toy outfit of a bus conductor may give more pleasure than a mechanical model of a motor bus, even though a sofa with a few dolls on it represents the vehicle to be driven.

Outdoor toys are nearly always fascinating. Hoops, skipping ropes, scooters, battledore and shuttlecock, sailing boats, balls, and dolls' perambulators all have their attractions, but probably none give more joy than the wooden spade, the shrimping net, and the tin pull at the seaside. The garden becomes an absorbing toy. Such gifts as a practical toy gardening set, consisting of a number of tools and a wheel barrow, and a small piece of the garden, usually have a great appeal.

When choosing a toy as a present, especially for a small child, occasionally people make the mistake of giving something which amuses them, such as a mascot or novelty of the moment, which has no meaning to the little recipient, instead of some simple toy which would really please. Should the present be intended to impress the parents of the child

rather than the child himself, it is better to let it take some other form.

Mechanical Toys. - Constructional toys in the form of collections of parts afford much entertainment to children of the age to understand them. It is a waste of money to give such sets to a younger child who will be better pleased with a robust clockwork toy. The constructional set depends for much of its entertainment and educational value upon the appeal it makes to the imagination and ingenuity of the owner who can combine and recombine the parts in a variety of ways. The parent can initiate the work, and assist, but the youngster should be left to solve his own problems as far as possible. Steam engines and clockwork or electric motors can be purchased to supply power to the working models thus built up.

Model railways are dealt with in a separate article, but a word or two here about toy train sets may be appropriate. The common tinplate track as supplied with train sets is usually neither strong nor durable, and it is well worth while to purchase a good set of rails from one of the reliable firms which specialize in these goods.

A word of advice may be given here about electric sets. An accumulator is the best means of supplying the current to the conductor rails. It can be placed on a shelf out of harm's way, the leads being taken down to floor level and ending in a plug fastened to the skirting. The leads should be secured to the wall in some way, and also to the shelf, so that the battery cannot be dislodged by a pull on the wires. Another method is to make a simple wooden box to hold the accumulator, the lid being secured by a small lock, and the box being screwed to the floor in a corner of the room. In this case also the leads can be taken to a plug on floor or skirting. Train sets can be obtained for connecting to the electric light mains, but these are not suitable for children without supervision.

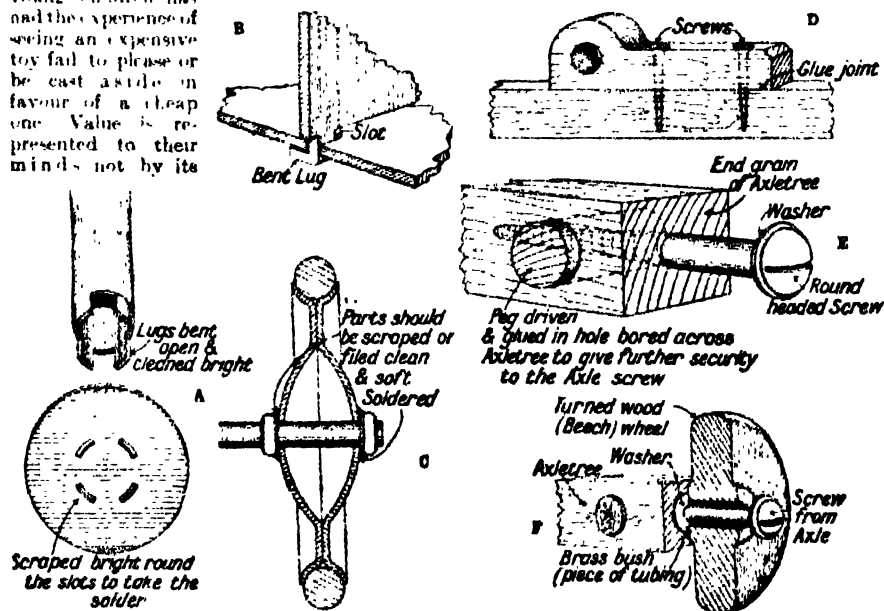
There is a third method of running an electric train, in which a small battery carried in the engine or tender supplies the current. The battery has to be replaced by a new one at frequent intervals, of course, but this is a simple method, and no conductor rails are needed on the track. The above remarks apply to the smaller or toy train sets.

Mending Toys. The cheaper clockwork toys do not usually admit of repair, and even in the case of the better made ones the gears and spring wear out or lose resilience, as the case may be, after a period of strenuous service.

In repairing mechanical toys made of metal, a certain amount of skill with the soldering iron will reduce labour considerably. Where toys are finished by a lithographic printing process, it is absolutely necessary to remove the coating of paint entirely, and to get down to the bare metal by scraping, before attempting to apply the solder. Many cheap toys are made with cog wheels fitted to their shafts or axles with lugs or slots, or by flattening the spindle each side of the fly-wheel boss. Such devices usually give trouble, and even a new toy will be considerably improved in strength and its life prolonged by soldering such joints together. If the paint has to be scraped off to do the soldering, the part can be touched up afterwards with a little oil colour. Points in body construction can also be dealt with in a similar manner, the soldering of the lugs being effected from the inside wherever possible.

Glue is the proper adhesive for wooden toys, but in addition it is often advisable to drill a hole and insert a wood screw across the joint of a fractured part. In fitting screws the preliminary drilling for the screw should not be forgotten, as toys are generally made of the cheapest kind of wood.

The toy maker frequently drives a big nail or screw into the end of a wooden rail and



Toy. Fig. 1. Diagram illustrating methods of repair. A. Detail of lug and slot for wheels of mechanical toys. B. How to solder lugs in body construction. C. Securing a metal wheel to spindle by soldering. D. Insertion of wood screws to mend a fractured wooden joint. E. Another repair for a wooden toy. F. Brass bush fitted to a wooden wheel.



Toy. Fig. 2. Fluffy rabbit which is very realistic when made in white fur cloth

makes the nail the axle of a wheel supporting the whole weight of the toy. Such fixings in end grains are never satisfactory. A cure may be effected by crossing the screw with a wooden plug, as illustrated, or by fitting an all metal axle such as is used in a perambulator. Wooden wheels should be bushed with short pieces of brass tube. The methods of repair mentioned are illustrated in the accompanying diagram (Fig. 1).

Soft Toys. Instructions are given in the article on Dolls for making a rag doll, and other soft toys are dealt with in the article on Knitted Toys. Patch or fur cloth covered toys are easily made by the home worker.

An odd length of white fur cloth can be utilized for the rabbit shown in Fig. 2. The main part of the body and the head are cut in one, but the underpart and the ears are added separately. A quarter of a yard of cloth, 48 in. wide, is needed, together with a little pink flannelette for lining the ears.

When cutting out, use the cloth folded with the selvages together, and arrange the patterns, cut to the shape shown in Fig. 3, in the positions there seen. First join the long, straight seam of the base or underpart, then take it, still folded, so that the seam runs along the top, but with the wrong side inside, and slip it between the two layers of the main body. The latter should be so put together that the right sides face.

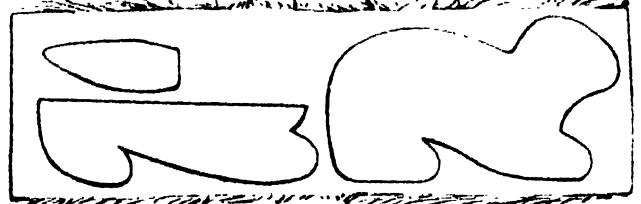
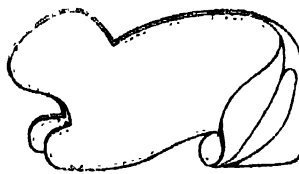
Stitch the edges of each layer of the base to the edges of each layer of the main part, matching the sets of two notches, and also drawing the curved back part of the base down to the lower edge of the main part. Next stitch the two main parts of the body together above the inserted base portions, commencing at the front just below the head, and working around this and along the top of the body to the back of the inserted base.

Leave a small opening in one part of this seam, however, so that the stuffing may be

put in. Turn the shape inside out stuff it tightly with kapok and then sew up the opening. Line each ear with the flannelette; then make a pleat in the straight edge and sew it to the head. The addition of two boot buttons for the eyes gives the finishing touch.

Patterns for other toys of this description can be obtained from "Best Way Patterns," The Fleetway House, London, E.C.4. A delightful example, called Tinker Boy, is illustrated in Fig. 4. This curious creature requires 1 yd. woollen plush, 2 glass eyes, bell and ribbon for the neck, a little black darning wool, and kapok for stuffing. The latest "Best Way" book on Home-made Toys should be obtained at a newsagent's, as new patterns are frequently invented and described.

Wooden Toys. Toys can be made by the home craftsman from wood with a few simple tools.



Toy. Fig. 3. Diagrams for making the fluffy rabbit, showing the shapes for ear, base and body, and (above) how to join up the cover before stuffing

of the body hinged together. It is advisable to use a close-grained wood or 3 ply, the thickness of each piece being $\frac{1}{8}$ in. The various parts are shown in Fig. 7, and are cut out with a fretsaw, the two pieces for the body should be pasted together temporarily with a piece of paper between and sawn to shape as this ensures their being alike. All edges and surfaces should be glass-papered.

The small pieces are glued to one of the body pieces in the positions indicated by the dotted lines. Small nails are driven into the ends of the head and tail pieces, which should be further rubbed with glass paper to make them a little thinner than the small pieces attached to one of the body pieces. Holes are bored or drilled through the body and the head and tail for the hinge screws, and slightly enlarged in the two latter pieces to allow free movement. The balance weight can be of the same shape as that used for the horse, but it should have a groove or a hole through it to enable the string to be fastened. A round ball can be cast in the same way, and looks neater than the flat weight.

Each length of string should be about 8 in., but the

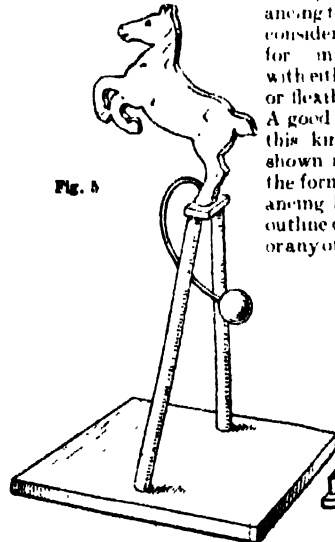


Fig. 5

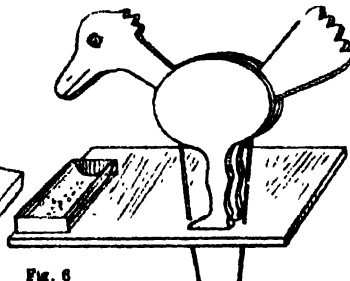


Fig. 6

is marked out on a piece of thin wood about $\frac{1}{2}$ in. thick and cut out with a fretsaw. Any close-grained hardwood is suitable for the work, but with plywood there is little risk of breakage. The pendulum or balance should be of lead, which is cast in a plaster of Paris mould or in a well greased tin lid. The wire is placed in the mould before the lead is poured in, and the other end of the wire is pressed into a prepared hole in the body or other suitable position on the animal. The stand is made from short lengths of dowel fitted in a wooden base; the uprights can be square in section provided sufficient space is allowed for the balance wire to move freely. It is not essential that the

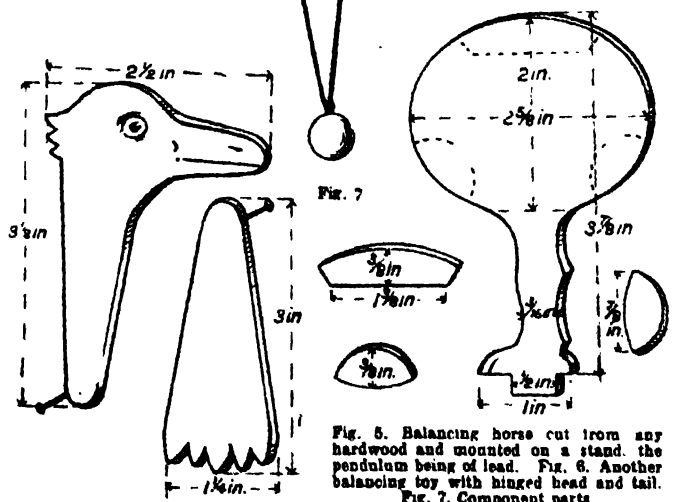


Fig. 7

Fig. 5. Balancing horse cut from any hardwood and mounted on a stand, the pendulum being of lead. Fig. 6. Another balancing toy with hinged head and tail. Fig. 7. Component parts



Fig. 4. Tinker Boy, a strange but appealing animal covered in woollen plush and easily made at home. Courtesy of "Best Way"

longer it is the better, as the toy will work for a longer period. It is necessary to support the stand either by a weight at the back or a small G clamp. The toy can be made more realistic by fitting it on a platform

and making a small good trough under the head. A development of this kind of toy is made by arranging two parrots on a strip of wood and connecting the strings to a pendulum, or cutting the shape of two men holding a hammer and striking an anvil, which is arranged between them.

The pole cart in Fig. 8 is composed of two sides nailed to end pieces and to a base. Cast-iron wheels are screwed to axle blocks, and the handle, which is fitted to a projection in front, is so arranged that it will not fall down further than an angle of 30° in front. The two sides are 16 in. by $8\frac{1}{2}$ in. by $\frac{3}{4}$ in. the ends 9 in. by 7 in. by $\frac{1}{2}$ in., and the bottom 20 in. by 10 $\frac{1}{2}$ in. by $\frac{1}{2}$ in., planed up and finished smooth, preferably from a hardwood such, for example, as birch or elm.

The sides of the cart should be securely nailed or screwed to the ends and the bottom attached in the same way. The axle blocks are 12 in. by 2 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. and must be of hardwood. One side is quite straight, and the other shaped to 1 in. deep at the ends from a line drawn 3 in. each side of the centre, and the ends cut off with a chisel to an octagonal form.

One of the axle blocks is screwed to the bottom board 1 in. from the end; the other, as in Fig. 9, is slotted to take the dovetailed end of the projection to carry the handle. Plane up a length of hardwood to 11 in. by 4 $\frac{1}{2}$ in. by $\frac{1}{2}$ in., reduce the end to 2 $\frac{1}{2}$ in. wide and cut a 2 $\frac{1}{2}$ in. long by $\frac{3}{4}$ in. slot at the

small end, undercutting it $\frac{1}{4}$ in. The dovetail to fit in the slot in the axle block should be sawn out and the piece glued to the block. A thin washer is cut from a piece of tinued sheet and the axle block is screwed from the centre of the bottom and 5 in. from the end, with an ordinary washer under the screw head and the thin washer between the block and the bottom.

The pole or handle is planed to 22 in. by 1 $\frac{1}{2}$ in. by $\frac{3}{4}$ in., one end is sawn off to an angle of 30°, and the other rounded and fitted with a 3 $\frac{1}{2}$ in. length of $\frac{1}{2}$ in. dowel. The handle is fitted to the slotted projection with a stout wire nail or a rivet. The wheels should be 3 in. diameter, and preferably of cast iron. Wheels made of some close-grained wood may be used instead, or metal wheels fitted with rubber tires. The wheels should be attached to the axle by means of stout round headed screws washers being provided in the case of wheels fashioned in wood. The latter should also be bushed with a piece of brass tube.

Cranes can be made stationary as in Fig. 10 or to travel, in the latter case a truck being made as indicated at Fig. 11. The parts of the stationary crane are given in Fig. 11. The base is 9 in. by 4 in. by $\frac{1}{2}$ in., and the uprights to hold the winding gear are 3 in. by 3 in. by $\frac{1}{2}$ in. with one corner sawn off to leave 1 in.

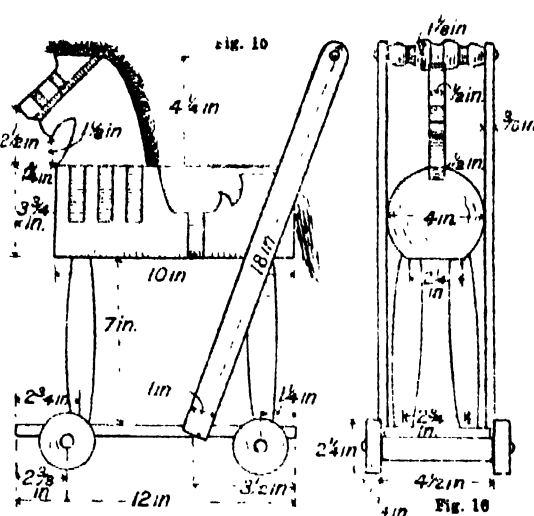


Fig. 10. Push horse shown in side elevation, with dimensions. Fig. 11. End elevation of the push horse.

The winding roller is cut to 3 in. from a length of 1 in. or 1 $\frac{1}{2}$ in. round, axles being provided by suitable lengths of hard brass wire fitting through holes bored in the sides of the uprights. The latter pieces are nailed to the base with a 3 in. by 1 in. by $\frac{1}{2}$ in. piece, and a 4 in. length of $\frac{1}{2}$ in. dowel between at the end to strengthen the base, as shown.

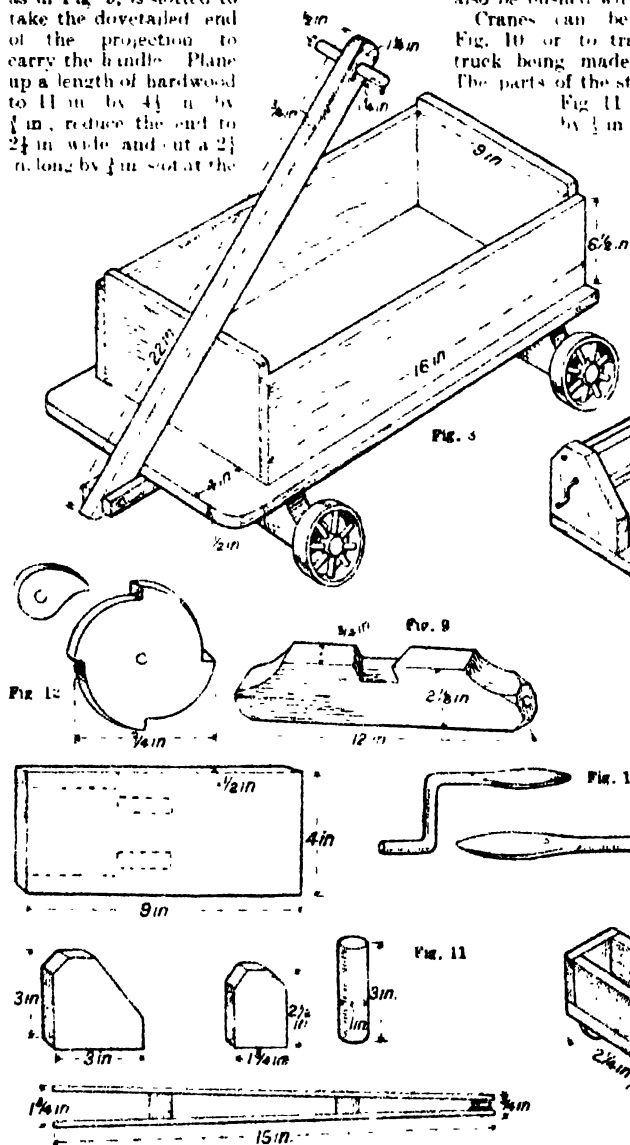
The uprights to support the base of the arm or pole are 2 $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ in. by $\frac{1}{2}$ in.; they are tenoned at the ends, fitted into slots in the base, and the top corners trimmed off. The slots or mortises in the base are 3 in. from the end and $\frac{1}{2}$ in. apart; the arm is made from two pieces 15 in. by $\frac{1}{2}$ in. and tapered evenly from 1 $\frac{1}{2}$ in. to $\frac{1}{2}$ in. Two $\frac{1}{2}$ in. thick blocks are prepared for fitting between the lengths.

They must be shaped to allow of a width of 1 $\frac{1}{2}$ in. at the bottom and sufficient to take a small grooved pulley at the top. The ratchet wheel and catch in Fig. 12 are made from a piece of sheet brass. The method of flattening the ends of the wire for the axle, together with the handle, is shown in Fig. 13. The arm is held in position with suitable lengths of small brass chain, and similar material can be used for the rope, a hook being fitted on the end.

The travelling crane in Fig. 14 is shown in a small size, but if the main proportions are retained it can be built much larger. The number of parts have been reduced as low as possible, and the construction could hardly be more simple.

Dimensions for a push horse are given in the elevations in Figs. 15 and 16, and represent a medium size. The body is cut to 10 in. from a round of 4 in. diameter, and flattened at the bottom; the legs are 10 in. by 1 in. diameter, tapering to $\frac{1}{2}$ in. at each end. The head is shaped from a piece of 5 $\frac{1}{2}$ in. by 4 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. and let in to a depth of $\frac{1}{4}$ in. The base is 12 in. by 4 in. by $\frac{1}{2}$ in., with 1 in. square lengths underneath to screw the wheels to, the latter being 2 $\frac{1}{2}$ in. diameter and $\frac{1}{2}$ in. thick if of wood, as is usual.

The handle is formed with two 18 in. by 1 in. by $\frac{1}{2}$ in. lengths, with a 4 in. length of 1 $\frac{1}{2}$ in. diameter round between, these pieces being joined together with 1 $\frac{1}{2}$ in. wire nails. The saddle and harness is usually formed with



Toy. Fig. 8. Pole cart with small cast iron wheels. Fig. 9. Axle block slotted for handle fitment. Fig. 10. Stationary crane. Fig. 11. Component parts of the stationary crane. Fig. 12. Ratchet wheel and catch. Fig. 13. Axle and handle. Fig. 14. Simple travelling crane.

coloured paper, such as the imitation morocco paper used by bookbinders. The mane and tail can be made from a piece of an old skin rug. By fitting a projecting block to the front axle a pole can be fitted, in the same way as for the pole cart, that will enable the horse to be pulled instead of pushed.

TOY DOG. This name is given to various small dogs which are sufficiently diminutive to be carried on the arm of their mistresses. They are obtainable in many breeds, the Pekinese being one of the most popular, while Pomeranians and Yorkshire terriers are also much sought after.

The original toy terrier, which was only obtainable as a toy dog, is not so often seen since breeders took to breeding small dogs of other and more attractive types. The Belgian griffon is another favourite, while the King Charles was perhaps the first of all, and still maintains its popularity to a great extent. With Yorkshires, Pomeranians, pugs, and the like, it must be specially mentioned if a toy size is required, as they are also bred to their normal sizes. *See Dog; Japanese Spaniel; Pekinese; Pug.*

T PLATE. Steel or iron plates in shape resembling the letter T are sometimes employed to strengthen the joints of woodwork. They are arranged in pairs, one on either side of the joint, and bolted right through the timbers, holes being provided in the wood and the plates for this purpose. T plates are also placed on the top and the vertical posts of a queen-post truss.

TRACHELOSPERMUM. This is an evergreen climbing shrub for greenhouse cultivation, sometimes known as Chinese jasmine or Chinese ivy. The best species is *jasminodes*, which produces fragrant white blossoms from June to August and reaches a height of 12 ft. It should be planted in spring in pots of fibrous loam, peat, and sand, or in well-drained borders, training its twining growth to trellis or walls. The plant should be pruned slightly after flowering.

TRACING: On Paper. The operation of transferring a drawing or picture by means of prepared paper can be done in two ways. A sheet of tracing paper, which is a specially prepared semi-transparent paper, is placed on the drawing, and the lines underneath are drawn over with a pencil. This method of providing a duplicate of a prepared drawing is used by architects and builders as well as woodworkers and engineers, but tracing cloth is often employed instead of the paper, as it is not so easily torn. Duplicate plans and elevations can be made in this way, colouring being done with coloured inks or water colours.

Another method of transferring drawings is to trace them through a sheet of carbon paper placed underneath the drawing. This method is useful for transferring designs on to metal, wood, and other materials.

In all tracing it is necessary to keep exactly to the original lines; at the same time it gives the skilled draughtsman an opportunity of correcting faulty lines on the original. In using carbon paper, it is advisable to pin the drawing at the top so that the progress of the work can be followed otherwise it may be found on the completion of the work that important details have been omitted. *See Drawing; Embroidery; Plan.*

TRADESCANTIA. This is the name of a genus of hardy herbaceous and greenhouse plants. The favourite hardy kind is the Virginian spiderwort (*virginiana*), 2 ft. high, which bears purplish-blue flowers in summer and will thrive in ordinary soil in a shady border. It is known as Flower of a Day, because the individual blooms soon fade, but the plants flower throughout many weeks. The greenhouse species are valuable trailing



Tradescantia Trailing foliage of a greenhouse variety of this plant

plants which will flourish in soil beneath the greenhouse staging, or if grown in pots they form an attractive edging. They may also be planted in hanging baskets. A compost of loam, leaf mould and sand suits them and they are very easily increased by cuttings.

TRAGACANTH. This describes a gummy exudate from a Syrian tree, which has the property of swelling into a gelatinous mass when added to cold water, and has a soothing and demulcent action when applied to irritated mucous surfaces. It is an ingredient of some throat lozenges, but its chief use is as a means of holding in suspension insoluble powders, resins, and oils.

TRAINING: Of Plants. During the first few years of growth the training of fruit trees is of paramount importance. The nursery specialist supplies young trees in various shapes, chiefly bushes, pyramids, standards, cordons espaliers, and fans.

Bush Trees. Bush trees are the best all-round kinds for the amateur. They are easily accommodated to limited space if kept properly trained, and are particularly suitable for simple cultivation and the production of such utility crops as apples, pears, plums, gooseberries, and red, white, or black currants. Yearling maidens of apples, pears, and plums usually consist of one main stem which is shortened during winter to about six buds. The following season these buds will produce leader and side shoots, all of which will require shortening to about one-fourth their length. During their third season they will develop further, leading and lateral growths, one of which should be permitted to grow

at the extremities of each branch, all laterals being reduced to their fourth leaf.

Gooseberries and red and white currants can be raised from simple cuttings, denuding each of all its buds except the three top ones. These will produce three shoots, all being allowed to continue growth until the fall of the year, when they are cut back about half-way. Thus, the following season a larger number of shoots will progress, these in turn being reduced in length during the winter. The next year they will require summer pruning of all laterals, with another slight trimming during winter. In preparing cuttings of black currant none of the buds must be taken off.

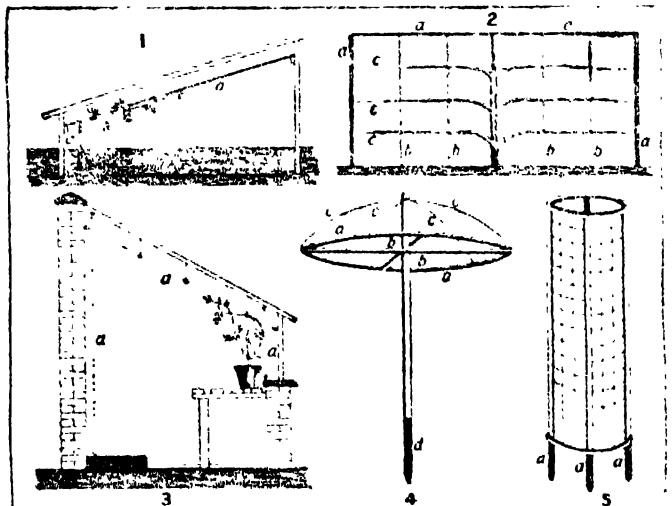
Pyramids. Pyramids are suitable for apples, pears, plums, and cherries, and are trained by cutting back a maiden tree to about 12 in. from its stock as a result of which leader and side shoots will appear. During winter the leader should be reduced by about one-third and laterals by half, staking the former securely to keep it upright. Subsequent training is similar to that for bushes, but particular care must be taken to ensure pyramidal shape.

Standard Trees. These have a clear stem of about 6 ft. and a head of branches which develops from the uppermost buds. Every winter for the first few years the season's main shoots should be cut back by about half to ensure a foundation of strong branches. Care must be taken to keep them about 2 ft. apart to prevent overcrowding in subsequent years. Side shoots should be pruned to two or three buds each winter for the first few years, but established trees are pruned chiefly by thinning out superfluous shoots and branches. Half standards, which are on stems about 4 ft. high, are treated in the same way.

Cordons. Single cordons are trained from a maiden stem and cut back about half-way during winter. The resultant leading shoot is then permitted to grow on, all side growths being carefully reduced to two buds in winter. This procedure is continued until the stem is well furnished with fruiting spurs.

Double cordons are trained by allowing two shoots to grow on after the first pruning back of the maiden stem. Another form of cordon is horizontally trained, its two cordons being trained to strong horizontal wires about a foot or so from the ground, to which point the primary cutting back of stem is carried. Apples, pears, red and white currants, and gooseberries all do excellently in cordon form.

Espaliers. Espalier is a term given to the method of training fruit trees on supports of



Training of trees and plants. 1. Method for frames: a, cane or wire supports. 2. Espalier for fruit: a, wood; b, canes; c, wire. 3. Greenhouse trainers: a, rings, ringed staples and wire. 4. Garden trainer for weeping roses or climbers: a, child's hoop; b, cross strainers; c, wire; d, wooden support with tared base and holed apex. 5. Garden trainer of wood and netting for sweet peas: a, tared bases for insertion in soil.

iron, stout wire or wood, as useful and decorative margins to walks of kitchen gardens, trees thus trained being known as espalier trees. Such trees are almost beyond the average amateur and therefore should be obtained ready formed from a fruit specialist. Treatment subsequent to planting is merely training to supports and suitable pruning to maintain and increase fruiting spurs.

Fan-trained trees, also, are best secured from the specialist. This type is suitable for the cultivation of apples, pears, plums, peaches, figs, and cherries on walls. See Wall.

The Diagram Explained. The diagram shows also methods of training adaptable to roses of a weeping character, and also to greenhouse and outdoor plants. Fig. 1 shows a simple fixture for frame culture of cucumbers, tomatoes, and plants of similar habit. It consists of a simple stem support, with a top length of cane or stretched wire from front to back of frame. Fig. 3 gives at a glance an excellent wiring method of training plants in a lean-to greenhouse, the principles of which may easily be extended to the full-span or any other type of house.

Fig. 4 is an umbrella trainer of particular value for the display of standard weeping roses or other drooping plants, its simple components being merely a child's hoop, an upright with cross pieces, and a sufficient quantity of stout wire. Its construction is quite easy to follow from the sketch. Fig. 5 is another simple but useful type of trainer specially suitable for sweet peas, but handy also for climbing nasturtiums and plants of similar habit. It may be constructed of two circular pieces of wood—butter-tub hoops will do quite well, these being attached to four fairly stout uprights as sketched. The bottom ends of the uprights should be tarred or creosoted to prevent decay. Wire, or preferably rot proof string, is then arranged, tubular fashion, securely to hoops and uprights, thus forming an inexpensive contrivance. This is particularly effective for sweet peas when grown in tubs. The netting employed should have a good open mesh.

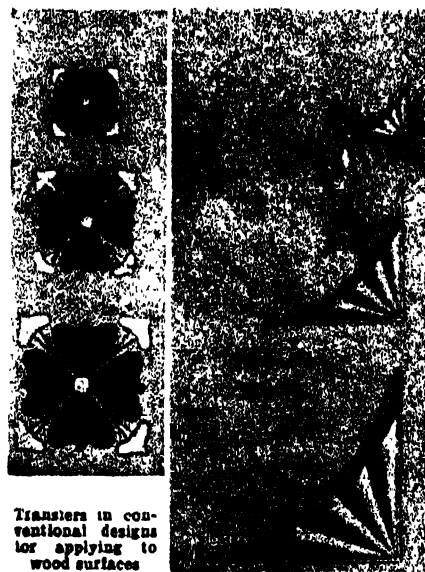
TRANSFER. Designs printed on thin transparent paper and capable of being transferred to other surfaces are known as transfers. They can be bought from most fancy needlework shops and artist's colourmen and are obtainable in flower, fruit, and other designs. They are used for embroidery, beadwork, painting on glass and textile fabrics, pattern printing, leather work, gesso and barbola work, batik, and for transferring designs on to lampshades.

To use a transfer on a textile fabric, place the latter on an ironing table with the right side upward, then pin the transfer to it with the waxed side down, and press with a moderately hot iron. If the material is thin, the flat of the iron should not be used, otherwise the wax may spread and cause disfiguring marks. The heel of the iron may, however, be used without harmful results. When painting on transparent materials such as gauze or fine georgette, the design may be tacked underneath the fabric, or the latter may be pinned over the transfer on to a board.

Transfers can be used several times, even though the wax has been ironed off, for the outline still remains. They are also used in the following manner for transferring to paper, parchment and prepared wood surfaces: Cover the portion of the fabric to which the design is to be transferred with a sheet of carbon paper, lay the transfer on top, and pencil over all the lines.

Various women's periodicals specialize in transfers for embroidery and designs which may be adapted for other art crafts.

Transfer for Applying Decoration. Another kind of transfer is specially prepared for applying decoration to various materials in



Transfers in conventional designs for applying to wood surfaces

the form of lines coloured designs, and pictures. Imitations of painted decoration, marquetry work, bandings, stringing, sign writing, graining, floral patterns, and pictures in miniature can be obtained in the form of transfers.

In applying transfers to wood, the surface must be perfectly smooth and clean, and preferably bodied up with french polish although this is not essential. The exact position of the transfer must be marked lightly, the outlines of the design being indicated on the back of the transfer, so that it is not difficult to place the paper in the correct position. First cut away most of the unnecessary paper surrounding the edges of the transfer, leaving a margin of about $\frac{1}{4}$ in.

The face of the transfer is wiped over with a clean duster, and then with a small, stiff brush it is given a thin coat of gold size. The paper is then placed on one side, free from dust, for the size to dry. A suitable size can be made by dissolving $\frac{1}{2}$ oz. of best gelatine in 1 pint of water. If the wood has been bodied up, the surface should be rubbed down with powdered pumice-stone placed in a pounce bag and finally wiped over with a clean, dry rag.

The transfer is ready for application when the gold size is tacky. On no account must the surface be wet. It can be tested by placing the end of the finger on it. If the finger sticks without pressure the surface is not dry enough, but if a little pressure is needed to make it stick to the finger it is ready for application. If the transfer is on duplex paper, it should be divided and the thick backing paper thrown away. The surface of the transfer is carefully placed in position and well rubbed into contact with the work. It should be noted that when once the transfer has been placed on the wood

it cannot be shifted without spoiling it. It is therefore best to commence with one corner and gradually press it into contact. This method also minimizes the chance of air bubbles appearing under the transfer when finished.

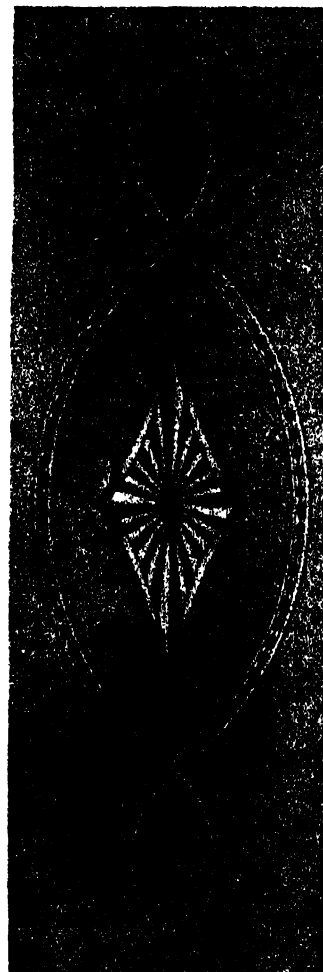
Immediately the transfer has been pressed well down on the surface, rub it further into contact with a slightly damp sponge. The sponge is dipped in warm water to wet it thoroughly, and the paper surface of the transfer is wetted, allowing about 5 min. for the water to soak in. One corner is lifted up and the paper is peeled off, leaving the design on the wood. The coloured surface is tightly washed over with the wet sponge, working from the centre to the outside, and it is then dried by gentle pressure with a clean cotton rag. If there are air bubbles, they may be removed by pricking with a needle point and pressing the transfer down with a wet finger tip.

On no account should the transfer at this stage be touched with a dry finger, as the paint will stick to it and spoil the work. The superfluous gold size round the edge of the transfer can be removed by dipping a dry sponge in turpentine and wiping over the transfer from the centre to the outside until all traces have disappeared. This operation should not take more than a few seconds or the turpentine will attack the paint and dissolve it. Directly the size has been removed, the surface should be wiped dry with a clean cotton rag. When dry the colour will harden, and can be coated, if desired, with a transparent polish.

The method of applying coloured transfers or linings to polished metal surfaces is somewhat similar, but special care will be needed to

fit the paper on curved surfaces, otherwise the finished work will appear slovenly. In transfers of lines making a panel with ends, these portions should be applied first and then joined up with butt and not overlapping joints. To make an effective join, the length of line between the end portions must be accurately measured, and, in the case of the end pieces as well as the lines, as much of the outside paper as possible should be cut off. See Embroidery.

TRANSFORMER: In Wireless. This is an apparatus for converting an alternating current from one voltage to another and more convenient voltage. The simplest form comprises two windings, a primary and a secondary, and these are coupled to each other so that energy is transferred from the primary to the secondary by electromagnetic induction. An iron core is almost invariably used in order to increase the inductive effect. This core is laminated (built up in layers) so that losses due to eddy currents are minimized. When the primary winding is connected to a source of alternating current supply, a magnetic flux is set up which becomes linked with both windings, the voltage per turn being the same in each winding (neglecting losses). The



Transfer applied to wood in imitation of decorative inlay work

voltage across the secondary winding is, therefore, directly proportional to the ratio of the number of turns on the secondary to the number of turns on the primary. Thus, if the ratio of secondary to primary turns is three to one the voltage across the secondary terminals will be three times the voltage across the primary terminals.

In this case the transformer would be referred to as a "step up" transformer. When the voltage is reduced (the secondary winding having fewer turns than the primary) the transformer is of the "step down" type. In the transformer used in a mains wireless receiver there may be several secondary windings, each producing a different voltage from that of the supply to which the primary is connected. For example, there may be a low voltage for the filaments of the valves ("step-down") and a high voltage for the anode circuits.

One of the most frequent sources of trouble in the cheaper mains sets is the "burning out" of the transformer. This may not necessarily be an actual fusing of the wire in the device, though this sometimes happens; the term "burning out" is also applied by wireless engineers to a fracture of the wire due only indirectly to heat such as may follow a crystallization or corrosion of the metal. Although separate secondary windings are frequently used for the production of different voltages from the one transformer, it is also a common practice to take tappings from the one secondary winding. Also, primary windings of "mains" transformers are often "tapped" so that the wireless receiver can be adjusted easily by that means to different supply voltages. Some transformers are provided with "centre taps"; the input transformer in a "push pull" circuit has its secondary winding so designed, and it becomes a double secondary with centre point electrically connected to valve filaments.

Transformer Coupling. This is a method of coupling wireless receiving valves in cascade for amplifying at high or low frequency. In a high-frequency transformer the secondary is usually tuned and the primary is untuned, the number of turns on this winding being adjusted to give the required degree of selectivity. The coupling between the two windings is normally fixed, and the degree of selectivity will be minimum when the transformer has a turns ratio of 1:1. Decreasing the number of turns on the primary increases the selectivity but may decrease the energy transfer between the primary and secondary circuits, and therefore the sensitivity. In practice it is necessary to effect a compromise with the object of achieving good sensitivity and selectivity.

Transformer coupling is employed in low-frequency magnifiers, and provides greater magnification per stage than either resistance-capacity or choke coupling. A good low-frequency transformer should possess a high primary inductance and a secondary winding of low self-capacity.

A high primary inductance ensures an adequate amplification of the low notes, but it is essential that the valve connected in the primary circuit should have an appropriate A.C. resistance or impedance. Suitable types of valves are usually recommended by the makers of the transformers, and these should be employed. The high-tension voltage must be adjusted so that the current flowing through the primary winding is within the limits specified for that particular transformer.

TRANSMISSION: In Motor Cars.

Transmission is the mechanical means by which the power developed by the engine is transmitted to the road wheels.

The usual lay-out of the transmission in a four-wheeled vehicle consists of the clutch, the

gear box, propeller or cardan shaft and the live or back axle. Two other lay-outs are clutch and gear box as a part of the engine unit, and the gear box as a part of the back axle unit. Of the three the second is the most common, and the third is seldom met with. The clutch, of whatever type, forms part of the flywheel or is directly connected with it. In the three-unit system (independent gear box) the driven member of the clutch is connected by a short shaft to the primary shaft of the gear box. A universal joint is fitted at each end of the clutch shaft so that in the event of chassis distortion undue strain will not be placed upon the bearings of the gear box and the clutch spigot.

The propeller or cardan shaft, if of the open type, is fitted with a universal joint at each end, one of which is designed for sliding as well as universal movement. This feature is necessary owing to the difference of centres between the axle and the spring anchorage and that of the gear box and the cardan shaft. With the enclosed cardan shaft one universal joint only is provided at the gear-box end, the springs being anchored by shackle plates at both ends. The road wheels of the back axle are driven by either bevel or worm gearing through the medium of the axle shafts and the differential gear.

The clutch and gear box unit construction follows exactly the same lines, except that a clutch shaft fitted with universal joints is dispensed with. A short semi-floating shaft entirely enclosed takes its place, and a longer cardan shaft is necessary which may be either of the open or the enclosed pattern.

In the third system, gear box and back axle unit construction, the drive is transmitted by a cardan shaft, fitted with universal joints at each end, if of the open type, and one universal joint at the clutch end if of the enclosed pattern. As a rule the clutch is provided with a short shaft that goes to a bearing at about the position usually occupied by the gear box. The cardan shaft is universally jointed to the clutch shaft at this point. The object of this is to relieve the clutch mechanism of the lateral strains imposed as well as to reduce the length of the cardan shaft.

Chain transmission is now found only in the motor cycle and a few three-wheelers. For the motor cycle the transmission is either solely by silent roller chain, or by chain from engine to gear box and thence by another chain to the back wheel.

To revert to the motor car forms of transmission, there are, of course, other principles that have been tried, such as hydraulic, electric and patent devices that give an infinite number of gear reductions, also the friction drive, formerly used on some light cars.

Fluid Flywheel. This is a hydraulic transmission device introduced by the Daimler Co. The mechanism, which replaces the ordinary clutch, consists of two cup-shaped members facing each other—the one, filled with oil, attached to the crankshaft, and the other, enclosed by the driving cup, rotating with the first motion shaft of the gear box. Both cups are divided off by radial webs into a number of cells, and the adjacent edges of the two sets of cells (in driving and driven members respectively), are separated by a narrow gap. When the driving cup revolves, the oil receives a circulatory motion and, in passing to the driven member, gives up its energy to the latter, so rotating it. At very slow engine speeds the amount of slip is large, and practi-

cally no drive is transmitted, but as the engine is accelerated the slip quickly diminishes until at normal speeds the loss is only about 2 p.c. Thus the device acts automatically.

Loss of road speed and of general efficiency, often attributed to minor engine faults, can frequently be traced to neglect and want of lubrication throughout the transmission. Such parts as the universal joints of the cardan shaft should be frequently looked to, because, apart from rotary movement, they have also to bear a considerable movement that is set up by the varying axle position in relation to the chassis.

It is perhaps seldom realized that when the car is travelling on top gear the clutch shaft and cardan shaft, including all the universal joints, are revolving at engine speed—a fact that easily accounts for the rapid wear that takes place unless proper attention is paid to lubrication.

A worn universal joint should be immediately replaced or rebushed and new pins fitted otherwise a fracture may easily occur owing to the severe blows imparted by the torque of the engine. In the case of chain drive it is imperative that the sprockets in the system should be dead in line. All worn parts should be attended to, as it is through neglect of these that transmission noise is caused.

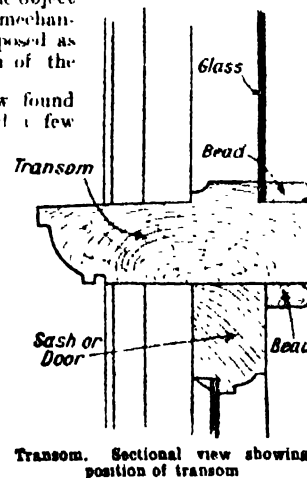
With reasonable care and intelligent driving, transmission wear or risk of breakdown should be negligible in the modern car. The driver, however, of a moderate powered car who is afraid to use his gear box and forces his engine to labour on lulls, or after turning a corner is placing severe strain upon the transmission system at every point from the clutch to the back axle. See Clutch, Differential Gear, Gear, Live Axle, Motor Car, Motor Cycle, Propeller Shaft.

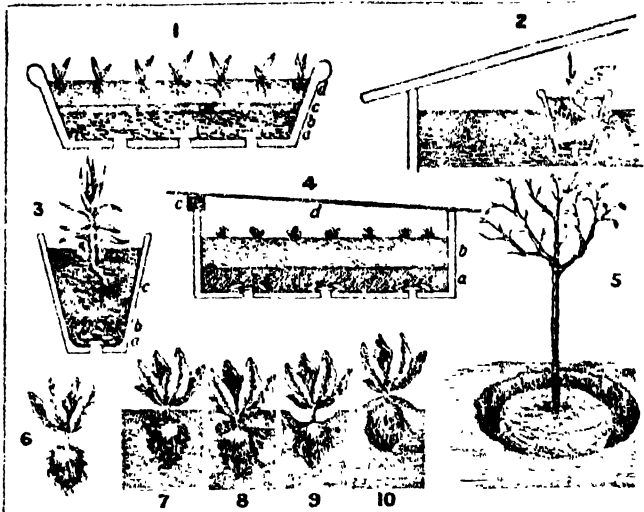
TRANSOM. The prepared piece of wood which divides the upper glazed portion of a window or door frame is usually known as the transom. In casement and French windows, or doors with a glazed opening above the transom serve also as the door head. In an ordinary window of this type, the transom would be about 6 in. wide and 2 in. thick on the inside, tapering on the top surface to a thickness of 1½ in. outside the window. This is technically termed weathered and is designed to throw off the water. A groove is generally cut underneath to prevent water running along to the sash, or, to use the technical terms, the underside of the transom is throated.

In many windows, the transom is bevelled off from its highest point. Casement windows or sash windows with a fixed or fan light above are called transom windows. This type of window is often made in metal, but the division between the small upper portion and the lower portion is still called a transom. See Casement; French Window; Window.

TRANSPLANTING: Of Plants. Carelessness in transplanting is the cause of many failures in the garden. Plants, whether seedlings or mature specimens, should be lifted from seed box or open ground with a good ball of soil if possible, but always with their fibrous roots intact. Care of these roots is of paramount importance, for it is their hair like tendrils that collect the nourishment upon which the health of the plants is entirely dependent.

After plants have been lifted they should never be left exposed to the air, but should





Transplanting. 1. Transplanting streptocarpus. a, crocks; b, rough; c, peat; d, fine soil. 2. Lapageria rooted cutting detached from parent, transplanted to pot and plunged in a frame. 3. Transplanted tree carnation layer: a, crocks; b, broken turf; c, compost; d, sand. 4. Calceolarias transplanted to box: a, leaves; b, soil; c, ventilating block; d, glass. 5. Transplanting a standard, showing circular trench to be filled with water before lifting tree. 6. How to lift a seedling. 7. Same transplanted correctly. 8. Transplanted too deep. 9. Dry weather transplanting. 10. How to transplant on wet soil.

be transferred to their new quarters or deposited in a shady place. The smaller kinds should be covered with wet moss and soil and large specimens such as roses and fruit-trees enclosed in sacking and drenched with water. They should be replanted at the earliest possible moment, when the sun is down, and watered frequently until they are again established. Syringing during the evening will be of additional benefit, particularly in the case of transplanted evergreens.

TRAP. This word has three main meanings, as far as the household is concerned. It refers to a piece of mechanism widely employed for catching obnoxious insects and animals, such as beetles and mice. It means, secondly, a contrivance used to hinder the passage of foul air from a waste pipe. Thirdly, a small passenger-carrying vehicle which is drawn by either a horse or a pony. See Beetle Destruction; Dog Cart; Drains.



Fly Paper, Mice, Pipes; Rat; Vermin.

TRAP DOOR. The general use of a trap door is to close an aperture through a floor, ceiling or roof. It is a horizontal door and usually consists of stout boards jointed together and strengthened by cross battens. The framework round the trap door must be strong enough to support any load which may be brought upon the floor.

A commonly adopted plan is to make an aper-

necessary to clear the battens. The upper surface of the floor is cut back so as to reveal about half the thickness of the joists and this is then filled in with a mitred framework.

The trap door should be very solidly constructed and fit the hole accurately, and when in position should be flush with the normal surface of the floor. It requires to be properly hinged with cellar or trap door hinges. These comprise three parts: two are fitted to the framework and the trap door, and the third serves as link connecting the other two, there being two hinge points, one near each end of the link. The trimming has to be cut away so that the flap hinge can be sunk into it with its upper surface level with that of the floor. Fig. 1 illustrates this type of hinge and the mode of recessing the timber for its reception.

When the trap door does not exceed about 21 in. square, ordinary butt hinges may be used. These are fitted vertically into the joint between the trap door and the floor boards, as illustrated in Fig. 3. Good stout screws should be used to secure them, the hinges being of the malleable cast variety, or of some other kind that possesses sufficient strength to stand the strain.

To enable the trap door to be lifted, it is desirable to fit a small ring handle, such as that shown in the illustration, and, to prevent the trap door being opened, it is a wise precaution to provide it with a couple of bolts on the underside.

Loft Doors. When fitting a small trap door for access to a loft, or other similar part of a

ture between two or more joists or rafters, bridging the space between them with stout timber about 25 per cent thicker and equal in depth to rafters or joists. These timbers are known as trimmers and should be tusk tenoned to the others. Intermediate rafters or joists that have to be cut to form the aperture are mortised and tenoned into the trimmers.

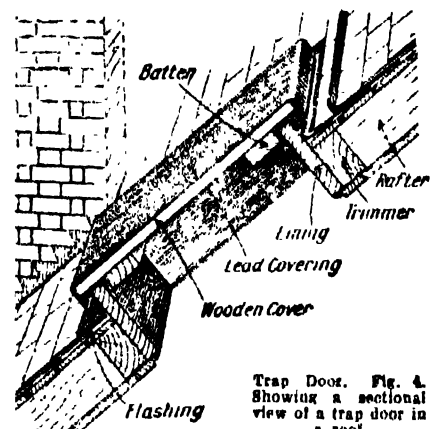
In the Floor. Fillets of wood are in the majority of cases fitted around the inner faces of the trap hole with their upper surfaces at such a depth as is necessitated by the thickness of the trap door. Notches or openings are cut in the fillets where

building, its width should not be greater than that between two joists, and then it will suffice to fit two cross members between them and secure them with stout spikes driven through the ceiling joists. The trap door can be composed of floor board with cross-pieces of 3 in. by 1 in. deal, screwed to the upper side as in Fig. 2. This rests on fillets in the aperture.

As commonly fitted, the trap door giving access to the space above the ceiling of an upper storey is made of stout matching, and has no lunge. It rests on a lining fixed to the trap aperture and is simply pushed upward into the loft to open the trap.

Roof Doors. Trap doors when fitted into a roof are usually made to lift off bodily, although examples are found in which the lugged flap is used. However it may be arranged the outer surface must be covered with weather-proof material, such as sheet lead or zinc.

A cross sectional view of an external trap door is shown in Fig. 4, the aperture through the roof being framed up with trimmers. The inner faces of the opening are lined with stout timber projecting several inches above the normal roof surface, and covered by a flashing (q.v.) of lead or other material to ensure a water-tight joint. The trap door



Trap Door. Fig. 4. Showing a sectional view of a trap door in a roof.

should be several inches larger each way than the trimming, and should fit on a bed, or fillet on the under side, to keep it in position. The outer edge of the door is preferably fitted with a small, downward projecting batten of wood and the whole covered with lead. The lead is turned under the outer batten to provide a drip for rain water. Two stout bolts should be located about the middle of the trap. See Attic; Cellar; Ladder; Loft.

TRAVELLER'S JOY. This is the popular name of *Clematis vitalba* (old man's beard), a rampant climbing plant. It bears a profusion of white flowers which are followed by fluffy fruits. This plant is used as a stock on which to graft named, large-flowered varieties of clematis.

TRAVELLING BAG.

Several of the receptacles employed for luggage are covered by this term, which is applied to suit cases, Gladstone bags and kit bags amongst others.

Bags made of leather should be rubbed over from time to time with neat's foot or harness oil if a polished surface is not required, but, as the small leather bag is usually finished with a polished surface, the best treatment is with a good white or brown boot polish. To renovate an old leather bag, the grease and dirt



Trap Door. Fig. 1. How the flap hinges are fitted. Fig. 2. Making a small trap door of floor board with deal cross pieces. Fig. 3. Simple lifting device consisting of a small ring.

must be removed with a strong solution of common soda, in the proportion of 2 oz. of soda to a pint of hot water. Apply the soda water with a soft rag when warm, not hot, and if very dirty rub the material with a brush. If the leather is stained, a weak solution of oxalic acid will generally remove the marks, but it should not be applied until the soda solution has been used. The cleaned surface should be washed with lukewarm water and placed in the sun or a warm spot away from the fire to dry.

The leather should now be treated with a wax polish applied with a soft rag, rubbed in

with a soft brush and then polished with a clean cloth. *See Luggage, Suit Case; Trunk.*

TRAVELLING RUG. A good travelling rug is an expensive article when made of thick pure wool. A favourite type has a plaid design with fringed ends. Others are woven in reversible colours. Large numbers of travelling rugs are manufactured for car use in fur fabrics, real furs made up into the standard oblong or square shapes and lined with cloth leather lined with a woollen check material, and livery cloth, or some waterproof material lined with wool.

glass dishes for hors d'oeuvres. Early morning tea trays are often made of stainless composition and surrounded by a wicker-work border. A useful wooden breakfast-in-bed tray is illustrated in Fig. 11. This type of table tray is light to carry and more comfortable to eat from than a tray placed at the side of the bed.

Making Trays. There are several forms of construction suitable for trays. The simplest method perhaps is that in which special metal corners are used in conjunction with a simple moulding having a rounded top edge. Plywood forms the bottom of the tray. Figs. 1 to 4 show progressive stages in making a tray, and are self-explanatory. The moulding, copper corners and suitable copper nails can be had from any good suppliers of material for woodwork hobbies.

Another simple method of tray construction is to screw mitred lengths of moulding on the top of a wooden base, as in the section at Fig. 5. The base should be of oak-faced plywood about 1 in. thick. The use of a rebated moulding is shown in the lower section, the finished tray being seen in Fig. 6. If the decoration is effected with transfers the surface must be thoroughly cleaned with glass paper and well bodied in with french polish. The position of the transfer decoration can be marked with a chalk line, which should be then, a length of thread passed over a piece of chalk will provide a suitable line.

The directions for laying the transfer should be carefully followed. On no account should the work be hurried, and when in position the wood should be placed on one side to allow the surface of the transfer to harden. A final coat with a transparent polish or varnish should be

TRAYS: SHAPES, STYLES AND MATERIALS

Choosing, Decorating and Making for all Household Needs

Several articles in this work describe the materials or processes used in making and decorating trays, e.g. Lacquer Work, Papier Mâché, Repoussé Work, Tars, *See Silver, Sheffield Plate, Silver, also Ash Tray, Fruit Tray.*

No housewife need have an ugly tray even in the kitchen, as the plainest variations in tin, papier mâché, stainless composition, and lacquered wood are obtainable in good colours at fairly moderate prices. Oak trays with handles are always useful as waiting trays when laying or clearing the dining-room table.

Veneered and mild mahogany trays of Sheraton style should be provided with a glass top to fit inside the border. Such trays when solidly constructed are apt to be rather heavy. If it is desired to use one as a tea tray, it can be laid on the table with the cups, and the teapot, etc. carried in on a lighter tray and placed on it. The same method of service is often resorted to with old Sheffield plate and other metal trays.

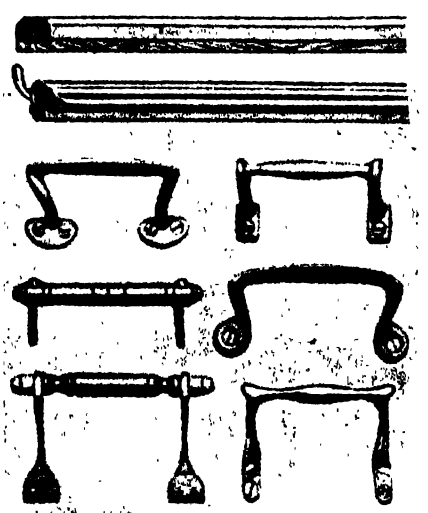
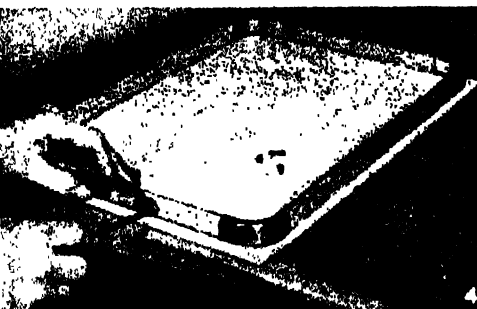
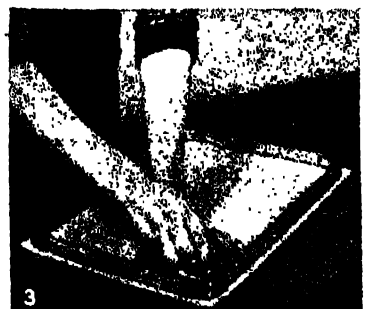
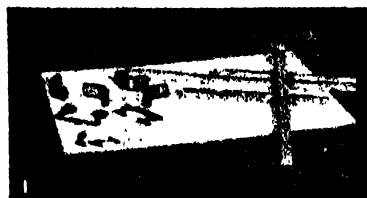
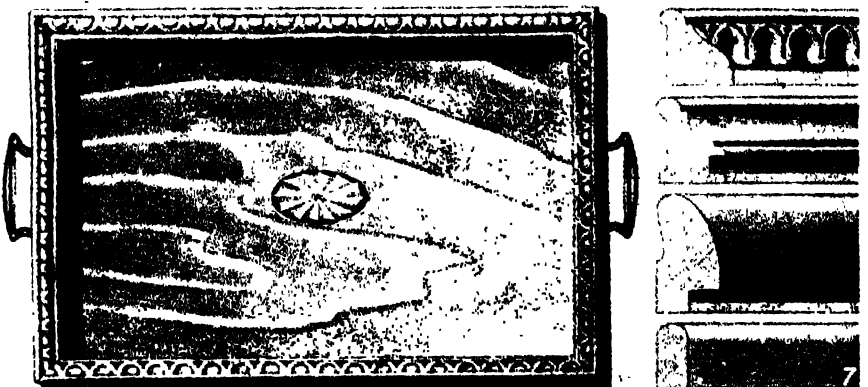
A pretty tray with handles suitable for after-dinner coffee service is made of mirror glass framed in polished steel. This idea can be adapted by the home worker, the tray being made up with a wooden moulding and bottom to fit a piece of mirror glass of desired size. The moulding should be silvered or gilded with metallic paint and handles should be attached as shown in Fig. 4.

Small trays for occasional use are made of papier mâché. These may be bought finished in black with gilt stars, or in some light colour. A further suitable decoration when something more uncommon is liked is to cut out large roses from a flower seed-man's catalogue, paste and varnish them on to the centre of such a tray, maintaining the Victorian aspect of the papier mâché foundation. Another idea is to embellish the tray with pictorial patchwork. (*See page 1002.*)

There are many ways of ornamenting trays constructed on the simple methods described

in this article. Any kind of coloured embroidery could be substituted for the silk needlework under glass in the example illustrated in Fig. 10. A sampler or a group of conventional trees and figures in multi-coloured cross-stitch, a wreath or basket of flowers in tapestry needlework are all effective. A tray cloth in real lace may be mounted on silk to tone with the tea ware. Pen painting and pokerwork, tarso and pencil painting are all art crafts which may be utilized and are quite serviceable when frame and glazed in this manner.

Special deep-sided trays are made for carrying bottles, or decanters with a number of glasses. These trays are provided with movable, raised frames having cut out sections in which the glasses, etc., stand. They are specially useful for carrying drinks into the garden. Other trays are fitted with china or



Tray. Figs. 1-6. Showing the construction of a tray from the parts supplied, which are ready for assembling. Fig. 5. Section of a tray consisting of moulding screwed to a base, also a section made with cabinet makers' moulding. Fig. 6. Oak framed tray. Fig. 7. Selection of tray mouldings. Fig. 8. Tray handles of various kinds.

applied, and then the mould can be placed on the edges, the mitres being carefully planed upon a mitre planing board in order to obtain a clean joint.

The usual handle for this type of tray is seen in the section at Fig. 5. A few other patterns are illustrated in Fig. 8. It is screwed directly to the outside of the moulding, or the plates



Tray. Fig. 9. Simple form of decoration with inlay of different coloured woods.

can be let into the wood if desired. It should be sufficient to glue the mitre joints and screw the base to the moulding, but a nail can be driven in at the ends to give further security. A number of tray mouldings are shown in Fig. 7. The uppermost is for screwing direct to the base, the next being a grooved section and the third a rebated one. The bottom moulding is for use with metal corners as shown in Figs. 1 to 4.

A varied assortment of mouldings can generally be obtained at the shops which specialize in woodworking materials. As will be gathered from the illustration here given, there are various methods of fitting the base of the tray.

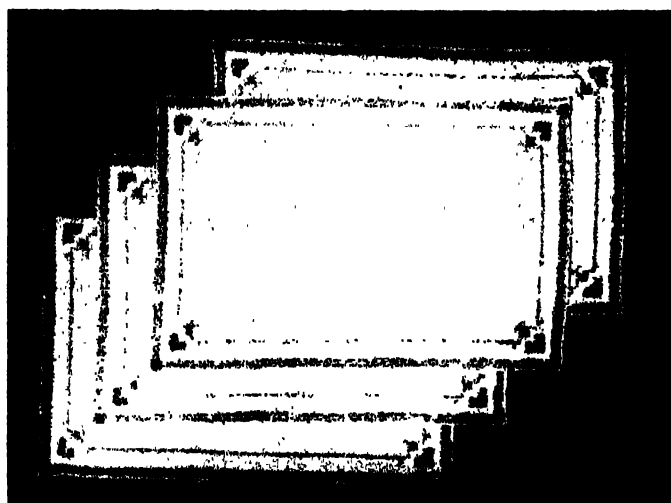
In the tray shown at Fig. 9 the sides should be from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick, according to the dimensions of the base, but a tray measuring about 18 in. by 12 in. will not require a greater thickness than $\frac{1}{2}$ in. and a height of $1\frac{1}{2}$ in. on the long sides. The ends should be about 3 in. high, shaped to an even curve, and the handle opening out to about 1 in. long and $1\frac{1}{2}$ in. deep. The neatest method of joining the corners is by the dovetail joint illustrated in the diagram.

A simple form of inlay decoration is illustrated, consisting of four small squares each of a different coloured wood, arranged in the form of a square. These may be joined with a length of stringing, but the effect of the corner decoration is quite pleasing. The small squares should be cut from wood planed to $\frac{1}{4}$ in. thick and from $\frac{1}{2}$ in. to 1 in. side, according to the size of the tray. The holes are marked out in pencil and recessed with a sharp chisel, giving the edges a slight undercut so that the inlays will fit tightly in the recess.

Fig. 10 illustrates a tray made up with oak moulding and a wooden bottom, over which is placed a piece of embroidery, the latter protected by a sheet of glass. In constructing this type of tray the greatest care must be taken to ensure that the glass lies flat and that the groove or rebate in the moulding does not "bind" the edges at any part.

The home worker who can manage a little simple basket work may like to construct the useful bed tray shown in Fig. 11. It has a wooden bottom which might be lacquered, or stained and varnished. The table portion should be made up first, the top fixed, and the basket-work guard then attached to the latter. A development of this idea is illustrated in Fig. 12, consisting of an invalid's work-table and "breakfast-in-bed" tray. The adjustable sloping work table is of wood covered in baize. The removable tray shown beneath is used to catch and carry the meals, and rests on the table, the latter, of course, being adjusted to the horizontal position.

Trays are also used in travelling trunks, drawers, tool chests, etc. In the case of trunks they are usually made with wooden sides to fit inside the trunk and rest on fillets. The bottom is formed with webbing, which is



Tray Cloth. Set of linen tray cloth, which may also be used as table mat, decorated with drawn thread work.

stretched from side to side and end to end, and covered with canvas or other material and in large trays with one or more wooden strips nailed across from side to side to strengthen the bottom.

Trays for drawers and tool chests are made from thin wood resting on fillets which form runners. They can be divided into compartments, and are useful for storing small articles, or, when used in drawers, to avoid crushing delicate materials. Trays are made of wire for confectionery and letters and of vulcanite for photographic work.

TRAY CLOTH. Small cloths of washable materials made to fit round, square, oval or oblong trays are provided either as protective mats or to enhance the appearance of a tray. They are also needed when a meal is served on a tray. Besides their nominal use they make covers for small dressing tables, and chests, and are often preferred on the afternoon tea-table to a larger cloth, especially when embroidered on linen to match a cosy cover. Sets of tray cloths are also most convenient as place mats for the dinner table.

The housewife can hardly have too many of these charming little cloths, which are so easily made and laundered at home. They may be of brightly coloured linen, embroidered and scalloped with white embroidery cotton, of unbleached linen worked in colours, and with hemstitched edges, or crash with amusing designs in woolwork, or of finest white linen, lace trimmed, or decorated with beautiful Rucheau, Renaissance, or drawn thread work. They may also be made entirely of net, or cricket lace, of oil baize or raffia cloth.

Linen is the most useful material for tray cloths intended for ordinary household purposes. The set illustrated is made in coral pink linen with a border design of drawn thread work. Usual sizes, unless made especially to fit a tray, are an oblong measuring 12 in. by 17 in. or one measuring 15 in. by 20 in. Transfer designs are obtainable in great variety and to fit different shapes and sizes. Scalloped edges are used for oval and

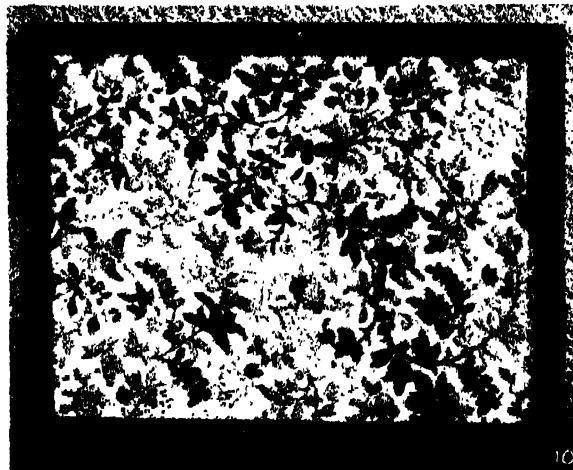
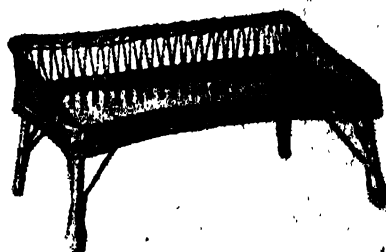


Fig. 10.



Trays. Fig. 10. Pretty little bed tray made from a piece of embroidery, backed, stained and glazed. Fig. 11. Breakfast-in-bed tray of wood, with wicker surround and legs. Fig. 12. Well planned table tray for invalid, with adjustable baize-covered wooden centre and side panniers of wicker for books and work. The tray shown underneath is used in conjunction with the table portion for meals.

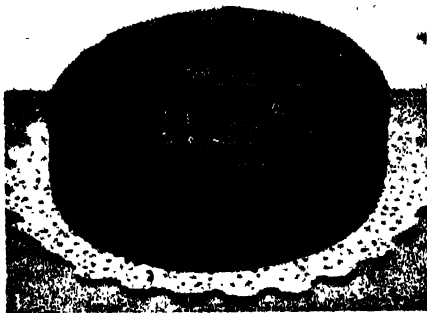
Fig. 12 by courtesy of London Association for the Blind

round tray cloths. See Drawn Thread Work; Embroidery; Hemstitch; Pattern Printing; Raffia Work; Scallopings.

TREACLE. The uncrystallized syrup that drains from raw sugar in the process of refining, and is known as treacle, contains a large proportion of saccharine principle, and is valuable as an article of household diet. It is cheaper than sugar for many purposes.

The uses of this syrup in cookery are manifold. It is used in making all kinds of ginger cakes, gingerbread, and brandy snaps. It is often added to the pickle employed for curing hams and spiced beef. The finer variety of syrup known as golden syrup is usually employed for making roly-poly puddings or treacle tarts, but the pure brown treacle will be found superior to a highly refined syrup for most puddings or for cakes. The very darkest form of syrup, called black treacle, is not suitable for table use.

Treacle Fruit Cake. Golden syrup or treacle is used to mix this fruit cake, which is made according to the following directions:



Treacle Fruit Cake. A wholesome cake for nursery tea.

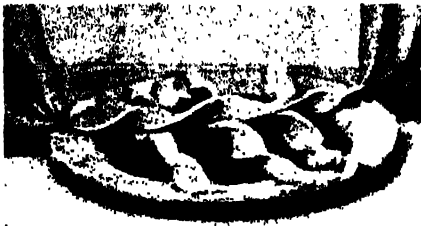
Wash 6 oz. each currants and sultanas, wipe them in a clean cloth, and put them aside to dry. In the meantime, sieve together 1 lb. flour and $\frac{1}{2}$ flat teaspoonful carbonate of soda; rub in $\frac{1}{2}$ lb. margarine until the mixture resembles fine breadcrumbs.

Add the fruit, previously stalked, and 2 oz. candied peel cut into small pieces, mixing all these ingredients well. Break 2 eggs into a small basin, whisk them well, then add $\frac{1}{2}$ lb. syrup or treacle, and continue whisking. Dissolve $\frac{1}{2}$ lb. sugar in 1 gill milk, add these to the eggs, and when they are thoroughly mixed pour them into the dry ingredients and beat the mixture for a few minutes before turning into a large, round cake-tin previously greased and lined with greased paper.

Bake the cake in a moderately hot oven for about 2 hours, lessening the heat after the first 20 min. If it becomes brown on top before it is thoroughly cooked, cover it with a piece of paper. When ready, lift it out of the oven on to a cake-sieve and leave it to cool.

Treacle Pudding. Mix together 6 oz. flour, a little more than 2 oz. finely chopped suet, $\frac{1}{2}$ teaspoonful ground ginger, a pinch of salt, and 1 saltspoonful bicarbonate of soda. Then add an egg, $1\frac{1}{2}$ oz. treacle, and enough milk to mix the whole to a soft consistency. Turn it into a greased basin, cover it with a piece of greased paper, and steam it for about 2 hours. Serve it with heated golden syrup or golden sauce (q.v.).

Another variety of treacle pudding is made by sifting $\frac{1}{2}$ lb. flour with $\frac{1}{2}$ teaspoonful salt into a basin, adding $\frac{1}{2}$ lb. finely chopped suet, $\frac{1}{2}$ lb. raisins stoned and cut small, or $\frac{1}{2}$ lb. raisins and an equal amount of cleaned and picked currants. Stir together 3 tablespoonfuls treacle with $\frac{1}{2}$ pint cold water, and with this mix the dry ingredients in the basin to a dough. Grease a pudding basin, turn the mixture into it, cover with a cloth, and boil for 4 hours. Serve with sweet or golden sauce.



Treacle Tart, a cheap and attractive sweet.

For Palmeston pudding, another form of treacle pudding, equal quantities of breadcrumbs, suet, and treacle are required. The pudding is boiled in a greased basin covered closely with a cloth for about 3 hours.

Treacle Roly Poly. This is made in the same way as jam roly poly (q.v.) and $\frac{1}{2}$ lb. treacle or golden syrup is required. This should be mixed with 3 oz. breadcrumbs and $1\frac{1}{2}$ teaspoonfuls lemon juice, being first warmed in a pan if the weather is cold. Golden sauce should be served with it separately.

Treacle Tart. Some short crust pastry, $\frac{1}{2}$ lb. golden syrup or treacle, 2 tablespoonfuls fine breadcrumbs, and $\frac{1}{2}$ teaspoonful ground ginger are needed to make a treacle tart. Roll out the pastry to a round about $\frac{1}{4}$ in. in thickness, use some of it to line a round greased tart-tin, and decorate the edges with a fork. Mix the breadcrumbs with the ground ginger, add to these the treacle, previously warmed, and pour the whole into the lined tin.

Roll out the remainder of the pastry, cut it into strips about $\frac{1}{4}$ in. wide, twist each of these two or three times, and then lay them across the tart so that they form a trellis-like pattern, as shown. Bake the tart in a hot oven for 20 min., and then turn it out of the tin. It may be served hot or cold. See Golden Pudding; Pastry; Suet Crust; Toffee.

TREADLE. Used in foot-driven sewing machines, fretsaws, lathes, and other small machines, for propelling a fly-wheel, the treadle or foot-motor is a hinged plate fixed to a base or to the framework of the machine and attached to the fly-wheel by a connecting-rod known as a pitman.

The treadle is balanced on a spindle to give an up-and-down movement to the pitman, and is variously shaped from a single foot rest of the portable treadle here illustrated, the double foot rest fitted to some makes of sewing machine, to the heavy bars and pierced iron plate of the lathe. The portable treadle driving wheel is useful in the amateur's workshop for driving a polishing head, a small circular saw or drilling machine, but it must be securely screwed or bolted on the floor.

Inconvenience is often caused when using a treadle by the flywheel stopping



Treadle. Portable treadle with a single foot rest. Courtesy of R. M. H. H. Ltd.

at dead centre. It is not experienced to any extent with a light machine but generally with a lathe fitted with a heavy fly-wheel. The best method of overcoming the dead centre on the crank and so bringing the treadle into the correct position for starting when the machine is at rest is to clamp a weight on the fly wheel so that when the machine is at a standstill, the treadle up, and the crank just over the top centre, the weight is at the bottom of the wheel. A sharp downward push on the treadle will send the crank over the bottom centre, and the impetus given will carry the wheel round. See Fretwork; Lathe; Sewing Machine.

TREE: For the Garden. Trees should never be planted close to a house. Not only when fully grown do they hinder the free



Tree Carnation. Blooms of the variety Enchantress, a beautiful greenhouse carnation. See below.

passage of light and air, as well as inducing dampness, but their presence is a menace to the structure of the building itself.

As a rule, the roots of a tree spread just as far underground as the radius of the branches above. In the course of time, therefore, this spread of roots is quite likely to undermine the foundation of a house, and to render it unsafe. Oaks and yews are the least desirable trees to have near houses.

Some of the most attractive trees for planting in the garden are various Conifers; for example, cypress, deodar cedar, spruce and silver fir; hawthorn, laburnum, catalpa or Indian bean tree, bronze-leaved plum (*Prunus pissardi*), ornamental crab (*Pyrus floribunda* and others), ornamental cherry, scarlet oak (*Quercus coccinea*), variegated maple (*Acer negundo variegatum*), and green and variegated hollies. See Apple; Fruit; Grafting; Hazel; Laurel; Rose; Sycamore, etc.

TREE CARNATION. This name was used to distinguish the original type of winter and spring-flowering carnations grown under glass, a type which has been to some extent superseded by the perpetual-flowering carnations. They need a minimum temperature of about 50 degrees, and are propagated by cuttings inserted in sand beneath a propagating case in the greenhouse. A few of the finest varieties are Spectrum, red; Laddie, salmon; White Pearl, white; Topsy, crimson; and Enchantress, light pink. See Carnation.

TREE LUPIN. This vigorous hardy shrub grows quickly and soon forms a large spreading bush 1 ft. or more high. It needs plenty of room and is scarcely to be recommended for

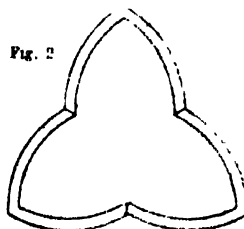
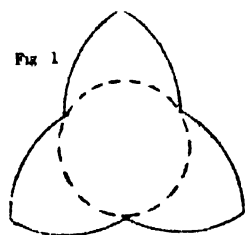


Tree Lupin. A profusely blooming clump of the early summer flowering plant

small gardens. The flowers of the typical kind (*Lupinus arboreus*) are pale yellow and fragrant; they are produced very freely in May and June. Somerset is an improved yellow variety. The variety Snow Queen has white flowers. These plants thrive best in well-drained soil and dislike being disturbed; they are easily propagated by seeds sown out of doors in spring. Straggling shoots should be cut back in March.

TREE OF HEAVEN. This is the popular name of a hardy leaf-losing Chinese tree (*Ailanthus glandulosa*) which will reach a height of 50 ft. or more. It is valued for its long pinnate leaves and red fruits in autumn. This tree, when young, is often hard pruned each spring and restricted to one new stem, for under this treatment the leaves are exceptionally fine, though its height does not then exceed 5 ft. It does well in town gardens and flourishes in ordinary soil. Propagation is by suckers in spring, by layering in summer or by sowing seeds.

TREE PEONY. This shrub (*Paeonia moutan*) bears immense double or single flowers in spring. It is scarcely suitable for general planting, for it starts into growth early and the young shoots are liable to be damaged by late frost. It needs loamy soil and a position in which the morning sun will not reach it. It is a Japanese shrub and the numerous varieties have chiefly Japanese names. *Paeonia lutea* is a handsome tree peony from China and hybrids have been raised between this and the common tree peony.



Trefoil. Fig. 1. Simplest form of this Gothic architectural ornament. Fig. 2. Pointed form seen in stonework

Fig. 2. There is another form taken from the clover leaf in Gothic carving. It may be used with good effect in relief carving and is one of the most suitable motifs for the amateur woodcarver. See Quatrefoil.

TRELLIS AND TRELLIS WORK

Structures for Screening and Beautifying the Garden

A number of articles in our Encyclopedia have reference to one or other of the uses of this form of woodwork for instance Arch; Fence; Garden; Pergola. Porch. Roof Garden. Rose Garden. See also Rustic Work; Summer House.

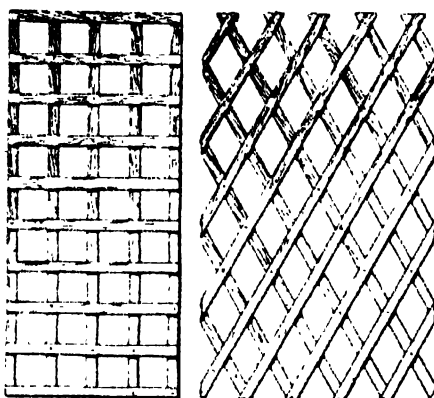
As an ornamental support for flowering plants trellis work is much akin to lattice and rustic work, although the latter term is generally applied to the construction of articles of rough, natural material.

As a rule trellis work is carried out with relatively thin prepared timber, in which sawn plasterer's laths play an important part, but the term is often applied to work carried out with wood in its natural state. The work consists essentially of interlacing, either at right angles or diagonally, thin strips of wood, which are fixed to some form of support or

joint is obtained, affording the necessary strength and rigidity. The top rail, which is bevelled on both edges, runs through the whole length as in Fig. 3, the middle or intermediate uprights being jointed into it as in Fig. 4, and the end uprights as in Fig. 5. It should be noted that the end uprights are grooved on one edge only. Fig. 6 shows the details of the jointing of the centre rails, which are also bevelled on both edges, and are further rebated on one of the lower edges to take the matchboarding. The lower rail is also rebated on the upper edge as in Fig. 7, and is jointed to the end upright as there shown; the intermediate uprights are tenoned into it, mortises being cut for this purpose. These latter should be carefully measured off and marked out in accordance with the length of the centre rails so that the uprights are perfectly vertical when they are fitted in position.

The trellis work may be composed of plasterer's laths, or a quantity of narrow, thin stuff may be obtained for the purpose. Whichever is used, it should be obtained in conjunction with the timber for the framework, since the trellis fits into the grooves in the framework. The width of the grooves equals double the thickness of the laths, since one series of the latter is placed flat on the other. It is not always necessary to nail every joint where the laths cross, especially where a very close mesh is required, each alternate joint being usually sufficient. The matchboarding is secured after the main framework has been erected by nailing. After the whole is in position, it may be coated over with one of the various preservative stains.

An oak trellis is shown in Fig. 8, suitable for erection at a boundary or in place of a solid wall. It is supported at intermediate



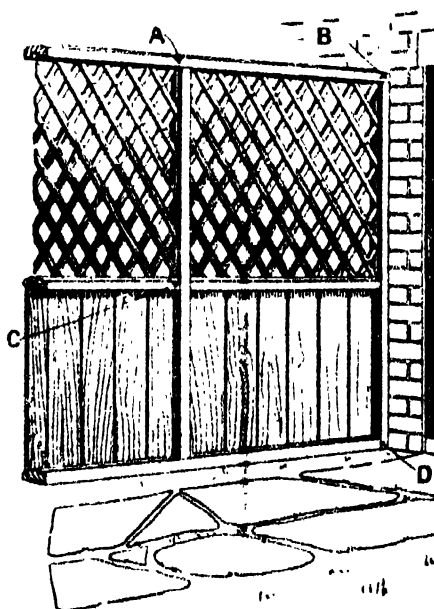
Trellis, Figs. 1 and 2. Two methods of fixing the laths in one they cross at right angles, in the other diagonally

rough grounds. In some cases the strips are not actually interlaced, but are placed so that they cross over one another either at right angles or diagonally, and the appearance of interlacing is obtained.

A general idea of the method of fixing the laths is given in Figs. 1 and 2, where they cross at right angles and diagonally. The joint where they cross is completed by driving a small nail through it and clenching it. The end should be fixed to some supporting framework. The common expanding diagonal trellis can be obtained so cheaply that it is only when some more robust and permanent form is desired that the worker will be called upon to make up this type.

Fig. 3 shows trellis work in prepared timber, which is very suitable when its purpose is to act as a screen rather than purely as a support for plants. The framework has grooves worked on the inner edges in which the trellis is fitted. The latters are carried down to just below half the total height, and the lower portion is filled in with matchboarding. The framework, which is made from specially prepared timber, is jointed together by stub tenons cut in length to just the depth of the grooves, the joint being strengthened with nails.

The length and height of the whole should be first decided upon, and a decision made as to the number of intermediate uprights that will be required. The various lengths are then cut off, always allowing for the tenons. The latter are marked out, using a square to get them true, and sawn with a tenon saw. The thickness of the tenons may be obtained from the grooves into which they fit, and it is advisable to cut them rather full so that a tight



Trellis, Fig. 3. Type of trellis work composed of prepared timber which will be found exceedingly useful for the purpose of providing a screen. The lettering refers to details of joints given in Figs. 4 to 7

distances by brick pillars. The horizontal members are alternately placed on the outer and inner sides of the uprights, and the lower rail is supported by short uprights built into the top of the brickwork. The whole is toned down to a dark colour, and when covered with climbing plants forms a very effective screen.

The trellis in Fig 9 is erected against the sides of a house, for the purposes of training creepers. It is built up in set designs with a border and is secured to a groundwork of battens applied to the walls. The porch on the right is of prepared timber, mortised together, roofed in at the top with timber and covered with one of the patent roofing materials. A fairly heavy moulding is mitred round at the top, the trellis built up in sections and afterwards secured to the whole. When deciding upon trellis to be made up in sections and applied to a wall, careful measurements should be made for the position of windows, doors, drain pipes and the like, and allowance made for them, also for the rough grounds to which they are to be fixed, since this materially enlarges the length required for the trellis. A method of fixing the grounds is shown in Fig 10, which illustrates the use of a spacing gauge

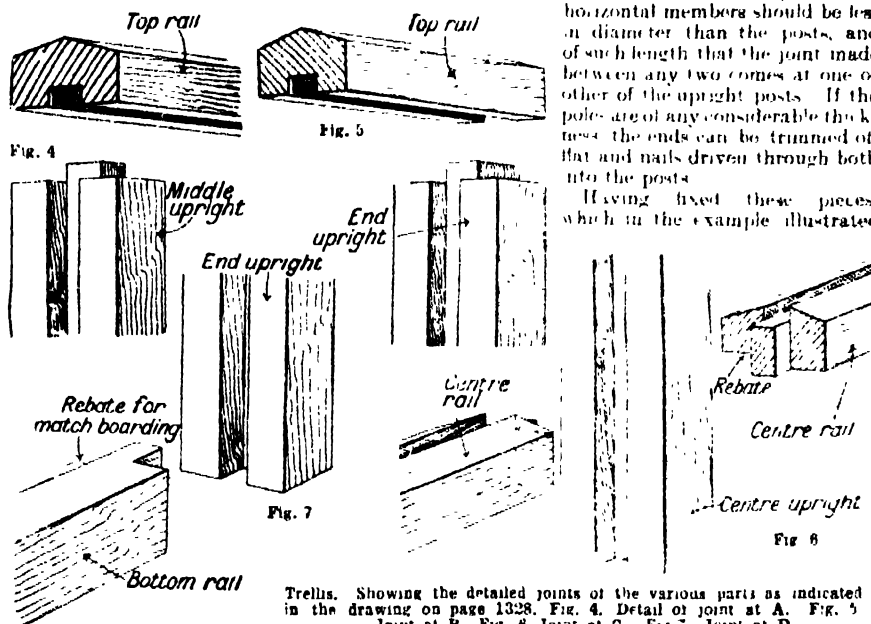
Rustic Trellis. The trellis made of laths has many applications as a screen, but natural appearance given by rustic construction is very pleasing, and a rustic trellis is often more in harmony with the garden and its surroundings. A complete trellis is shown in Fig. 11, stages in its construction being illustrated in Figs. 12 and 13.

Having obtained suitable and sufficient material, the first step is to mark out the position in which it is required to place the "screen." This can be done in the ordinary way with a line and a few pegs, marking out the

positions of the supporting posts. The next stage is to prepare the posts to the requisite height, this depending upon the nature of the surround and the plants to be trained thereon. If such plants as climber roses are to be

into the ground. After the posts have been erected in position and well rammed and consolidated the positions of the horizontal members are decided upon, and these are placed in position and nailed to the posts. The horizontal members should be less in diameter than the posts, and of such length that the joint made between any two comes at one or other of the upright posts. If the pole are of any considerable thickness the ends can be trimmed off flat and nails driven through both into the posts.

Having fixed these pieces which in the example illustrated



trained over the screen, the posts may be anything up to 8 ft. or 9 ft. in height, and the screen illustrated has been constructed on this assumption. It is a good plan to treat the bottom of the posts with either tar or creosote. The posts should be sunk from 18 in. to 2 ft.

are located one along the top of the posts and the other about 3 ft above the ground; the principal cross pieces are placed in position and fixed to the posts or horizontal members with stone wire nails. This operation is illustrated in Fig. 1. These



Trellis. Fig. 9. Type of rectangular trellis carried out in oak. Fig. 9. Example of trellis work applied to the walls of a house, the porch being designed in the same medium to harmonize. Fig. 10. Use of spacing gauge, fixing the horizontal strip to vertical. Fig. 11. An example of a completed rustic trellis forming an excellent support for rambling roses, etc. Fig. 12. Fixing principal diagonal members. Fig. 13. Fixing lighter diagonals into trellis screen.

cross pieces may either be fixed in their natural round shape or flattened on one side.

The spaces between the main cross members are filled in with lighter material in much the same way, fixing these in an X fashion and, if possible interlacing them one over the other until the required degree of closeness is obtained (Fig. 131).

TRELLIS: In Needlework. This filling stitch is used to cover large spaces in embroidery on linen and is worked on counted threads of the fabric. It consists of horizontal and perpendicular lines of working threads held down by a cross stitch where the lines meet. In some designs a small running stitch crosses the junction of the lines. Two other filling stitches with spaced working threads set diagonally are illustrated in page 674, Figs. 4, 5.

The threads of the ground material should be counted both ways, so that they are set evenly apart. If the small stitches which form the first half of the crosses are worked in one direction in one long row, and in the reverse direction on the return journey, all the crosses will be worked in the same way and give a more even effect.

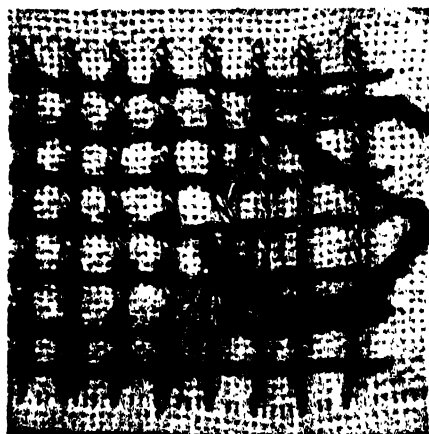
The illustration shows the needle in the correct position, working downward and forming the cross stitch at the junction of two lines. See Cross Stitch, Embroidery, Laid Work.

TRENCHING. This is the best method of cultivating garden ground; it ensures the finest possible flowers and vegetables. Those who grow for exhibition trench the ground three spits (about 30 inches) deep, for ordinary purposes it is sufficient to trench two spits (about 20 in.) deep. If the land has been in cultivation for some years the upper soil may be brought to the surface and the surface soil buried. When trenching new ground, however, the layers of soil must be kept in the same respective positions.

When trenching cultivated land the first thing to do is to dig out the soil two spits deep and 2 ft. wide; the excavated soil is placed near the other end of the plot. The bottom of the hole is forked over and leafy garden rubbish is mixed in. The next top layer of soil is transferred to the first trench and the next second layer on top of that. Thus the first trench is filled and the second is emptied. Each trench is dealt with in the same way, the last trench being filled with the soil first taken out.

In trenching new land the turf should be stripped off and stacked for a year. The first trench is dug two spits deep and 2 ft.

wide and the top layer of soil is also taken off the next strip, both lots being placed at the other end of the plot. The second layer of soil from the second strip of ground is put in the first trench and the top soil from the third strip of ground is placed on top of it.



Trellis in needlework. Method of making this stitch, useful for covering large spaces.

Thus the first trench is filled and the layers of soil remain in the same respective positions. Farmyard manure or hop manure should be mixed with the second layer of soil when trenching both new and old land. When trenching is finished new land must be limed, using one bushel to three rods. The line should be turned in with the garden fork. The best time for trenching is in autumn and winter. See Celery; Digging; Spade.

TRESPASS. There are three kinds of trespass in law, namely, trespass to land, to goods, and to the person. The last of these is more usually called assault. Trespass to goods consists of any actual taking of or a direct and immediate injury to another's goods or chattels. For instance, it is equally trespass if A rides away with B's horse or hits the animal and causes it to run away. If A throws a stone and hits B's head it is trespass.

Remedies for Trespass. The remedy for trespass to goods is by an action for damages. The damages recoverable are, where the goods are taken away altogether, the value of the goods; and where they are merely injured, then the amount of the damage done to them. An action for trespass to goods will not lie unless the plaintiff had the goods in his possession at the time of the trespass.

It is, however, trespass to land that is usually spoken of as trespass. This is committed where anybody, whether wilfully or otherwise, goes upon the land of another without his permission. The word land includes houses and other buildings. This offence, like trespass to goods, is an interference with possession rather than with ownership, so that the tenant of a house or land can bring the action.

The remedy is an action for damages, and these damages

are by no means limited to the actual pecuniary loss sustained by the occupier of the land or house. Thus, very heavy damages have been awarded against a trespasser who walked into another man's ground and paraded up and down in front of his windows, into which he stared in an offensive manner. In the same way, when a money-lender has seized furniture under a bill of sale, and has wrongfully kept a bailiff in possession for several days, he has been made to pay very heavy damages, and this although the bill of sale was only void on a technicality.

Besides actions at law, the householder or landowner has the right to protect himself against a trespasser by turning him out, provided that he only uses as much force as is necessary, and no more. He should first be requested quite civilly to go out.

Trespass is not generally a crime, in spite of the common notice that "trespassers will be prosecuted." It is, however, an offence to trespass on to land belonging to a railway company or on to any land if damage is done to the land, or in pursuit of game. It is also an offence to drive a motor vehicle on to private land or on to a common.

Trespass by Animals. The owner of tame animals is liable to an action of trespass if he allows them to escape on to the land of his neighbour, unless the neighbour was under some duty to maintain a fence and failed to do so, whereby the cattle, etc., were able to stray upon his land. This does not apply to dogs or cats. If cattle are being driven along the highway, their owner is not liable for any damage they may do or for trespass at all if, without any negligence on his part, they stray upon unfenced land.

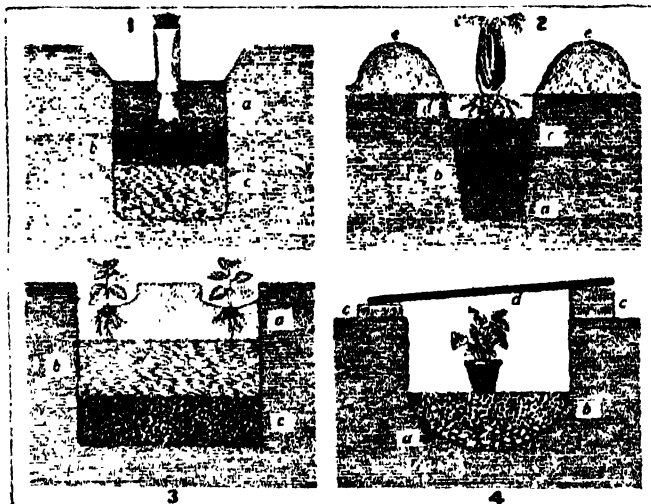
Anyone who takes upon his own land something which is liable to cause injury if it escapes, must pay damages if the dangerous thing does escape and goes upon the land of a neighbour, and this whether there was negligence or not. The best-known case was where the defendant constructed a reservoir upon his land and it cracked and the water escaped and flooded the workings of an adjoining mine. The owner of the reservoir was held liable, although it was no fault of his that the reservoir gave way. A trespasser must take the land as he finds it and will have no remedy if he injures himself by falling into a pit or quarry.

Man Traps, etc. Even a trespasser is entitled to be protected against man traps, spring guns, or other engines calculated to do bodily harm or to destroy life. Anybody who sets such a device on his land with intent that it shall destroy or inflict bodily harm upon a person coming in contact with it, is guilty of a criminal offence, and is liable to a maximum of two years' imprisonment. It is equally an offence to leave such an engine in position if it has been set by a previous occupier. An innocent party injured by such a device would be entitled to claim damages from the person who set it.

The householder is, however, entitled to protect his dwelling house by setting a man trap, spring gun, or other engine between sunset and sunrise. Nor is there any law to prevent him setting traps for vermin, and a trespasser who walks into a rat trap has no remedy if he is hurt.

TRESTLE. In building operations and redecorating, the trestles mostly used take the form of a self-supporting pair of steps. They are most usually employed in pairs, placed at a convenient distance apart, generally from 6 to 8 ft. apart. Scaffold planks or other strong boards are rested upon the treads of the trestles to form a platform.

A strong trestle of another type which is useful for such purposes as the support of a wash tub is illustrated in the following page.



Trenching in the garden. 1. Loek trenching: a, fine soil; b, old manure; c, fresh manure. 2. Celery trenching: a, broken bottom soil; b, manure; c, leaves and soil; d, fine soil; e, soil for earthing. 3. Trench for beans or peas: a, fine soil; b, vegetable refuse; c, manure. 4. Shelter trenching: a, stones; b, ashes; c, bricks; d, cover. By special arrangement with Amateur Gardening.



Trestle. Example of a strong trestle suitable for domestic use

It is substantially built from stout timbers, the top about 9 in. wide and 2½ in. thick, the legs about 4 in. wide and 2 in. thick, the cross pieces 3 in. wide and 2 in. thick, the whole being securely halved and screwed together. It will be noted that the legs splay in two different directions spreading outwards like the letter A. When viewed from the side and from the front they incline outward from the top part, this being done to give greater stability. A pair of light hinged trestles is used to support a table such as that described in the succeeding article. See Scaffold ing, Steps.

TRESTLE TABLE. There are many uses in the ordinary home for a table supported on a pair of trestles such as that illustrated in Fig. 1. It may serve for the support of a table tennis table, and may also be used as an emergency table at Christmas or other times. To the amateur constructor it affords a temporary support for work, and when papering a room it is most useful as a pasting board.

A complete set of the components required for the trestles is illustrated in Fig. 2, which also gives the leading dimensions. The legs are of deal or other tough wood measuring 2 in. wide and 1 in. thick. The crossbars are of similar material, but those on the top should be 2 in. deep and 1½ in. thick. The crossbars can be doweled and screwed to the legs, which are glued and screwed into notches or housings cut in the top bar.

When the timber has been prepared to the correct length and size, planing it up on all four sides, the positions for the crossbars at the lower part of the leg are marked out. It will be noticed that the legs of the trestles are splayed in order to afford stability. In addition, considerable care must be taken so as to get the notches in the

top pieces cut at the proper angle, and the ends of the crossbars also must meet the legs at a similar angle.

One of the side pieces and a crossbar are grasped in the vice in the manner illustrated in Fig. 3, at the proper angle and both of them are drilled through with a brace and bit as shown. A dowel pin is driven temporarily through this hole and a second drilled about 1 in. from it. All the dowel joints are prepared in the same way and are assembled by inserting the dowels into the side pieces, placing the crossbar against them, and after coating the joint faces with hot glue they may be cramped up until set.

The top pieces are prepared and notches cut in them, so that the legs can be fitted. The legs should fit very closely against the shoulders of the slot in the top bar, to add to the stiffness and general stability of the structure. When fitted, they should be glued and screwed in place. After the glue has set hard, any overhanging or projecting portions should be planed off.

The final operation is to hinge together the two members of each trestle with stout butt hinges. This is best accomplished by placing the two top edges together, laying the hinges flat on the upper surface with half on each crossbar. Holes are then drilled and the screws driven home. Two screws should be placed in each hinge as a start and one of the

legs lifted up, as shown in Fig. 4, to see that it folds back properly. Any necessary corrections in the alignment of the hinges should be made, and the remainder of the screws then driven home.

The table top is constructed from a few lengths of tongued and grooved floor board, the outer edges planed up smooth, and the ends and the centre strengthened by cross battens of wood about 1 in. thick and 3 in. or 4 in. broad. To prevent the legs of the trestles from opening too far a stout cord is threaded through holes drilled through the centre of each of the lower crossbars and prevented from pulling out by tying a knot in each end of the cord. The length of both the cords should be equal, to ensure the heights of the two trestles being uniform. See Folding Table, Table.

TRICHOMANES. This is the name of a group of beautiful filmy ferns which are grown in glass cases in a shady greenhouse in an exceptionally moist atmosphere. They should be set in well-drained pots or earthenware pans, in a compost of sandy peat with pieces of sandstone intermixed. Propagation is by spores at any time during the year, or by division of the roots in early spring. On no account should be plants be syringed.

TRICHOPIILIA. The small evergreen orchid called *Trichopilia* flourishes in the



Trestle Table. Fig. 1. Home-made trestles used to support a table top. Fig. 2. Component parts of the trestle, showing dimensions. Fig. 3. Drilling the side bar and cross piece for the dowels. Fig. 4. Joining the parts together by means of hinges

intermediate house. It has flowers of various colours, some of which are slightly fragrant. They grow best in pots or baskets hung from the roof of the greenhouse, in a mixture of peat, sphagnum moss, and charcoal. The necessary average temperature is 50°, rising to 60° during the summer months or growing period. *Trichopilia* is propagated by division of the pseudo-bulbs in early spring, when the plants should be repotted. See Orchid.

TRICYCLE. Chiefly for the use of children, tricycles are also made for adults, of both sexes, who are unable to adapt themselves to the bicycle. The modern type of light tricycle is as easy to propel as a bicycle. A differential axle allows the rear wheels to turn independently at different speeds when going round a bend. The frame is made generally in two sizes, 22 in. and 24 in., and the wheels are usually 26 in. The methods of cleaning and adjustment advised for the bicycle apply to tricycles. *See Bicycle, Tire.*

TRIFLE. A sweet with a basis of sponge-cake, trifle can be made from a variety of ingredients and it is usually named according to the predominant flavour, sherry being one very popular flavouring. Whipped cream, almonds, and other nuts, angelica, crystallized flowers, and glacé fruits are all used in the decoration of trifles.

A good plain trifle can be made by splitting six small sponge cakes, spreading the cut sides with jam, and arranging the lower halves in a glass dish with the cut sides uppermost. Boil up $\frac{1}{2}$ pint milk, soak the cakes in the dish with some of it, put on the top halves and then pour on the remainder of the milk. Prepare some custard with 1 pint milk, 1 tablespoonful custard powder, and 1 oz. castor sugar, flavour it with a few drops of vanilla and let it cool. Then pour it over the cakes, set the whole aside until it is cold, and decorate it with glacé cherries.

Another variety of trifle is made either from a Swiss roll or two jam sandwich cakes. Cut the cake into blocks each about $\frac{1}{2}$ in. thick, heap these on a glass dish, and pour over them 1 pint custard, basting them until they are well soaked. Whisk $\frac{1}{2}$ pint cream until it thickens, stir into it the stiffly whipped whites of 2 eggs, and add sugar and vanilla flavouring.

Heap the mixture all over the soaked cake, decorate the top with a few ratafias, and blanch and shredded almonds. If liked, the quantity of cream may be lessened and the cake may be soaked with fruit syrup flavoured with ratafia before the custard is poured over. *See Banana Trifle; Fruit Trifle; Ratafia.*

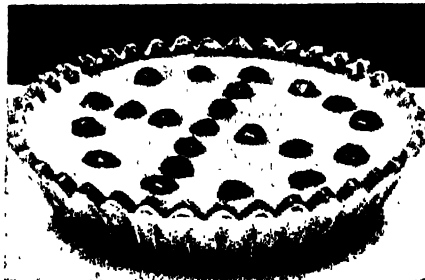
TRILLIUM. This is the botanical name of the wood lily or trinity flower, a charming hardy plant for the rock garden. It bears large, three-petalled flowers in spring. The roots should be planted in autumn in slight shade in soil with which peat and leaf-mould have been mixed. The common wood lily is *Trillium grandiflorum*, 12 in., with beautiful white flowers, sessile, 9 in., has reddish blooms and those of *viride*, 10 in., are white.



Trillium. Various three-petalled flowers of the wood lily (*Trillium nivale*), a low-growing plant for the rock garden.

TRIMMER: For Cutting. One of the most useful tools of this class, for general trimming requiring a keen cutting-edge, is the small pocket implement in which a razor blade is locked. When not in use, it is shut up like a pocket-knife so that the blade edge is shielded. The blade can be changed as often as it becomes blunted.

TRINKET. The word trinket is used to describe a small ornament usually of slight value, as for example the cheaper kinds of



Trifle. Plain variety of this party sweet.

brooches, bangles, fancy pins, and necklaces. A small box suited for holding such articles and to stand on the dressing table is known as a trinket box, but for these there is no conventional pattern.

TRIPE: How to Cook. Tripe is the inner lining of the stomach of the ox or cow. As a food it is tender and easily digested. There are various kinds, named according to the part of the stomach from which they are taken. Honeycomb, blanket, and book tripe are perhaps the best known.

As sold in the shops, tripe is usually partially cooked, but if totally unprepared it needs careful cleaning in three or four different waters and should be left to soak in clean, slightly salted water for two or three hours. It needs long preliminary boiling. As many as 16 hours may be required before the tripe is tender. After cleaning, it should be covered with cold water, brought to the boil, then strained, and more cold water added. This process should be repeated until the tripe has lost its unpleasant smell. It should then be covered again with cold water and cooked until tender. For prepared tripe the process is simpler. The cold water needs to be strained off only once, and two or three hours' slow cooking is usually sufficient. The tripe may then be prepared.

Tripe and Onions.

The most popular method of cooking tripe is to stew it with milk and onions. To do this, boil 2 lb. tripe for two or three hours, adding, after about one hour's cooking, three or four peeled and quartered Spanish onions. When this preliminary cooking is over, cut the tripe into pieces of a convenient size and chop the onions. Melt 2 oz. margarine in a saucepan, thicken it with two tablespoonfuls flour, and when the two are smoothly mixed strain in 2 large breakfastcupfuls of the stock in which the tripe was cooked. Stir the sauce until it boils, add 1 breakfastcupful

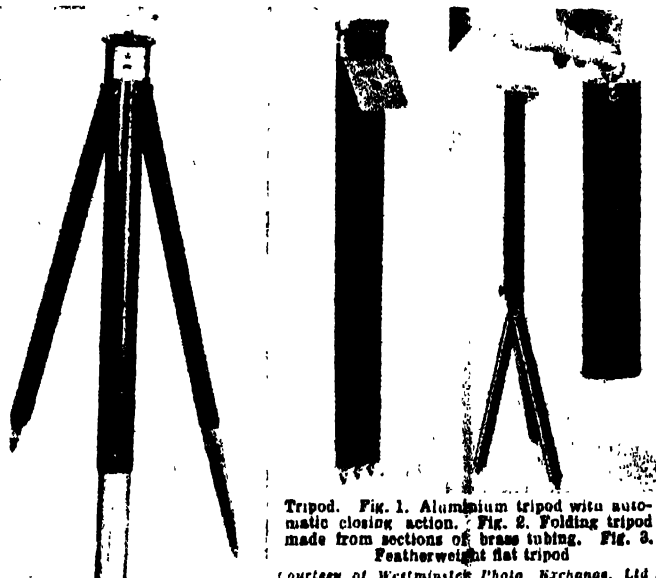
milk, seasoning to taste, and the pieces of tripe and onions, and cook all slowly for about 20 min. Serve the whole on a hot dish.

Casserole of Tripe. Tripe can also be cooked in a casserole. Slice six onions and fry them brown in butter or dripping. Then, having cut the prepared tripe into pieces, put it into the casserole, where the onions have been placed, and add to it 1 pint white wine, one or two carrots cut into small pieces, a teaspoonful each chutney and salt, a few peppercorns, and a bunch of herbs. Shut down the lid very tightly and, if necessary, close the edges with a thin strip of dough so that no steam can escape from the interior. It should then be cooked in a gentle oven for four or five hours. If made the day before, it can be reheated, the fat being first of all skimmed from the surface. It can be served in the casserole, the herbs having been first removed.

Curried Tripe. To serve tripe as a curry, cut $\frac{1}{2}$ lb. prepared tripe into small pieces. Melt $\frac{1}{2}$ oz. margarine in a pan, cook 5 tablespoonfuls minced onion in it, and when it is lightly browned add $\frac{1}{2}$ tablespoonful curry powder and the same quantity of flour. Fry all these ingredients well before pouring in 3 gills white stock and half that quantity of milk. Stir the whole well until it boils, and then add seasoning to taste. Add the tripe to the sauce and cook it slowly until it is heated through. Freshly boiled rice should be served with this dish, either as a garnishing border or handed separately. *See Casserole; Curry.*

TRIPOD: For the Camera. The amateur photographer who attempts anything but snapshots is immediately faced with the question of the kind of tripod to use. There are innumerable varieties on the market, few of which, however, fulfil all the requirements of the ideal tripod.

Such a tripod should be of very light weight and fold up compactly; it should extend to $4\frac{1}{2}$ to 5 ft., and when extended should be rigid and able to support without vibration the

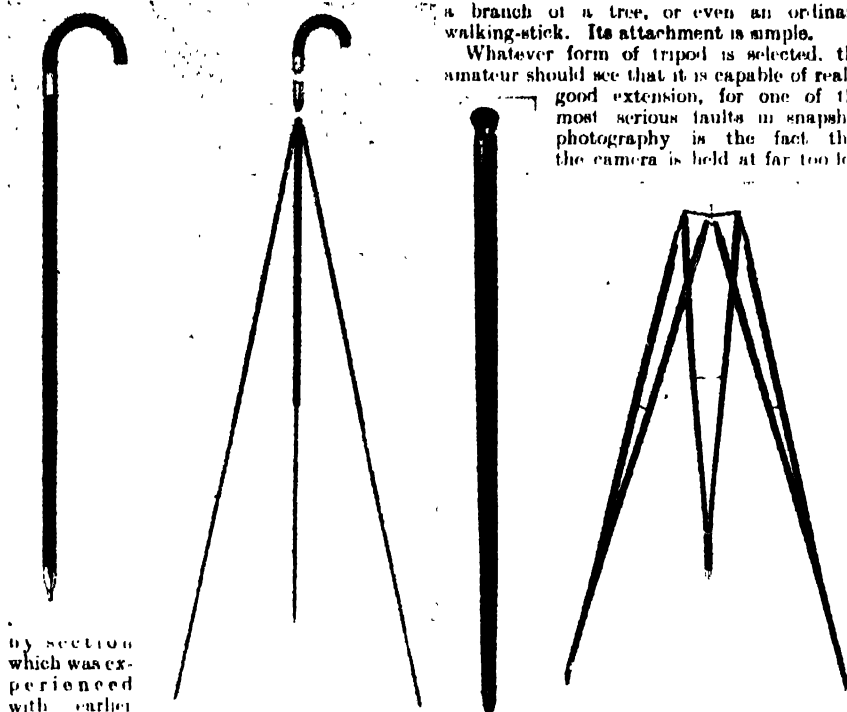


Tripod. Fig. 1. Aluminium tripod with automatic closing action. Fig. 2. Folding tripod made from sections of brass tubing. Fig. 3. Featherweight flat tripod.

Courtesy of Westminster Photo. Exchange, Ltd. and Enghun, Ltd.

weight of a good class $\frac{1}{2}$ -plate camera, using metal slides and glass plates. The old-fashioned folding wooden tripod on which $\frac{1}{2}$ -plate and larger field cameras were supported met none of these requirements except that of rigidity.

The most successful of modern tripods are those made in metal, brass, or aluminium, generally in tubular, telescopic form. A very good example is made in triangular aluminium tubes (Fig. 1). It is extremely light, rigid when open, while its automatic closing action overcomes the tediousness of closing section



by section which was experienced with earlier forms of aluminium tripods. The photograph shows one leg of the tripod

closed up, the right leg with each of the 5 sections pulled out a little, while on the centre leg is shown the small press button, pressure upon which releases the catch and allows all the sections to be thrust home in one movement. This tripod extends to the useful height of 5 ft. when open.

The tripod-using photographer, whether amateur or professional, requires that the burden of photographic apparatus he is to carry about shall be made as convenient as possible. Accordingly, various forms of tripod close into walking sticks and other easily portable forms. An extremely compact form is the Zeiss Ikon (Fig. 2), which has a flat metal plate for the head, on which the camera is very firmly based. It only measures 12 in. when closed, and its sections of brass tubing open to nearly 5 ft. Being made of brass, it is somewhat heavy to carry.

A still more compact camera stand is the Easig Featherweight flat tripod (Fig. 3), which, measuring only 11 in. when closed in its case, extends to 42 in. It provides a folding flat head giving rigid support: its weight is 17 oz.

Ingenuous varieties of tripods which fold up into the form of a walking stick are shown in Figs. 4-7, closed and open. That shown in Figs. 4 and 5 is of metal, the handle and ferrule screwing off top and bottom. The three legs then separate and the extensions are pulled out, as in Fig. 5. The walking stick tripod illustrated in Figs. 6 and 7 is a handsome specimen made in hardwood.

For small hand cameras a device such as the Kodak Optipod or Kodapod, illustrated in page 939, make good substitutes for a tripod when fixed to a fence,

a branch of a tree, or even an ordinary walking-stick. Its attachment is simple.

Whatever form of tripod is selected, the amateur should see that it is capable of really good extension, for one of the most serious faults in snapshot photography is the fact that the camera is held at far too low

Tripod. Figs. 4 and 5. Metal tripod which folds up to form a walking stick. FIG. 6. Ingeniously designed tripod in larchwood, which folds compactly together and forms a walking stick. FIG. 7. Small scale view of the walking stick tripod extended for use

Figs. 4 and 5, Courtesy of Westminster Photographic Exchange, Ltd. Figs. 6 and 7, Courtesy of A. Adams & Sons, Ltd.

a level. The little and nearly useless viewfinder is largely responsible for this fault, and the effect is that 90 per cent of the photographs taken have the view point of a being with eyes in his stomach instead of in his head. If the tripod itself has not sufficient extension, it should either be mounted on a raised object, or an extension rod added to the top.

A useful accessory is the ball-and-socket head, such as that shown in Fig. 8, which can be screwed on to the top of any tripod. This enables all levelling to be done after the tripod is set up. With the ordinary tripod the camera has to be levelled by moving first one leg and then another, and on rough or slippery ground this is apt to be an extremely tedious business. With the ball-and-socket head the tripod can be set up in any position, and the camera is quickly and simply levelled and pointed in the right direction by releasing the screw on the side of the socket, tightening it up again when the correct position is found. Moreover, by means of the slot seen in the side of the socket the camera can be turned completely over on its side so that photographs can be taken in either horizontal or vertical position without the necessity of unscrewing the camera from the tripod head.



Tripod. FIG. 8. Ball-and-socket head to be screwed on top of tripod

When using a tripod indoors on linoleum wood, or stone floors, it will be found that the metal pointed feet have a tendency to slip. This is simply overcome by using a piece of string with four loops tied in it, one at each end and the other two at $\frac{1}{2}$ of the distance from each end. In use the two end loops are slipped over the feet of one of the tripod legs and the other loops over the other two legs. The legs must be firmly strained against the string loops.

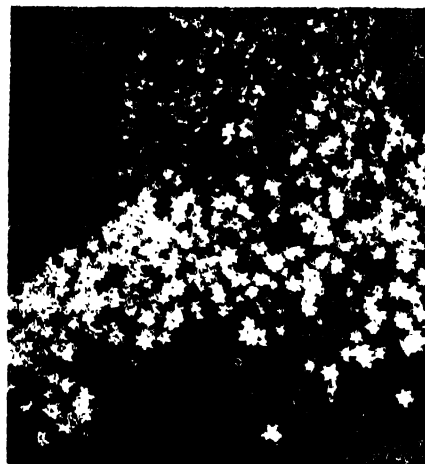
TRITELEIA. Also called spring star flower, this is a hardy bulb which blooms in spring. It will flourish in sunny or shady places in ordinary soil. The chief kind is *Triteleia uniflora*, which grows 6 in. high and bears white flowers, shaded with purplish-blue, in April. It is suitable for the rock garden and for planting in grass among trees. Bulbs may also be potted in autumn and grown in the greenhouse. See illus. below.

TRITONIA. These are hardy bulbs which bear flowers similar to those of the montbretia. They should be planted in autumn in well drained soil in a sunny sheltered border, as for instance at the foot of a house wall where they will flower in early summer. The chief kind is *Tritonia crocata*, of which varieties of brilliant colours have been raised. One of the finest is the orange-yellow Prince of Orange. Other species of *Tritonia* are generally included in *montbretia* (q.v.).

TRIVET. In the ordinary domestic sense a trivet is a movable iron frame either fixed to the bars of a grate or supported on three legs and used for holding the kettle when it is off the fire. Gas and electric fires are sometimes fitted with a trivet attachment for boiling a kettle.

TROLLIUS. This is the botanical name of globe flower, a very showy hardy spring and early summer blooming plant especially suitable for the shady border or for moist soil by the garden pool. The plants grow from 12 to 24 inches high and bear large globe-shaped blooms in various shades of orange and yellow. They should be planted in autumn in deep moist soil. *Trollius europaeus*, lemon yellow and *asiaticus* and *Lachmanni*, golden yellow, are the chief species, but many beautiful varieties have been raised and these are now chiefly grown. A few of the best are Orange Globe, Empire Day and Fire Globe.

TROPAEOLUM. These are hardy or half hardy perennials and annuals, some being of great beauty. The loveliest of all is the Chilean flame flower (*speciosum*), a slender



Triteleia. Charming effect of this white spring star flower at the base of rocks. See article above

twining plant with graceful leaves and bearing a profusion of scarlet flowers in late summer. It attains its greatest beauty in gardens in Scotland and the north of England where the cool moist air suits it perfectly. In southern gardens it must be planted on the north side of a hedge, shrub or trellis in leafy soil, its light green foliage and brilliant flowers look especially well if allowed to trail over holly or other evergreen trees. The stem dies down in autumn. Roots should be planted in spring about 4 in. deep.

The Canary creeper (*Tropaeolum aduncum*) is a popular half hardy climbing plant with

yellow flowers in summer, raised from seeds sown under glass in March, and planted out in May (*see* illus. in p. 182). The common climbing nasturtium is *Tropaeolum majus*. *Tropaeolum polyphyllum* is a hardy perennial of low growth with grey leaves and yellow flowers; it should be planted in a sunny place in the rock garden and given some protection in winter. The scarlet flowered *Lobbianum* is a decorative annual for pots in the greenhouse. *See* Nasturtium.

TROUGH. Intended for holding various kinds of food for animals and poultry, troughs are made of wood, iron, stone, and cement. The simplest form is made of two boards nailed together in the form of a V at an angle of 60° or so with two ends of square wood. It can be used in thin wood for chickens, in thicker wood and to a larger size for rabbits and fowls, and in hardwood for pigs.

The usual type of trough for fowls, ducks, geese and turkeys is made from galvanized iron with wire guards and is obtainable in two sizes, 18 in. long and 6 in. wide and 24 in. long and 7 in. wide. The advantage of the guarded trough lies in the fact that the food cannot be trampled on and therefore it effects a saving of food. *See* Pig.

TROUSER PRESS. This is an appliance for pressing the creases in trousers. Some are provided with an extension to which the trousers are attached for the purpose of stretching as well as pressing them, in order to remove any bugginess at the knees.

Trouser presses are obtainable in several sizes, from those suitable for placing in a suit case to those large and heavy enough to take several pairs of trousers. They are generally made in polished hardwood, with plated fittings.

A press can be constructed without much difficulty. Moulded oak boards could be used for the top of the press, and the base could be made of 1-in. plywood. It might be possible to obtain plated fittings at a second-hand shop. A stretcher attachment can be added if desired.

In use, the press is opened out, the trousers carefully folded and placed on the bottom board, and the top placed in position. The screws nearest the bottoms of the trousers are screwed down first; the top of the trousers is stretched, being held in position by the fingers while the second set of screws is tightened. If the press has a stretching attachment the top is removed and the top bar of the stretcher is folded back. The trousers are placed in position, the top replaced and tightened at the bottom, and the top bar of the stretcher placed over the cloth and screwed down tightly. The projection is folded back underneath the bottom board and the top screws tightened up.

The method is the same when two or more trousers are placed in the press, but pieces of

stout cardboard or thin plywood must be provided to place between each pair. When placing trousers with the permanent turn-up bottom in the press, this portion of the trousers must be left outside, otherwise it is impossible to obtain a long crease.

TROUSSEAU. The trousseau or outfit of a bride is usually supplied by her parents, the amount spent upon it varying according to circumstances.

Fashions change so quickly that the old idea of the outfit which lasted for years has been modified considerably. A trousseau merely contains as adequate and charming a collection of dresses, wraps, underwear and dress accessories for the immediate season as can be afforded.

Extra money which the parents can give for the purpose is more useful in the form of a cheque for later spending than in buying up an excess of clothing which cannot be given reasonable wear before it is old-fashioned.

The girl who is clever at needlework can make delightful additions to her trousseau at small cost. Dainty embroidery and handwork add greatly to the charm of lingerie, and are well worth the time and trouble they demand, as these things are expensive to buy when ready-made in beautiful styles and qualities. Underwear should be marked with the bride's Christian name or initials and her new surname. This marking can be done in ink, or the letters may be embroidered. *See* Wedding.

TROUT. Amongst the various species of trout the river fish is most highly esteemed for its delicate flavour. It is in season from March to September. When buying this fish, care should be taken to select one with bright eyes, red gills, and firm flesh, and it should be cooked as soon as possible after purchase. There are various methods of cooking trout, the larger fish being prepared much in the same manner as salmon.

Baking Trout. Baking is a favourite way of preparing trout. Clean 3 small fish, split them open and take out the bones; then lay them with the skin side uppermost on 3 thin rashers of fat bacon placed at the bottom of a fireproof baking dish. Season them to taste. Sprinkle a little chopped parsley and some lemon-juice over them, cover them with a greased paper, and then bake them in a moderately hot oven for about 20 min.

Frying Trout. To fry trout, clean the fish, split it and remove the bone as directed in the previous recipe, then sprinkle it with seasoned flour, brush it over with beaten egg, and coat it with breadcrumbs. Fry it in a pan of smoking hot fat, and when browned on both sides, drain and lift on to a hot dish. Fried parsley is the most suitable garnish, and mayonnaise sauce can be served separately.

Broiling Trout. Trout can also be broiled. First clean and split open the fish and take out the bone. Season it to taste with salt and cayenne, sprinkle it with lemon juice, and then brush it all over with melted butter or margarine. Broil it before a clear fire for about 8 min., and serve with parsley sauce.

To boil trout, the fish, after cleaning, is put into a pan of boiling water to which a little vinegar and salt have been added. About one teaspoonful each of vinegar and salt are needed to every pint of water. Take the scum from the top as it rises. The time

required for boiling depends upon the size of the fish, one weighing 2 lb. needing about 15 min. When ready, drain it and serve with shrimp sauce. Cut lemon makes a suitable garnish. *See* Fish; Salmon; Sauce.

TROWEL. Various patterns of trowel are used in building by bricklayers and plasterers, and small trowels of a different shape are useful to the gardener. *See* Brick; Casting; Cement; Plaster; Pointing; Rendering; Tool.

TROY WEIGHT. This weight is employed for weighing gold, silver, diamonds, and precious stones generally. It is as follows: 24 grains = 1 pennyweight (dwt.), 20 pennyweights = 1 ounce (oz.), 12 ounces = 1 pound (lb.). The pound troy is not the same as the pound avoirdupois, as it only contains 5,760 grains against 7,000.

TRUFFLE. The truffle is really an edible fungus which is found just below the surface of the ground in wooded districts and in forests on the Continent, some parts of France being famous for truffles. They are also obtained in limited numbers in England, but these are usually found to lack the particular flavour of the continental varieties.

In colour, truffles are red, white, or black. The black ones are the ripest and the most commonly seen, and are used to flavour sauces and stews and also sometimes served as a dish by themselves. They are very expensive, whether bought by the pound or in bottles, and are in season in October, November, December and January.

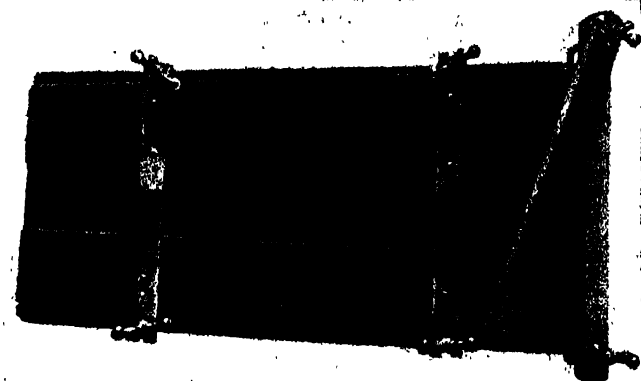
Bottled truffles need no preparation before they are cooked, but fresh ones need to be soaked in cold water for an hour or more to remove any particles of earth that still adhere. They should then be washed in several cold waters, brushed well, dried, and peeled and cut into shapes. The peel may be used for flavouring purposes and should on no account be thrown away.

If served alone, truffles should be left whole, each one wrapped in a piece of buttered paper and then baked for about an hour in a hot oven. They are sometimes stewed in champagne, flavoured with vegetables and herbs. When used as a garnish, truffles are first boiled for about 15 min. They may be cut up either before or after boiling, according to taste.

Truffle Sauce. Clean a dozen truffles, cut them into thin rounds, and then stir them in a frying-pan over the fire, with a lump of butter slightly larger than a hen's egg, 2 dessert-spoonfuls each finely chopped parsley and shallot, and seasoning to taste. After about 10 min. cooking, drain off some of the fat, add a little more fresh butter, $\frac{1}{2}$ gill gravy, the strained juice of $\frac{1}{2}$ a lemon, and a dust of cayenne. Continue stirring the sauce until it boils and then serve it immediately.

TRUG. A convenient type of basket for gathering vegetables and flower sprays is that known as a trug or Sussex trug. It is a wooden arm basket with rounded bottom, and in length is about three times its width. It is largely employed for garden purposes in most country districts.

TRUMPET FLOWER. This vigorous, climbing plant, 18 ft. or more in height, bears tube-shaped flowers in summer. Only two are suitable for cultivation out of doors, and they must be planted against a sunny wall. *Tecoma grandiflora* and *T. radicans*, both with reddish-orange flowers. In mild districts they form admirable wall plants. They should be planted in autumn or spring in deeply-dug soil with which old turf and decayed manure have been mixed. The side shoots should be pruned in spring. For a heated glasshouse two of the best kinds of trumpet flower are *capensis* and *jasminoides*.



Trouser Press. Compact press for several pairs of trousers. It is not too heavy to pack in a travelling trunk.

TRUMPET LILY. This name is usually given to the familiar white-flowered *Lilium longilorum*, often called Easter lily because it is forced into bloom in large numbers for decorative purposes at that season. It is more useful for cultivation in pots under glass than for planting out of doors, where it does not usually flourish for more than one or two seasons. Bulbs should be potted in autumn or winter, singly in 5-in. pots placed in a frost-proof frame or greenhouse, and covered with fibre until they are well rooted. They should then be set in a light position in a heated greenhouse where they will make quick progress. The bulbs must be set low down in the pots to allow of a top-dressing of soil when roots form at the base of the stems. See Lily.

TRUNK. This word is used for a box made to carry luggage. A useful type is that known as the cabin trunk. The essential feature of this is a lack of height, which enables it to be stored away in a cabin. A serviceable size is 36 in. by 20 in., with a height of 12 in., but they are sold in larger and in smaller sizes.

One variety of cabin trunk has a frame of three-ply wood covered with brown canvas. It is strengthened by wooden hoops and is fastened by two locks. A tray that can be lifted out is the only internal fitting. A better type has a fibre foundation and the corners are protected by stout pieces of leather.

Wardrobe trunks are bulky, but their fittings and compartments make them easy to pack and unpack. It is not advisable to buy large trunks in cheap quarters.

No much confusion arises when trunks of similar appearance are unmarked, or when the labels are torn off, that it is always wise for the owner to have his or her initials painted on in a conspicuous place. This will help to avoid loss or delay. See Holiday, Lock, Lost Property, Packing, Suit Case.

TRUSS. By the term truss is generally meant an apparatus usually composed of a leather-covered spring and a pad used in the treatment of hernia or rupture. Its object is to prevent the hernia from slipping out after it has been reduced.

A truss should be worn continuously while the patient is in the upright position. While in bed it may be discarded, unless the patient suffers from a cough. The whole virtue of a truss lies in its being correctly fitted and adjusted. In young children the complete cure of rupture may sometimes be looked for if a correctly fitting truss is worn constantly for two or three years. In children in their teens, and adults up to well past middle life, a complete cure by operation is nearly always preferable to the wearing of a truss. See Piles; Rupture.

TRUSTEE: His Duties. When one person holds property of any kind for the benefit of another or others he is said to be a trustee, and to hold the property upon trust for the beneficiary or beneficiaries, who are also called cestui que trust. A trust may be created by will, deed, or other writing, or even by word of mouth; but it must be evidenced by writing if it relates to land or other hereditaments.

If a trustee dies or becomes incapable of acting or desires to be discharged, refuses or is unfit to act, or remains out of the United Kingdom for more than 12 months, then a new trustee may be appointed. If the instrument creating the trust gives to anybody the power of appointing new trustees, that person makes the appointment; but if there is no such person then the surviving or continuing trustees or trustee or the executor or administrator of the last surviving or continuing trustee appoints the new trustees or trustee.

If there are more than two trustees, and one of them dies or retires, it is not necessary

to appoint another in his place so long as there are two left; but if there are only two, then one cannot retire without another being appointed to replace him. If a trustee misconducts himself, an action may be brought by any beneficiary or co-trustee to have him removed and another trustee appointed.

A trustee should only invest trust money in trustee securities, unless the trust deed or will gives him power to do otherwise. If he invests money on mortgage, he should have the land or houses valued by a competent surveyor, and not lend more than two-thirds of the valuation. A trustee is liable personally for breaches of trust; but he may apply to the court to be protected should he have acted honestly though mistakenly.

A trustee ought not to carry on a business unless the trust deed or will gives him power to do so. Suppose the testator who created the trust left the whole of the property to trustees in trust for his widow and children, and amongst the assets is a business, it is the trustees' duty to realize the business and invest the proceeds in trustee securities, because it is for a trustee to look to safety rather than to high interest. In some cases, however, the will or deed gives trustees wide power of investment, and then they are safe so long as they keep within the four corners of the instrument. If a beneficiary tries to persuade a trustee to make an unauthorized investment, the trustee should always take from him a letter requesting such investment to be made, and giving an indemnity against the consequences.

Trustee Investments. The term trustee stock is used to describe those securities in which, by English law, trustees may invest trust funds. These include public funds and certain corporation stocks, as set out in the Trustee Act, 1925. Examples are: British Government securities; Bank of England stock; Metropolitan stock; Metropolitan Water Board stock; British water companies incorporated by royal charter or special Act of Parliament, where the company has paid 5 per cent. on ordinary stock for the past 10 years; municipal borough or city corporation stock, where the place has a population exceeding 50,000; mortgage of real property up to two-thirds value; any security which is for the time being authorized as a trustee investment by a judge in the high court.

Breaches of Trust. When trust property has been improperly disposed of, the beneficiaries are entitled to follow it as long as it can be traced and identified. If a trustee mixes trust money with his own, as by paying it into his own account at his bank, the beneficiaries are entitled to be paid out of that account in priority to anybody else; because it is always assumed that any money which he drew out for his own purposes was his own money and not trust money, and therefore all that is left is trust money.

Where there are co-trustees, each one is liable to see that the funds are properly taken care of and duly administered. Therefore, a



Trumpet Lily. Fine heads of this fragrant species grown as a pot plant

co-trustee should never allow the other co-trustee to administer the trust without constant checking. It is his duty, if he allows his co-trustee to receive trust money, to take care that it is properly invested or otherwise disposed of at once.

If he is informed that the money has been invested on certain securities, he should demand to see those securities; and he ought to take care that all trustees' securities, such as mortgages and stock certificates, are made out in the joint names, and are deposited in the joint names at some bank or other place of equal safety.

If a trustee is found guilty of a breach of trust, and is ordered by the court to make good the money which he has lost, the beneficiaries can compel any one or more of the trustees to make good the loss; but the one who has in fact made it good can sue the other or others for their share. If a breach of trust has been committed at the instigation of a beneficiary, and the trustee is ordered to make it good to the trust estate, the court will also order the beneficiary in question to indemnify the trustee out of his share of the trust funds.

Trusts are very often family affairs, and it is sometimes inconvenient to administer them on strict lines; but a trustee who departs from the straight path, even with the best intentions, may find himself landed with heavy liabilities, as a consequence of his mishandling of trust funds. The following case, although an hypothetical one, may serve as an example.

Suppose, for example, a man left all his estate to trustees upon trust to pay the income to his wife for life, and after her death to divide the capital amongst his children. It may be that the estate is a very small one, and that upon some emergency the widow's income does not suffice for her needs, and she asks that a portion of the capital shall be handed to her or used for the benefit of herself or one of the children. If all the children are of full age, the trustee will be safe if he procures them all to sign a letter requesting him to make the payment which their mother requests; otherwise he is running a risk.

A trustee is not allowed to use money for his own purposes out of the trust money, or to make any profit out of his trusteeship,

unless expressly permitted to do so by the trust deed. It sometimes happens that where money is invested at low interest in government securities a trustee will say, "Let me use the money in my business and I will pay 7½ per cent." If he does use the money in his business, and makes a profit out of it of more than 7½ per cent., he can be compelled to hand over every penny of that profit. On the other hand, should he lose the money, he is liable to pay the whole of it back with 5 per cent. interest.

When a trustee is in doubt as to the proper course to take, especially where the will or deed is of doubtful construction, his best course is to apply to the court. Anybody interested in the trust has a similar right to apply to the court on doubtful points. See *Executor; Guardian; Ward*.

TRY SQUARE. This is a carpenter's tool, used for testing the accuracy of right angles. As can be seen from the accompanying illustration, it consists of a flat parallel-sided steel blade attached to a stock made of a parallel-sided piece of hardwood. The working edge of the stock is faced with a strip of brass, the angle between the face of the brass and the inner edge of the steel blade being exactly 90°.

In a well-made square the outer edges should be at right angles, and when the square is placed on a level surface in a vertical position, the blade should be at right angles to the level surface.

T SQUARE. Used for drawing parallel lines, usually horizontal, a T square comprises a long blade of mahogany or other wood, and a stock made of thicker wood. The working edge of the blade and the stock should be at right angles to one another, the blade and the stock being firmly united by dowel pins and screws. Its most extensive application is in the preparation of drawings, when the T square is used in conjunction with a drawing board. It should be slightly longer than the board. Probably the most serviceable pattern is a mahogany T square about 30 in. long. A common type is made in pearwood. The usual practice is to have the left-hand edge



Try Square. Testing a joint for uprightness.

bottom for drainage, and crooks (pieces of broken flower pot) placed over them. It is necessary to use loamy (turf) soil for the bulk of the compost; a little decayed manure can be mixed in, with advantage.

Some of the best flowering plants for tubs are hydrangea, blue African lily (*Agapanthus umbellatus*), plantain lily (*Funaria*), fuchsia, lemon-scented verbena, myrtle, and rosemary. The myrtle, verbena, hydrangea, fuchsia, and agapanthus, should be kept in a frost proof place for the winter. Suitable evergreen shrubs are holly, box, bay, laurel, retinopora, rhododendron, skimmia, and laurustinus. Roses, too, can be grown in tubs.

TUBER. In gardening, a tuber is the swelling or underground expansion of the stem of a plant, stored with starchy food, which gives nourishment to the young buds or eyes which it bears at intervals, until they are strong enough to obtain nourishment direct from the soil. When a stock of plants is increased by separating the tubers, as with potatoes and dahlias, the resulting crop is always true to type.

TUBERCULOSIS. Commonly known as "T.B.," this disease is of world-wide occurrence. It has been known since ancient times. The most prevalent form affects the lungs (pulmonary tuberculosis), and this is often called by its Greek name phthisis or wasting disease, once commonly referred to as consumption.

The disease also attacks glands, joints, bones, bladder, testicles, and kidneys. If the bacillus attacks the brain, tubercular meningitis results. Bovine tuberculosis is caused by a bacillus which attacks cows and other animals; untreated milk from infected cows may transfer the disease to those drinking it.

Pulmonary tuberculosis, the commonest form, results from the entry of the tubercle bacillus into the lungs. Outside the human body, the tubercle bacillus is found in dust, in expectoration that has been coughed up by patients suffering from the disease, and in some articles of food, especially in milk.

The sufferer from tuberculosis is a source of danger

to others if he coughs without first putting a handkerchief to his mouth, and if he expectorates without receiving the sputum into a vessel containing a disinfectant fluid. Sputum containing the tubercle bacilli is dangerous only when it dries. As long as it is moist, the germs remain in it. When, however, it dries they are liberated from the sputum and blow about in the air and dust. This explains how infection is often spread.

Thus, a person working in the same office or shop with one suffering from pulmonary tuberculosis is likely to breathe in dust which has been infected by the insanitary habit of expectorating on to the floor or grate, or even into the handkerchief if the sputum dries upon it. The habit of moistening the fingers with saliva when turning the pages of a book is also dangerous. Lung tuberculosis is not a congenital disease.

The symptoms may start with dramatic rapidity; nevertheless, it should be remembered that the germs of pulmonary tuberculosis have probably been firmly established in the lungs for some time before the first symptoms become manifest. The most dramatic of the acute forms first becomes noticeable with the coughing up of blood. The amount thus expectorated may vary from a few streaks, or small clots, to liquid blood up to half a pint or even more.

In the acute forms of onset there is never any doubt that the patient is very ill and unfit for any work. When, however, the disease begins insidiously, as it does in the majority of instances, the initial symptoms are slight and very varied, and the sufferer often carries on with his work long before medical advice is sought. The most frequent early symptoms of lung tuberculosis are as follows:

A persistent cough, perhaps following on a severe cold or influenza. It may or may not be accompanied by some expectoration.

Lassitude, a very important symptom. Mental and physical exertion quickly cause fatigue.

A persistent loss of weight; the body weight forms a useful guide to the progress of the disease.

Loss of appetite, pains or discomfort after meals, or flatulence. In all such instances of indigestion a medical examination should be made of the chest.

Shortness of breath and palpitations.

The nervous system may be markedly disturbed in the early stages. The patient lacks concentration and application, is easily exhausted, and may have groundless fears.

Periodical attacks of fever, with rise of temperature and shivering, may occur, or more often there is only a slight rise of temperature towards the end of the day. This may be followed by night sweats.

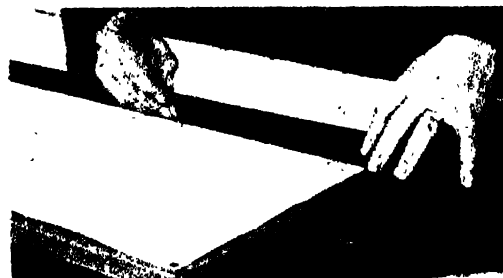
In women, a cessation of the menstrual periods may occur. Pain in the chest, apart from pleurisy, may develop insidiously and prove an early symptom of the disease.

Hoarseness is sometimes the first symptom which attracts attention, and from time to time patients are seen whose only complaint is of their voice, but in whom a chest examination reveals the presence of pulmonary tuberculosis.

Early diagnosis by skilled medical examination is of vital importance, and should be sought without delay.

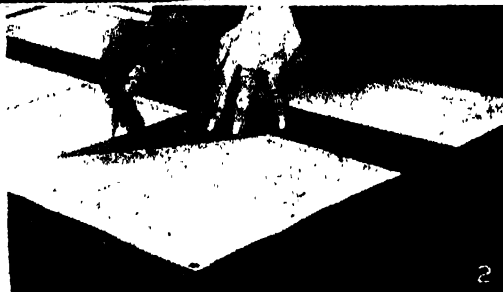
In its early stages, when treatment will yield best hopes of a cure, or of the progress of the disease being arrested, diagnosis is sometimes difficult and requires specialised knowledge.

Rest is a very important factor in the treatment of lung tuberculosis. As soon as the disease is diagnosed, and irrespective of the temperature and pulse rate, the patient should be put to bed and kept there; home treatment,



of the drawing board smooth and true, and to work the T square from this edge. The mode of operation is illustrated in Figs. 1 and 2. See *Drawing; Set Square*.

TUB. Tubs are employed for various domestic purposes. In former days they were much used for washing, and the dolly tub, as it is still called, is sometimes seen to-day. Another use is for holding



T square. Fig. 1, a square in use, being guided by the prepared edge of the drawing board. Fig. 2, How to hold the T square while using at the same time a set square tested against it.

if this is considered possible, then following on the lines laid down by the doctor.

The patient's life may depend upon absolutely skilled treatment at this stage, and not every medical practitioner or nurse has had the opportunity to acquire that essential skill.

One thing which should be seriously impressed on the patient is that he should not swallow his sputum. The danger of this lies in the fact that he runs a very serious risk of developing tuberculosis of the bowels if sputum containing the germs of lung tuberculosis is swallowed.

There is no known specific cure for lung tuberculosis. Often, surgery must be resorted to, and treatment may extend over three or four years, or longer. The greatest hope lies in getting the sufferer admitted *without delay* to a hospital specialising in the treatment of tuberculosis, or to an efficient sanatorium. In this connexion the county "T.B." officer will be helpful. Unfortunately, precious months may elapse before admittance, during which time the chances of a cure, or of arresting the progress of the disease, may become more and more remote.

The Disease in Poultry. Tuberculosis is one of the most common diseases of fowls and other birds. Affected fowls become anaemic, listless, and emaciated. The comb and wattles become pale, and in the later stages there is usually persistent diarrhoea, followed by exhaustion and death.

All diseased birds should be killed and buried in lime or burnt; the poultry house should receive several thorough applications of disinfectant, and the tainted run should be heavily dressed with quicklime and dug over. Several months should elapse before birds are put back into old quarters that have been cleansed and disinfected.

Where the disease breaks out, it is best to clear off old stock and make a fresh start with new stock later. Attempts to deal only with diseased birds, with a view to saving part of the stock, are almost certain to lead to disappointment, and new cases among birds in the flock will come to light from time to time. When the premises have been thoroughly disinfected the new stock should be carefully selected from strong, healthy birds, which should not be brought on whilst any part of the original stock remains. If this is impracticable, the old and the new stock should be separated from each other.

The disease, in exceptional cases, may be transmitted from affected birds through the eggs to the chicks, though the latter may not show symptoms until they are fairly well grown. It is advisable, therefore, not to use any eggs for hatching which have been derived from fowls amongst which tuberculosis is known or suspected to exist.

TUBEROSE. This is a half-hardy, tuberous-rooted plant with white, fragrant flowers. The botanical name is *Polyanthes tuberosa*. The tuberose is grown from imported bulbs which should be potted singly in 4 in. or 5 in. pots in a compost of loam and decayed manure or leaf-mould and a liberal admixture of sand. Leave the upper part of the tuber exposed. Stand the pots in a frame or cool greenhouse and give very little water for two or three weeks; then put them in a warm house in successional batches and keep the soil moist. This will ensure a long supply of bloom. The flowers are charming for wreaths, buttonholes, and bouquets.

TUCK: How to Make. A stitched fold taken up double in the material and arranged to lie over single material constitutes a tuck. They are made on the right side of the fabric, and vary in width. Generally, they are arranged in groups.

The distances allowed between the tucks is very much a matter of taste. Narrow tucks

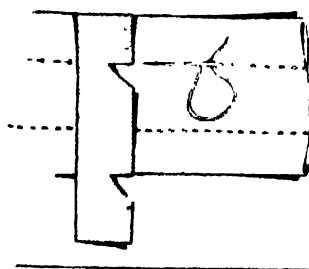
may almost touch each other, or the space apart may be the tuck's width; where the tucks are very wide the distance between may be less than their width. Unless the tucks are being made in a garment cut from a paper pattern, on which both the tucks and spaces would be marked, it is a good plan to experiment with a piece of paper till a satisfactory effect is gained.

The narrowest tucks are termed pin tucks. As these only necessitate the taking up of a few threads of material in each a group will not seriously effect the length or width of a garment, but for wider tucks extra material must be allowed. For instance, a tuck that is to be $\frac{1}{2}$ in. wide when finished will take up $\frac{1}{2}$ in. of material, and be over $\frac{1}{2}$ in. i.e. the tuck width.

In making tucks the great point is that they must be straight whatever the width. For a pin tuck it is sufficient, at the position needed, to take up the truest fold of the material, crease it and run in the stitches as near as

possible to the fold, repeating the process for succeeding tucks. For a deeper tuck, take up a fold in the material at the position needed, crease firmly, then below the fold at the requisite depth put in a row of stitching right

through the double thickness of the material. To keep the tuck of an even width throughout it is a good plan to use a guide as shown. For this guide cut a narrow strip of cardboard, place the top edge to the folded edge of the tuck, and where the stitching is required make a straight cut into the card, and cut down again in a sloping direction as shown. When working, this piece of cardboard can be slipped along the tuck, and the stitching put in a thread or so below the



Tuck. Showing the use of a cardboard gauge to ensure evenness of the tucks

straight cut, so keeping it even. For each succeeding tuck, the same notch is used for the width, but to maintain an equal distance between the tucks another straight and sloping cut is first made in the card at the position of the folded down edge of the first tuck. See French Fold, Binding.

TUDOR STYLE IN HOUSE AND FURNISHING

Models which Influence Design and Craftsmanship To-day

This article belongs to the group in our work dealing with British period styles in building, decoration, and furnishing. Other entries containing information on Tudor style are: Chimney, Door, Fireplace, House, Linenfold, Lining, Sashes, Staircase, Stairs, and Stoves. W.212 Stained Glass, Staircase, Stairs, also contain style.

Although the Tudor style in architecture is described as transitional between the Gothic and Renaissance, it possessed marked features which resulted in a blend that was essentially English and culminated in the creation of many beautiful buildings including such famous dwellings as Hampton Court, St James's Palace, and Radcliff Hall.

Nominally, including the years between 1485 and 1603, it found its chief national expression during the reigns of Henry VIII and Elizabeth. Founded on the austerity of the Gothic tradition, colour and comfort were

added as the rich influence of the Renaissance spread during the latter reign.

Throughout the 16th century there occurred in England a remarkable development in domestic architecture, made possible by the increased security that followed the abatement of the civil wars. Manor houses were built instead of moated and fortified dwellings and town planning was carried out.

Early Tudor houses, even the important ones, show little orderliness either of elevation or plan, but the lack of symmetry gives them picturesqueness. Gables and central or



Tudor Style. FIG. 1. Tudor room in the richly decorated manner of the latter half of the 16th century. The oak panelling, inlaid in holly and box oak, was removed from the room known as the "inlaid room," at Sixsark Castle, Westmorland.

By permission of the Director, Victoria & Albert Museum, S. Kensington.

flanking towers in the larger ones, lean-to roofs in the smaller farmhouse type, very substantial chimney stacks, beautiful stonework around doors and windows, cusped window heads showing trefoil and quatrefoil formations, the Tudor arch, and the half-timbered walls to be found on many, are all features which make them attractive.

One way to distinguish early from late Tudor is by the windows. In the former there is only one row of lights, and these are quite small, though probably large enough for the height of the rooms they served. The reluctance to have large windows in outside walls still lingered, a relic of the tradition that a house should show as few vulnerable points as possible to hostile missiles from outside. Also glazing was not in general use and glass was expensive. As late as 1573 it is recorded that the windows of a country mansion belonging to the duke of Northumberland were carefully stored during his absence in London for fear the precious glass should be broken, and other similar cases are on record.

Later the window space was enlarged, transoms or crossbars were introduced, and windows were brought into conformity with the latter ceilings and larger apartments generally that were characteristic of the end of the 16th century.

Tudor designers always made a feature of their chimneys. The method was to group two or three fireplaces together, as is done nowadays, but the flues were carried up the great stone or brickwork stack in single shafts, which were often surmounted by handsome caps. In the reign of Henry VIII chimneys were often twisted and counter twisted, they were wreathed with spiral bands of stone or brick, or the shafts were intricately panelled. This characteristic feature is revived in moderation and adapted to-day by architects for suitable houses. Some examples are shown in page 238, as illustrations to the article on Chimney.

The arched window disappeared in favour of the square-headed one, and in important houses classic pilasters were used to frame the mullioned windows, a complete entablature at every floor level made the circuit of the

building instead of the plain string course, and the gables were frequently linked together by a balustraded parapet, all in obedience to the new feeling for orderly design in the Renaissance manner.

The various wings of the larger Tudor houses were, as a rule, only one room wide, which meant that some of the rooms had to be thoroughfare rooms; a very inconvenient arrangement in modern eyes. Then the typical staircase of the Tudor house was of the cork-screw type: a straight flight in the thickness of a wall was its alternative.

One feature, however, of later Tudor architecture, viz., the bay window, readily adapts itself to modern building, and even the overhanging oriel window can be copied with charming effect where the design admits of something of this kind.

It is probably true that a larger proportion of country and suburban houses built during the latter years of and since the end of the 16th century are based on the Tudor model than on any other period style. They are only beautiful when designs are modified and adapted by highly skilled architects, who avoid superficial imitations which have either lost significance in modern surroundings or are out of keeping with the size of the house, but bring into the scheme the essential features evolved to suit an English background. The builders and craftsmen of the Tudor period used the materials close at hand. Thus in the Cotswold district and in Somerset 16th century houses are mainly of stone, while in Surrey, Sussex, and Kent they are half-timbered, oak framed, the panels between the timbers being filled in with wattle and daub, both inside and out, and washed with buff or white.

Interior Decoration and Furniture. Excepting the halls of the larger mansions, or manor houses, rooms of the earlier Tudor period were low built, while doors and fireplaces show the flat arched openings of the shape known to-day as the Tudor arch. Lattenfold panelling was replaced in the houses of the rich by more decorated styles and as rooms were built higher in the larger houses, ceilings were also intricately and lavishly decorated. Colour was often introduced into their plaster work modelled in floral and heraldic designs.

An example of a beautiful Elizabethan room, reconstructed in the Victoria and Albert Museum, is shown in Fig. 1. The panelling was removed from the room known as the "inlaid room" at Sizergh Castle, Westmorland, and the frieze and ceiling are reproductions in plaster from the originals still at Sizergh Castle. The ceiling is enriched with pendant ornaments from which spring ribs forming compartments with floral designs, medallions of goats, chained stags and shields of arms. The plaster frieze has a repeating floral pattern with demi-figures. The panelling is of oak inlaid in holly and bog oak. The upper portion has a row of arcades, while the lower portion or dado is divided into panels by mouldings. There are three horizontal bands of geometrical inlay.

In Tudor days colour was lavishly used in strong, bold tones: reds, greens, and white were most general. Besides inlay, gilded and coloured wood and plaster enrichments, tapestry (mostly imported) and



Tudor Style. Fig. 3. Oak cabinet, 4 feet high on a stand with legs united by square stretchers. The carving is simple, but the design of the lower panels shows the popular arched formation.

(Victoria & Albert Museum)

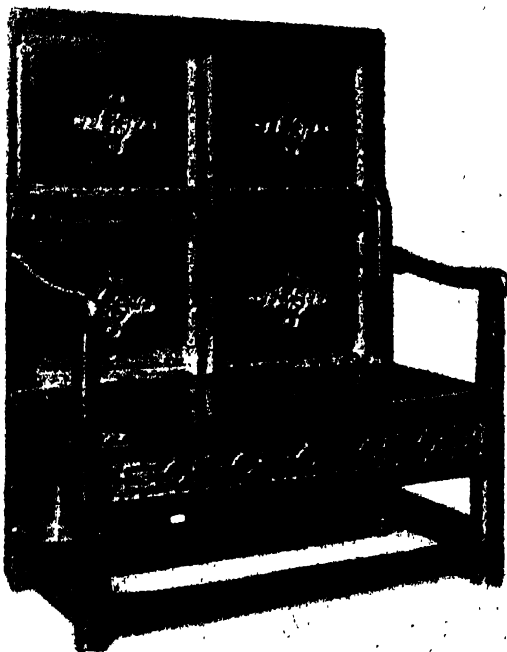
painted canvas or tapestry needlework hangings were employed as wall coverings. Stained glass was introduced into the windows by wealthy householders. Chimney pieces were massively decorated above the fireplaces with coloured and gilded ornamentations in stone, plaster, and woodwork. Floors were of wood blocks, of elm planks and of brick or stone.

Carpets began to be imported from the East. They were small in size in comparison to the rooms, as may be seen in Fig. 1, but made up for this in richness of colour. Delicate tones are out of place in any Tudor decorative scheme, and the same may be said of flimsy materials. Velvet, linen (plain or embroidered) heavy satin and damask were the textile fabrics used.

The pieces of furniture, though still scanty, increased in variety in late Tudor times. In Fig. 1, the forerunner of the gate-leg table is seen on the right, and a carved oak side table on the left, while the beautiful chair, the chest and also the tester and headboard of the bed are decorated with inlay and carving.

The oak settle illustrated in Fig. 2, has the panelled back with carved motifs frequently seen on later Tudor pieces of the less costly type. Strapwork and guilloché decoration was also much used on these. Renaissance ornament consisted of classical heads in medallions, dolphin-headed scrolls, vases and floral forms. Fine carving in this style was done on seats, court cupboard, and chests designed for great houses.

Earlier furniture was more austere. It was often carved with linenfold; horizontal, and vertical and the pieces were simple in shape. The oak cabinet illustrated in Fig. 3 has inspired the shape of countless cabinets in different styles of decoration and in different woods which have been constructed through intervening periods, and still find places in modern rooms.



Tudor Style. Fig. 2. Double seated bench or settle in oak. The carved motifs in the panel of back and the frieze of the seat show designs in low relief characteristic of the period.

By permission of the Director, Victoria & Albert Museum

TULIP. This is the most brilliantly coloured of spring and early summer flowers and unsurpassed for providing an attractive display in beds and borders. The two chief types are the early or April flowering tulips and the May flowering tulips, which consist of Darwin and Cottage varieties.

The tulips which bloom in April are great favourites for planting in spring flower beds, where they provide sheets of glowing colour. The bulbs should be set 3 in. deep and about 7 in. apart in October; as the soil is dug, some thoroughly decayed manure and a sprinkling of bone meal should be added. If the soil is clayey it is a good plan to add sand. Some of the finest varieties are: Artus, bright red; Chrysolora, yellow; Cottage Maid, rose and white; Couleur Cardinal, crimson-scarlet; Primrose Queen, pale yellow; Prince of Austria, orange buff, fragrant; Queen of the Netherlands, pink; White Swan, white; and Yellow Prince, yellow, fragrant.

The double tulips which bloom in April have large and handsome flowers. Couronne d'Or, orange yellow; El Tornado, red and yellow; Imperator rubrorum, red; Murillo, pale rose; and Vuurbak, scarlet, are some of the best. The April flowering tulips are about 12 in. high when in bloom.

The May tulips are magnificent flowers; the large, handsome blooms are on stems from 20 to 30 in. high. The bulbs should be set early in November, 5 in. deep on heavy soil, 6 in. deep on light soil, and about 10 in. apart. In association with Siberian wall-flower and forget-me-not they provide many brilliant colour schemes.

Most of the Darwin tulips have immense cup-shaped blooms, those of the cottage tulips are chiefly long and pointed. A few of the finest Darwin tulips are: Antony Rozen, rose; Bartagon, red; Clara Butt, pink; Europe, rose red; Farncombe Sanders, red; La Tulipe Noire, almost black; Pride of Haarlem, carmine; Rev. H. Ewbank, lavender; The Bishop, pale purple, and Zwaneburg white.

These are beautiful cottage tulips: Amber Crown, amber-rose; Bouton d'Or, yellow; Carrara, white; Doni Pedro, maroon and brown; gesneriana lutea, yellow; gesneriana spathulata, deep red; Golden Crown, orange-red and yellow; Inglescombe Pink, rose pink; La Mercelle, rose and buff; Moonlight, pale yellow; Mrs. Moon, yellow; Walter T. Ware, golden yellow.

The parrot tulips are striking flowers of brilliant colouring with deeply cut petals. They bloom in May; the stems are weak and must be supported or the flowers will be spoilt. The old English tulips, which are classified as *bizarri*, *byblossens* and *roses*, according to their colours, are rarely grown nowadays, except by connoisseurs and exhibitors. The flowers of the Rembrandt tulips, which open in May, are blotched and striped with various colours. Three new types of tulip are the lily-flowered with reflexed petals, which are in full bloom in May; Mendel, specially adapted for cultivation in pots under glass, and the Triumph tulips, which are intermediate between the April and the May flowering varieties.

Some of the wild species of tulip are very beautiful and suitable for planting in the rock garden. *Clusiana*, red and white; *Greign*,

scarlet; *Kaufmanniana*, cream; *limifolia*, scarlet; and *persica*, bronze yellow—all these are usually thought to be particularly attractive.

The Duc Van Thol tulips, with red, pale rose or yellow blooms, if potted in August-September and grown under glass, will bloom in winter. Some of the April flowering tulips also do well in pots. See Colour Plate facing page 1229.

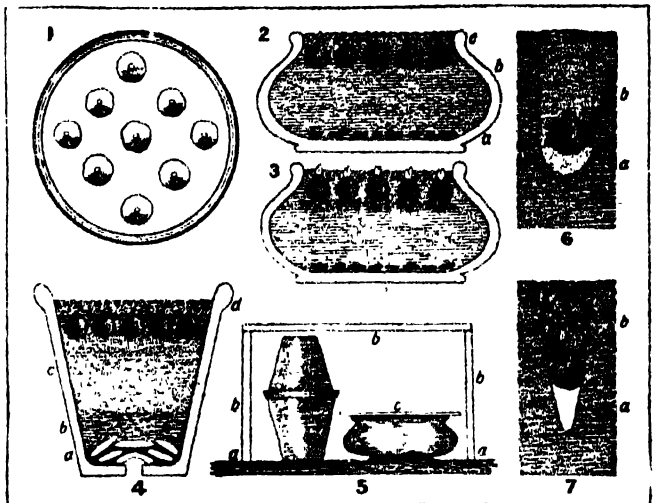
TULIP TREE.

This is the common name of a North American leaf-losing tree (*Liriodendron tulipifera*), which is hardy in Great Britain. It belongs to the magnolia family, will reach a height of 60 ft. or more, and thrives best in loamy soil. The green and white flowers open in spring.

TULIPWOOD. This is a richly figured wood used in former days for inlaying and marquetry. It was used to decorate pieces of furniture made in the Adam and Louis styles, and was employed with much effect by the great French cabinet makers. See Louis Style Marquetry, Wood.

TULLE. The thin gauze-like silk material which is known as tulle can be obtained in a large number of shades, and, in spite of its transparency, wears fairly well in a good quality. Its chief use is for scarves and evening dresses, although fine silk net is more suitable for the latter.

TUMBLER. The original tumbler drinking vessel had a pointed base, and could not therefore be put down without tumbling over. Tumblers are



Tulip Culture. 1. Placing bulbs in pots or bowls. 2. Bow culture: a, charcoal; b, fibre; c, moss. 3. Stage at which light should be allowed. 4. Pot culture: a, crocks; b, rough soil; c, compost; d, moss. 5. After planting: a, ashes; b, covering box; c, glass. 6. Correct outdoor planting: a, sand; b, fine soil. 7. Bad planting: a, water accumulation; b, lumpy soil instead of fine compost.

made in varied qualities. The best are of fine cut glass. They are usually sold in dozens or half-dozen, sometimes to match the rest of the table glass, and can be had in several sizes.

Antique tumblers may be valuable. They were made toward the end of the 17th century by the great glassworker John Greene. These were either plain or ribbed, horizontally or perpendicularly, or adorned with surface-moulding, pressed, as it is called. They were of different sizes, and many were originally arranged in nests, each nest containing 6 or 12. For beer they were made in their present shape early in the 18th century, but good specimens are rare.

The best tumblers date from the middle of the 18th century. These taper very slightly and are sometimes engraved with sprays of roses, with hops and barley, or with a vine pattern. Toward the end of the 18th century the tumbler became fairly common. Those seen in antique shops are chiefly of the early part of the 19th century. They include squat and heavy examples made of fine cut glass as well as the taller pattern, tapering considerably and cut nearly all over in a series of indentations. See Glass Ware: Rummer.

TUMOUR. In medicine the technical name for a growth is tumour, and there are two main groups, the simple and the malignant. A simple tumour, if it does damage, does so only by pressing on neighbouring structures. A malignant tumour, on the other hand, infiltrates and destroys adjoining tissues, and at the same time its cells are carried by the lymph or blood streams to distant parts, where they grow. Thus a cancer in the breast or in the stomach may lead to a secondary growth in the brain. Hollow tumours are given the name of cysts. They contain some kind of fluid. See Cancer.

TUNICA. These pretty little hardy plants belong to the pink family. The most attractive is *Tunica saxifraga*, 8 to 10 in. high, with slender stems and small, bluish-coloured flowers in summer. It is suitable for the rock garden or for setting in the crevices of paved paths. Seeds may be sown in spring where the plants are to bloom in summer, or the seedlings can be raised under glass and transplanted.

TUNING: In Wireless Reception. This is the act of bringing the tuned circuit, or circuits, of a receiver into resonance with the wave-length of a broadcast transmitter.

Tuning is normally carried out by means of a variable condenser connected across an



Tulip. Beautifully shaped pink blooms of the Inglescombe variety, suitable for outdoor planting. Above, vivid flowers of the parrot tulip.

inductance coil, and the circuit is said to be in resonance or tune when the condenser control is adjusted so as to give clearest reception.

A receiver will normally give the best results only when the wave-length to which its high-frequency circuit or circuits are adjusted is the same as the desired broadcast transmission.

In a super heterodyne receiver, however, certain of the high frequency circuits are permanently tuned to one definite wave-length, the energy from any broadcasting station being changed to this one fixed wave-length by a special process in the receiver, after selection by initial variable tuning. See Selectivity.

TUNING FORK. A tuning fork consists of a bar of steel bent into an elongated U-shape, with the prongs supported at the bend by a foot. When struck smartly upon a firm but not hard body it gives a very pure musical note, free from harmonic upper partials. It retains pitch very accurately, and is tuned to the A above middle C, used by orchestras as their fundamental tuning note.

By means of an electro magnet and a light make-and-break contact, a tuning fork can be kept continuously in vibration.

TUNNY FISH. This is a fish of the mackerel tribe, sometimes preserved in oil. It is served as hors d'oeuvres, being cut into thin slices and having fresh oil poured over it.

A savoury of tunny fish can be made in the following way. Prepare a thick white sauce, add to it some flaked tunny fish, and cook slowly until the fish is heated through. Then pour the mixture on to small rounds of hot buttered toast, and serve at once.



Turbot. Boiled turbot garnished with slices of lemon and some parsley

TURBOT: How to Cook. The finest of all flat fish, turbot is at its best from April to September. The flesh is firm and white, cuts from the middle and back being the thickest and considered the best.

Turbot can be cooked in several ways, but boiling is the most favoured method. To prepare the fish first clean it, wash it in several waters, and then rub it with a piece of cut lemon to remove any discoloration of the skin. Do not cut off the fins. Turn the fish over so that the black skin is uppermost, and score this down the middle to prevent the white skin on the other side from breaking while the cooking is in progress. Then put it into a pan of boiling salted water or fish stock, laying it so that the white side of the skin is uppermost, and cook it gently until the flesh begins to leave the bones. Keep the water or stock in which the fish is cooked well-skimmed. Boiled turbot can be served with melted butter, oyster, or hollandaise sauce.

To broil turbot, first season it to taste and fry it in a dish containing a gill of salad oil and half that quantity of lemon-juice. Then broil it in front of a clear fire, basting it frequently with the oil and lemon juice and turning it several times. It can be served with oyster sauce and garnished with parsley.

Steamed turbot, coated with egg sauce, provides another good dish. To prepare it, clean the fish, place it in a steamer over boiling water, and steam it for 15-20 min. If a steamer is not available, stand the fish on a plate over a saucepan of boiling water, and cover it with

a saucepan lid or a basin. If cooked in this way it will require a little more time. Pour the egg sauce over it on the dish and proceed to serve it at once.

Made-up Dishes.

Remains of cold turbot can also be utilised in the following way. Melt a piece of margarine about half the size of an egg in a small pan, stir in 1 dessertspoonful flour, and when they are smoothly mixed add 1 teacupful milk, salt, pepper, and cayenne to taste, and $\frac{1}{2}$ teaspoonful anchovy essence. Keep stirring all the time, and when the last of these ingredients has been added, draw the pan to the side of the stove so that its contents can cool a little, and stir in the yolk of an egg.

Pour a little of this sauce into a fireproof dish, then cover it with some cold cooked turbot that has been boned and broken up with a fork. Continue with these layers until all the ingredients are used, then sprinkle some browned breadcrumbs and grated cheese over the top and bake until it is heated through.

Reheated, and served in the following way, cold turbot makes an excellent luncheon dish. Peel a small onion, stick a few cloves into it, and put it into a saucepan with $\frac{1}{2}$ pint milk and 1 oz. margarine. Let these stand at the side of the stove for an hour or so, so that the milk can become well flavoured, and in the meantime boil an egg for 15 min., then shell it, cut it into halves, and take out the yolk. Cut the white into small pieces, rub the yolk through a fine sieve, and take the skin and bones from 6 oz. cold turbot, breaking the flesh into small flakes.

When the milk has stood for the required time, bring it to the boil, take out the onion and cloves, and sprinkle in half a tumblerful of breadcrumbs, the flaked fish, white of egg, and salt and cayenne to taste. Stir these well over gentle heat until they are well mixed and thoroughly hot, allowing time for the bread to cook; then add 2 tablespoonfuls cream, and reheat the whole for a few minutes.

TURKEYS: REARING AND COOKING

Hints on the Treatment Needed to Produce Good Table Birds

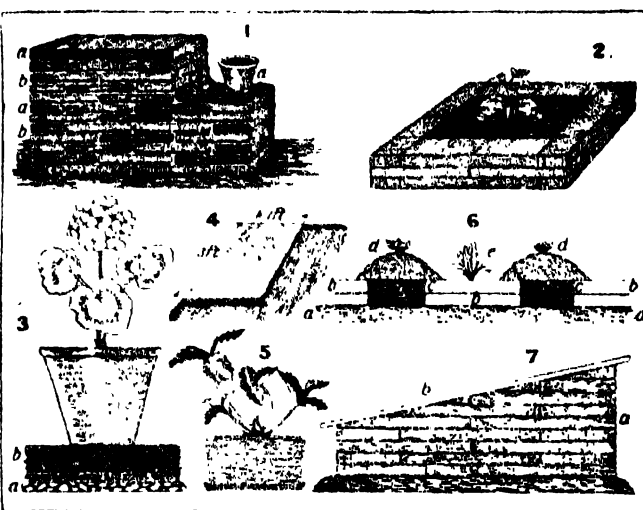
The early part of this article is mainly for the benefit of country readers. The sections on preparing and cooking the bird will be of value to readers in all districts. The articles Duck: Fowl; Poultry also Casserole; Force-meat; Stuffing, deal with related subjects. See Carving: Christmas.

The rearing of turkeys is best carried out on a large scale, one reason being that the abundance of natural food required by the bird necessitates extensive feeding grounds. They require, too, a good deal of care. Nevertheless, as smallholders and other persons with a little land may like to keep one or two, some information, issued by the Ministry of Agriculture, is here given.

Although turkeys may be raised on heavy land, as a rule they do better on lighter soils, except in dry weather, when there may be a

deficiency of green food. The best results are obtained upon a rich soil which is not absolutely heavy in character. If a choice of position is possible, preference should be given to a dry and sheltered area, facing south and protected from cold winds. Every advantage should be taken of banks, hedges, and belts of trees which will serve as wind-breaks.

The Best Breeds. The American Bronze is a popular breed of turkey, but the Cambridge Bronze is probably a better one for ordinary



Turf and its uses in garden and greenhouse. 1. Stack for potting soil: *a*, turves; *b*, layers of lime. 2. Marrow mound. 3. Turf as base for pot plants: *a*, ashes; *b*, turf. 4. Dimensions for cutting. 5. As rooting medium for seedlings: *a*, ground soil; *b*, turves; *c*, manure; *d*, mounds of soil; *e*, centre crop. 7. Turf frame: *a*, turves; *b*, top light

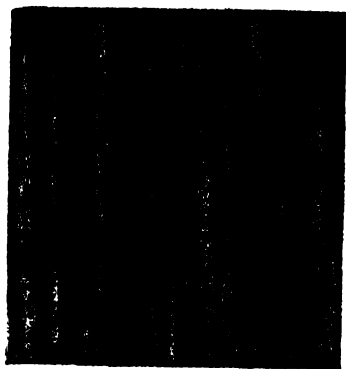
Serve it on a hot dish, garnished with lines of powdered parsley and the sieved yolk of egg.

Cold turbot may also be curried, adding the flaked cold fish to a good curry sauce. Serve very hot with a border of freshly boiled rice.

The roe of turbot should be blanched and sliced, baked in a buttered dish in a moderately hot oven, and basted frequently with the butter. It will need about 20 min. cooking. See Curry; Fish; Hollandaise Sauce; Sauce.

TUREEN. A tureen is a large dish or bowl, usually fitted with a lid. Either round or oval in shape, it is used for holding soup or sauce at the table. Tureens are often made to match a dinner service, and range, therefore, from pieces of the costliest china to those of the cheapest earthenware. They are also made in silver and Sheffield plate and some of the 18th-century specimens are of great value. See Ladle; Sauce Boat; Soup.

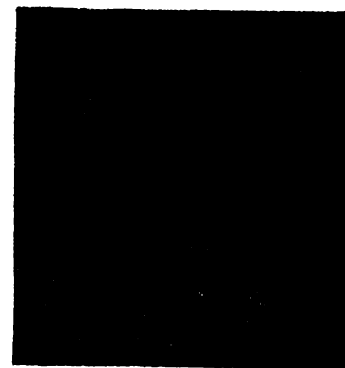
TURF. This is a term used to denote the top spit of meadow land, or a stretch of lawn. Lawns laid with turf become fit for use sooner than others made by sowing lawn grass seeds, but it is most important to lay turf which is free from weeds and coarse grass or it will cause endless labour. The chief details needing attention in the maintenance of a perfect stretch of turf in the garden are mowing, rolling, the destruction of weeds, and the use of fertilizers. If the top spit of meadow land is pared off in turves, about 4 in. thick, and stacked for a year, it becomes what the gardener calls turfy loam, the chief ingredient of potting composts. If alternate layers of manure and turf are stacked the loam will be still more valuable. See Lawn.



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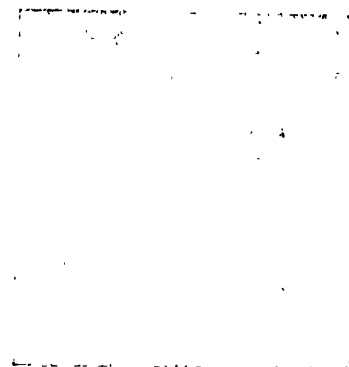
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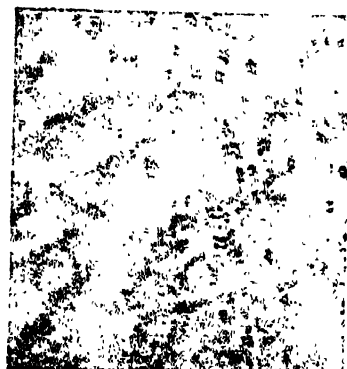
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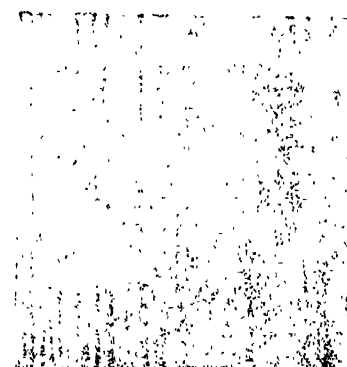
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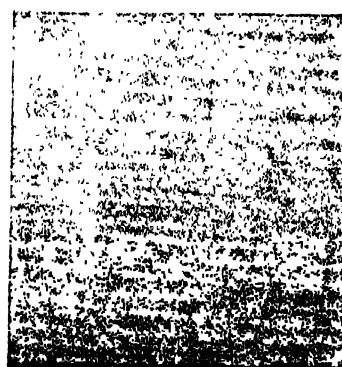
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WOOD DISTINCTIVE COLOURS AND MARKINGS OF VARIOUS KINDS

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8 Mahogany 9 Pitch Pine 10 Rosewood 11 Greywood 12 Koko For further particulars see under
the heading Wood



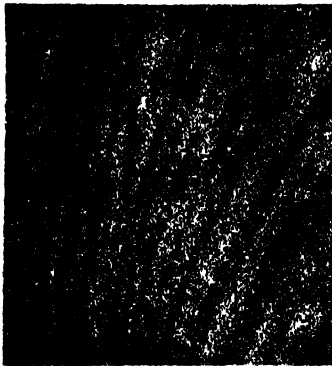
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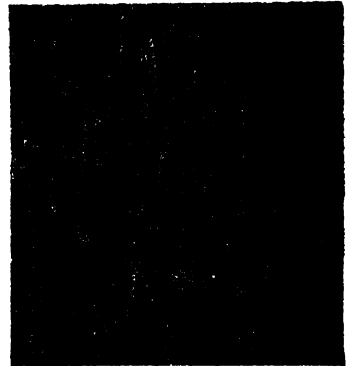
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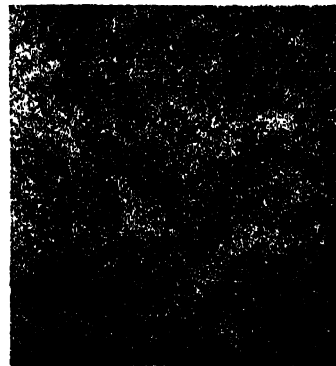
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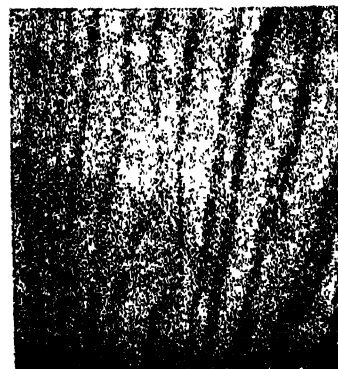
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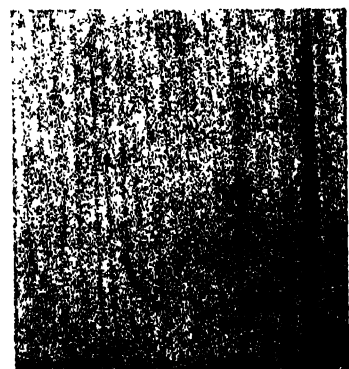
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WOOD SPECIMENS TO AID THE AMATEUR'S CHOICE

13 Bass 14 Beech 15 Satinwood 16 Black Walnut 17 Olive 18 Teak 19 Satin Walnut
20 Ebony 21 Sapele 22 Ash 23 Indian Silver Greywood 24 Elm For further particulars see
and the Leading Wood

keeping purposes. On the average its males reach from 20 to 24 lb. and its females from 12 to 16 lb. They fatten up readily. For those who want a smaller bird the white turkey is recommended, while a cross between this and the Cambridge produces a hardy bird comparatively easy to rear.

Roosting. Adult turkeys should roost in the open all the year round. Special protection may be necessary to enable them to do this, but it is better than placing the roosts under cover. Where large trees are available, the birds may be allowed to roost on the branches, if they are strong enough. If not, perches should be placed under the trees. They should be removable, and should be of fir poles, broad enough for the birds to grip firmly and raised three feet or so above the ground.

Sheds for the Birds. When turkeys must, for one reason or another be accommodated under cover, a special form of shed is necessary, because they need an abundance of fresh air. The floor must be dry, and the roof should, if possible, be watched and lofty. The walls should preferably be made of wattled turze about two feet thick, as this ensures, not only perfect ventilation, but fresh air without draught.

Turkeys usually remain on their perches until let out in the morning, when it is their habit to fly straight out and alight on the ground some distance in front of the roost. Therefore, to prevent the birds from damaging themselves, the greater part of the front of the house should be made to open with folding doors or gates consisting of strong frames hung on hinges and covered with wire netting.

Breeding Considerations. As regards breeding, close breeding should be avoided. Mere size is not very important. An approximation to 25 lb. in the males and 15 lb. in the females are suitable weights for ordinary breeding purposes, other considerations including width of shoulder, contour of breast, and a medium length of leg. Stock birds should preferably be from two to three years old, and eight or ten hens should be mated with one cock bird. Yearling hens are not recommended for breeding, but may be employed as mothers during the first season.

The correct feeding of these stock birds is important. Their diet varies according to weather and other conditions, but a suitable mash can be prepared by using equal parts of ground oats, or barley meal and middlings, to which 5 or 10 per cent of meat meal may be added, with grain at night. Many breeders, however, prefer a whole grain diet for both morning and evening feeding, using wheat, barley and oats, and adding cabbages and swedes where the pasture is poor.

Much depends upon the supply of natural food available. When this is plentiful a supply of grain as stated above is sufficient, but when natural food is scarce some soft food in which meat has been mixed should be given three or four days a week. From January onward breeding turkeys need to be in a hard condition, and they must, therefore, have plenty of exercise. A generous supply of grit and oyster shell is also essential.

During March the hen birds require watching, or they will choose an out-of-the-way spot in which to nest. It is therefore advisable to make up nests in sheltered and secluded positions in which the birds may lay their eggs. April is the best month for hatching, and it is generally undesirable to continue hatching beyond June. Turkey hens are usually good mothers, but their eggs may also be hatched under bantdoor hens. Artificial methods of hatching and raising are not recommended, though incubators are sometimes used. A turkey hen will cover 15 or 16 eggs, and a large bantdoor hen 8 or 10. The period of incubation is 28 days. The

nests should be upon earth bottoms, and the management of the eggs is similar to that of the ordinary fowl's.

Care of Young Birds. In rearing young birds the principle of the roost house should, as far as possible, be applied to the coops. The doors should be wire-netted and covered, if possible, in severe weather with sackcloth. The birds should be cooped with their natural or foster mother in a dry, sheltered position with a sunny aspect; a rich, medium soil is the most suitable. The coops must be moved a short distance daily to a fresh patch, and the hens allowed out with the young birds whenever possible. The coops should be placed on short, fresh grass where the soil is quite sweet, and for the first 10 to 14 days they should be fitted with enclosed runs in front. The coop and run should be moved daily to fresh ground.

Young turkeys should receive no food whatever for 36 hours after hatching. After that a suitable diet consists of steamed rice dried with fine sharps and mixed with curds and finely chopped green food. With any soft food an admixture of finely chopped grass food, particularly dandelion leaves, clover and lettuce, is especially beneficial. It is important that the feeding board should be sprinkled with fine, sharp grit and powdered vegetable charcoal if curds are absent from the diet.

The feeding should be begun early and continued until late in the day. Very little food is required at one time, but it is necessary to give it at frequent intervals, commencing with six meals daily, and the soft food alternated by a feed of coarse oatmeal and cracked wheat in equal parts. At about the third week the diet may be changed to include most of the foodstuffs given to ordinary chickens. Boiled wheat is also a good food during early days. Later new corn will be

they should receive a liberal feed of grain twice a day. The birds that respond most satisfactorily to the fattening process are those that have been kept in good condition from the earliest days.

About a month before they are to be killed the birds should be confined at night in a large open-fronted shed situated in a quiet position. They must be liberated daily to prevent their fretting from confinement and to allow them exercise. An abundance of soured skim milk or buttermilk is necessary in order to give colour and mellowness to the flesh, and, in addition, to stimulate by the acid in the milk, the appetite which might otherwise fail.

A suitable food for these days is Sussex ground oats, wheat meal, or barley meal and sharps, and in many cases cooked potatoes or beetroots are mixed with the meal in the proportion of one part of the roots to two parts of meal. Soured skim milk or buttermilk is used for mixing the meals into a crumbly, moist condition. Once or twice weekly boiled meat offals should be given with the soft food. The meat should be finely chopped, and the liquor used in place of milk for mixing the meals. The Sussex ground oats is made by grinding oats into a fine meal. The special finely ground product is obtained by mixing a small proportion of barley with hard, flinty oats.

During the fattening period some give the birds rice boiled in milk, in order to whiten the flesh. For the evening wheat, oats or barley is usually given in place of the mixture mentioned above, though some prefer to give soft food entirely. Plenty of grit, to which may be added small pieces of vegetable charcoal, should be supplied in a box, or hopper, so that the birds may use as much as they want.

Turkeys should be killed by dislocation of the neck after having been starved for 24 hours. They should be plucked at once. The birds should be plucked quite clean, except for the neck and the feathers on the back, covering the hips, which are usually left on in order to prevent the skin from rubbing.

How to Cook. Turkeys are in perfection at the age of about 6 months. For braising or stewing, which demands long, slow cooking, an older bird may be used, but for roasting turkeys should be young and tender. Young turkeys are known by their smooth black legs, bright eyes, red heads and supple feet. Immediately after they are killed they should be hung up to bleed and kept for 3 or 4 days before being cooked. Turkey may be boiled, roasted, braised, made into soup, or served cold, plainly or as a poultry salad.

To roast a turkey, singe and draw the bird, wash it as quickly as possible in cold water, and stuff it with chestnut stuffing or a good veal forcemeat. Sew it up, truss it as for a roast fowl, wrap it in greased paper, and cook it in a good oven for about 2 hours. This is the time required for an average-sized bird. Keep it well basted and take the paper from the breast a little while before lifting the bird out of the oven. When it is ready, put it on a hot dish, remove the trussing threads and strings, and strain some good brown gravy round it. Fried rolls of bacon make a suitable garnish, and some extra gravy should be served in a sauceboat. Cranberry sauce (see page 312) is often liked with turkey. If preferred, fried sausage may be used instead of bacon, and sausage meat is often employed for stuffing.

Boiled Turkey. Choose a medium sized bird for boiling and, after plucking it, draw it by cutting off the head, slipping down the skin round the neck, cutting off the neck and removing the crop. Turn the bird round and from the other end take out the inside, being careful not to break the gall bag. Cut



Turkey. Handsome specimen of a full-grown turkey cock with wings and tail outspread

found helpful in the birds' diet. Unless plenty of natural food is available, some meal must be included in the ration.

Fattening for the Table. The selection and separation of the birds for stock purposes should be made during the autumn, preference being given to birds of good frame and stout legs, rather than to merely heavy specimens. The birds intended for fattening should be allowed full liberty until November. Until that time, in addition to the run of the field,

off the feet and part of the legs to the first joint, draw the sinews, wipe the inside of the turkey, and truss it into shape.

To do this, loosen the skin round the legs, draw the legs under it, press them well in so as to push up the breast, and skewer them into position, or sew them with a trussing needle. Fold the loose skin from the neck over the back, and turn the wings and skewer them so that they keep this skin in position. Put some thin slices of lemon over the breast, then cover the latter with a greased paper. The bird has next to be tied in a piece of muslin.

Put the turkey in a large pan or boiling water or stock, add a few mixed herbs tied in muslin, an onion stuck with a few cloves, and a carrot and turnip. Take out the herbs after $\frac{1}{2}$ hour's cooking, or they will discolor the stock. Simmer the turkey gently for it at 24 hours, keeping the stock well skimmed, then add 2 lb. of sausages, and continue cooking for another 10 min. Serve the turkey on a large dish, place the sausages round, and pour the sauce over all. Some of the liquor in which the turkey was cooked might be served separately.

Casserole of Turkey. Braising is a good way of cooking an old turkey. Pluck, singe, draw the bird, and cut it into neat joints, cover these with thin slices of fat bacon, remove the rind, place some more bacon at the bottom of a casserole, and lay the pieces of turkey on it. Add also the washed heart and liver. Peel and cut into slices 2 carrots, 2 turnips, and an onion, add them to the casserole with the green tops of 2 stalks of celery and 4 cloves, 12 peppercorns, and some parsley stalks, thyme, and bay leaf tied together.

Pour in enough veal or vegetable stock to cover half of the turkey, bring all to the boil, and then simmer gently for 4 or 5 hours. Serve in the casserole with the vegetables, but gravy, and if necessary add a few drops of brown sauce. Season it to taste, and pour it over the turkey.

Devilled Turkey Legs. The legs of a cooked turkey make a dish in themselves, if devilled according to the following directions. With a sharp knife score the legs round and lengthways in deep, regular gashes, brush them over first with melted butter or margarine, and then with a mixture consisting of 1 teaspoonful each French and English mustard, 2 or 3 spoonfuls chopped chutney, and a sprinkling of salt, pepper, and cayenne. Over this sprinkle a few browned crumbs, then grill the legs on a greased gridiron before a charcoal fire.

When browned all over, serve them on a hot dish, with a few small pieces of margarine placed here and there. Garnish with watercress.

Turkey Blanquette. For this method of using up the remains of a cold turkey, first put the bones into a stewpan, cover them with cold water, and cook them slowly for an hour. Then strain the liquor, and with it make some white sauce, seasoning it to taste. To the sauce add some white pieces of turkey cut into neat squares, simmer all gently for about 20 min., and then draw the saucepan to the side of the heat.

Beat up the yolk of an egg with the juice of a lemon and a little of the hot sauce and add it to the stew, stirring all the time. Return the pan to the heat, and continue stirring until its contents thicken, but take care that they do not boil, or the egg will curdle. Just before serving, stir in a little finely chopped parsley. Triangles of fried bread, placed round the dish on which the stew is served, are a good garnish.

TURKEY CARPET. The knotted floor coverings that are universally recognized as Turkey carpets or rugs comprise woollen fabrics with deep red grounds, bearing conventional medallion designs with broad borders,

usually carried out in strong blues and yellows. A regular industry, with headquarters at Istanbul and Izmir (Smyrna) is engaged in meeting the demand for these productions from all parts of the world, and the designs and sizes have been more or less standardized.

The term *laney* Turkey is used for similar commercial makes, especially in carpet sizes, in which the colourings and designs are more varied. The grounds of these are available in greens, rose, orange, light blue, ivory, maves, and pinks. There is a large output of Turkey patterns in British and Continental makes, especially for stairs and corridors. By being able to tackle warps of considerable length, power looms readily turn out these goods in the piece, although such carpets lack the hand knotting of the native weavers.

There is a large production of carpets and rugs in Turkish lands, especially in Anatolia and Kurdistan. They differ from the more characteristic of the Persian rugs by being invariably made with the so-called Ghiordes or Turkish knot, one effect of which is to turn the nap toward the right or left top corner instead of straight up the rug. They also usually have wool warps and wefts, often dyed to the prevailing colour of the design, with selvaged sides and knotted warp ends.

Styles and Qualities. Various styles and qualities are distinguished by such names as *Yaprak* and *Spartak*. Some of them are very loosely woven, a *Karaman*, for example, may have not more than 10 knots to the square inch. There is also a modern output of fabrics made in the homes of the native population, in which the traditional features have a better chance of being perpetuated.

The Ghiordes rugs, formerly among the choicest of the Anatolians, and now often the poorest, frequently have a separate web sewn on the upper end, instead of being finished with plain warp threads. *Kulah* rugs, mostly of the prayer type, and often passed off as Ghiordes, are readily recognized by their many narrow border strips, which may run to 14 in number. They usually have the field filled in with smallish objects instead of being left plain, and show one instead of two cross panels outside the prayer niches. They are short piled and almost lustreless, and generally contain in the border the distinctive *Kulah* design, which suggests derivation from the dragon associated with Central Asia.

A large class of small fabrics, generally known as Anatolian mats, either display the varied characteristics of this region or reproduce more or less closely the more distinctive geometrical features of the Caucasian types. *See* Carpet, Persian Carpet, Rug.

TURKEY RHUBARB. This drug providing member of the rhubarb family is *Rheum palmatum*. It is an ornamental leaved plant flourishing in deep, rich soil in sunny positions near the water-side. Propagation is by division of the roots during the winter months. The drug is used as a stomachic and purgative. *See* Rhubarb.

TURKISH BATH. A Turkish bath is carried out in a number of rooms of different temperature, ranging from about 90° F. in the coolest to 220° or even higher in the hottest room. The greatest precautions should be taken to avoid exposure on the way home from the bath, which may lead to the contraction of a chill or severe cold. As a Turkish bath can be depressing, it is as well to have medical opinion as to one's fitness for taking it.

The hot air bath is an improvised Turkish bath, and usually takes the form either of a portable cabinet or an arrangement for an invalid for which the apparatus required is a large spirit or candle lamp with a metal funnel which can carry the hot air into a framework cage.

The interior of a hot-air bath cabinet is lined with asbestos. The heat is supplied by a lamp, or by electric lamps (the radiant heat bath). The patient sits on a chair in the bath, and care needs to be taken that unprotected skin does not come into contact with parts which may be unduly hot. This bath may be used by healthy persons who wish to have the luxury of a Turkish bath at home, and it is desirable to follow it with cold sponging or a cold plunge. It is used with benefit by persons affected with chronic rheumatism and rheumatoid arthritis, the application of cold being suitably graded. *See* Skin, Vapour Bath.

TURKISH COFFEE. Even more care is required in the preparation of Turkish coffee than for ordinary coffee. The metal pots in which it is made are sold specially for the purpose, and have long handles and spouts. They are heated on the small stands with which they are sold. The coffee should be very fresh, and very finely ground.

Enough Turkish coffee for two people can be prepared by putting 2 or 3 lumps of sugar and 4 pint water into the pot, boiling them, and then drawing the pot away from the flame while 2 large tablespoonfuls coffee are added. Reboil the whole, take the pot from the flame again for a second or two, and repeat the re-boiling 3 times. Serve the coffee without milk, in small cups. *See* Coffee.

TURKISH DELIGHT. The following is a good recipe for this sweetmeat. Take 2 lb. loaf sugar and make it into a syrup with 2 pt. water. This syrup should be cleared with the whites of 2 eggs. Add 2 tablespoonfuls lemon juice, and turn all into a sugar boiler, meanwhile dissolve 4 oz. rice starch in $\frac{1}{2}$ pint water, and when the syrup in the pan boils, stir in the dissolved starch and cook all gently, stirring the whole time until the mixture is firm and has been reduced to $\frac{1}{2}$ of its original bulk. Pour half the mixture into another pan, colour it pink, and flavour with rose essence. The remaining half should be sufficiently flavoured with the lemon, but if not, add a little essence. Have ready a few blanched almonds and pistachio nuts cut in pieces. Add some of each to both portions of delight.

Set the mixture between candy bars on a slab dredged with confectioners' starch or icing sugar and cornflour. A tin similarly prepared can be used instead of the bars. When set, divide into blocks, roll well in starch and sugar, and store in a wooden box with plenty of starch and sugar. Line the box with wax paper.

Another method is as follows. Soak 1 oz. gelatine in $\frac{1}{2}$ gill water in a saucepan, and stir over heat till it boils; let it simmer 3 or 4 min. Place in a large saucepan 1 lb. granulated sugar with another $\frac{1}{2}$ gill water, melt slowly, and bring to boiling point, then remove from the heat, and cool slightly. Add the dissolved gelatine and boil for 20 min., stirring all the time. Add 1 tablespoonful rum (if desired), the juice of an orange and of a lemon, and a strip of thinly cut lemon rind. Stand this for 20 min. in a warm place, then colour half pink and flavour with rose essence. Add a few nuts to each portion, and cut separately.

TURK'S CAP LILY. Two lilies are known by this name. Of these, *Lilium chalcidonicum* bears blossoms of scarlet, with petals rolled back; *martagon* has tiers of drooping, or curved purplish flowers.

TURMERIC. The roots of the turmeric plant when powdered have a peppery taste, yielding a condiment used in preparing mustard, curry powder, and pickles. The powder is yellow, and is a powerful dye.

TURN BUCKLE. This name is given to a type of straining device, and also to a fastener for a cupboard door. Dealing first with the former appliance, the turn buckle, or bottle screw, comprises a body in which are screwed

one or more portions adapted to receive the ends of wires, cords, or the like. The common type has two screwed ends, and will thus exert a tension upon two cords simultaneously, thus usually being accomplished by providing the body with some form of rotation threading one end with a right-handed thread and the other with a left-handed thread, the eye bolts or screwed portions being similarly threaded. When the body portion is turned with a spanner or a tommy bar the screwed portions are drawn together, so tensioning the guy rope or straining wire to which the turn buckle is attached.

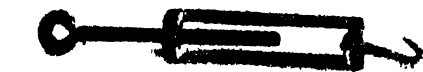
Numerous varieties of this style of turn buckle are available, and should be chosen according to their utility, length of travel, and so forth. When used out of doors, for example, as a means of tightening the stay wires supporting an aerial mast, they should preferably be of galvanized iron or some other

wood shaped at both ends and bored with a hole for a screw.

Turn buttons in japanned iron and brass are of the shape shown in Fig. 2, those made in iron are obtainable in sizes from 14 in. increasing by $\frac{1}{2}$ in. to 24 in. The same pattern in brass increases in like proportion from $\frac{1}{2}$ in. to 24 in. Half button, as in Fig. 3, in japanned iron can be obtained from 12 in. to 2 in., and in brass from $\frac{1}{2}$ in. to 1 in. A neater form of turn button is shown in Fig. 4, the button being riveted to a brass plate, and the corresponding metal plate being attached to the face of the door stile. This is used on thin wood or where extra neatness is desired, and it should be attached by means of flat-headed brass screws. One great advantage of this type is that the button cannot wear away the edge of the door as often happens with the common pattern. See Cupboard Door.

TURNING. The mechanical processes which are grouped under the general heading of turning divide into two independent groups, those associated with the turning of wood, which are dealt with in this Encyclopedia under the heading of wood turning, and the whole series which apply substantially to the turning of any kind of metal and most of the

manufactured compositions, such as ebonite, celluloid, and the like. These are treated under the title of metalturning (q.v.). The mechanical requirements of the wood and metal turner, respectively are somewhat different. For wood turning a lathe with a large flywheel is needed, and a



non-corrosive material. They should also have a fairly long travel, something in the nature of 6 in. being practical for the average wire mast.

Cupboard Turn Buckle

The second type of turn buckle, for securing cupboard doors and other hinged



Turn Buckle. Fig. 1. Turn buckle and hook for use as a straining device. Fig. 2. Type of cupboard turn buckle, showing method of fitting to a cupboard door.

structures, comprises a brass base plate in which a square, screwed shank turns, the outer end being provided with a handle and the inner end having a small lever adjustably attached to the spindle. The lever is fixed either with a small setscrew or by a screw thread and lock nut. In use the spindle passes through a clearance hole drilled through the framework of the door, the plate being screwed to the outside. The position of the lever is adjusted on the spindle so that when the door is closed and the handle turned the lever stands at right angles or parallel with the door, thus preventing the door from opening. Sometimes the fastener is provided with a more ornate plate and a drop handle, when it is usual to dispose the handle so that when it is in a vertical position the lever is horizontal. This prevents the weight of the lever rotating the handle and so allowing the door to open.

There is another kind of turn buckle which is used chiefly for securing shutters. It is in the form of a pivoted catch which operates by gravity, the weight of the handle being so disposed that it keeps the catch normally in a locked position.

Cupboard turns are liable to wear the edge of the door, especially if carelessly used. To avoid this and to repair worn doors, a neat angle plate should be fitted on the opposite door. It can be made in thin brass and let into the wood; the screws used should be placed in countersunk holes. In fitting all turn buttons care must be taken to clear the edge of the door frame and allow sufficient projection to hold the door. See Cupboard Door.

TURN BUTTON. Used for fastening doors and flaps, the turn button is made in wood and metal. The simplest form is shown in Fig. 1, and consists of a small piece of hard-

wood shaped at both ends and bored with a hole for a screw. Information on the care of a lathe, whether of the spinning wheel or the table lathe. Small wood-turning work, ornamental woodwork especially, can be carried out satisfactorily on a metal turning lathe, but for large work, e.g., a chair or table-leg, the space between headstock and tailstock is not nearly sufficient.

TURNIP. A prolonged supply of this favourite root vegetable can be assured by sowing the seeds out of doors in March and

Snowball, Greentop, Stone, and Clark Castle. Those who like yellow-fleshed turnips should choose Golden Ball or Orange Jelly, and sow the seeds in July. An early variety of turnip may be sown on a bed of fine soil on a hot bed of manure made up in January. If turnips are sown out of doors in August and September the baby tops will provide a useful winter vegetable.

The Turnip Flea. The turnip flea or fly is the most troublesome pest of this vegetable. It attacks the seedling and muddles the leaves. Frequent dustings of soot are recommended, together with an occasional application of nitrate of soda, 1 oz. per square yard of row, to encourage the seedlings to grow quickly and strongly.

Cooking Turnips. The turnip is served as a vegetable with boiled mutton, and it can be made into various dishes of dressed vegetables. It is also used for flavouring soups. Old turnips should never be served as a vegetable, as no amount of boiling will render them tender, but they can be used for flavouring. The turnip is not easily digested by delicate persons or invalids.

To prepare turnips for boiling, pare them thinly and always under the brown line which is apparent when the peel is cut into. As they are pared divide them into halves or quarters and throw them into cold water. Have ready a good sized pan of boiling water, as they need plenty of room when being boiled. Young turnips take about $\frac{1}{2}$ hour to cook and those which are rather more matured 1 $\frac{1}{2}$ hours. When the turnips are cooked, drain them thoroughly and press them in the colander with a vegetable press in order to extract

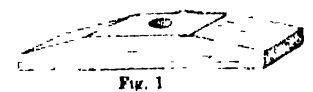


Fig. 1



Fig. 2



Fig. 3

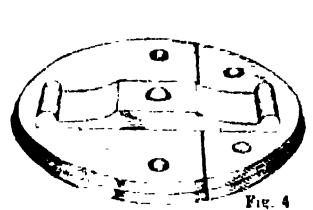
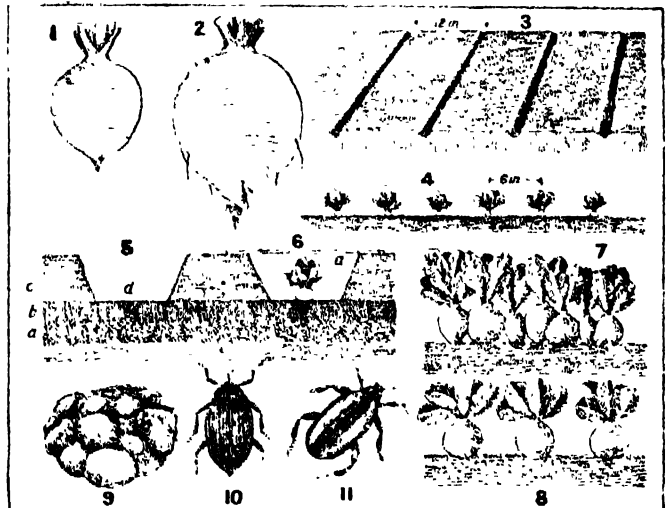


Fig. 4

Turn Button. Fig. 1. Simple form in hardwood. Fig. 2. Turn button in japanned iron or brass. Fig. 3. Half button in metal. Fig. 4. Turn button riveted to a brass plate.



Turnip Culture. 1. Type to grow. 2. Gross type inclined to woodiness. 3. Outdoor drills for sowing. 4. Good thinning. 5. Outdoor forcing: a. leaves; b. friable sandy loam; c. top soil; d. shelter and drill. 6. Plant protected with top glass. 7. Bad thinning. 8. Good thinning. 9. Turnip attacked by gall weevil. 10. Gall weevil (magnified). 11. Turnip flea beetle (magnified).

The seedlings of autumn turnips should be thinned out to 6 or 8 in. apart; some of the best varieties are

all moisture, then rub them through a wire sieve or pass them through a mincer.

To stew turnips, pare and wash them and cut them first into slices and then into dice. Allow for each lb. of turnips 2 oz. margarine, and melt it in a stewpan. Add the pieces of turnip, put on the lid, and stew very gently for from $\frac{1}{2}$ to 1 hour. Stir frequently, and when half cooked add seasoning. This method of cooking turnips is suitable for serving them in the centre of a dish of cutlets or for garnishing. They can also be served with a roast leg of lamb. A little chopped parsley sprinkled over them adds to their appearance.

TURNOVER. The turnover is made with short or flaky pastry, rolled about 2 in. thick. The shape can vary, but the filling, which can be savoury or sweet, is always placed in the centre, one half of the shape being folded over until the extreme edges meet. See Cornish Pastry, Jam Turnover, Pastry.

TURN THE TRENCHER. This is always a popular game with small children. All that is needed is a bread trencher, or a small round tray. The children sit in a circle, and each thinks of some article of a lady's toilet, e.g. brush, comb, hairpin, sponge, etc. The person leading the game then tells a story, describing how some young and beautiful lady is getting ready for a ball. As each article of the toilet is mentioned, the child who represents it has to spring into the centre where the trencher is lying and give it a brisk spin.

Another way of playing the game is for each child to choose a flower. One then picks up the trencher and spins it, at the same time calling out one of the flowers, and the child called has to catch the trencher before it stops spinning, or pay a forfeit.

TURPENTINE. Oil of turpentine is a colourless fluid with a peculiar balsamic odour and pungent, bitter taste. Externally it may be used as turpentine liniment or the acetic liniment of turpentine. Sprinkled on a hot fomentation it makes a turpentine stupe, which is often applied to the abdomen to relieve colic and gaseous distension. It may prove of value in neuralgia, lumbago, and other forms of muscular rheumatism, and in the later treatment of a sprain.

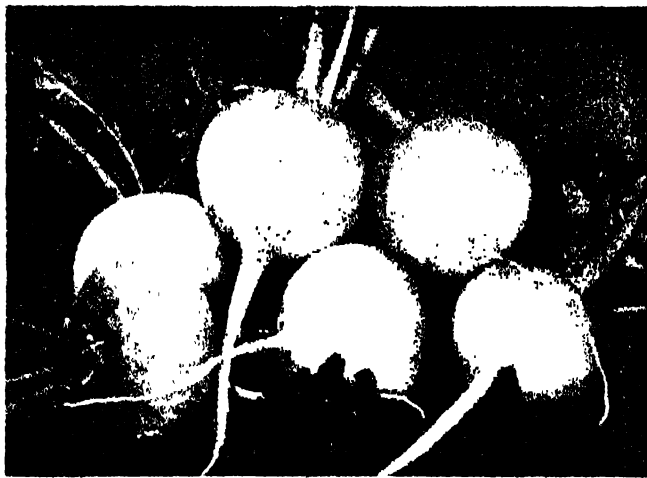
The uses of turpentine in the home are many and varied. Its odour helps to keep away black beetles, ants, flies, and mice, and shelves and cupboards sprinkled with it are rarely troubled by insects. A little turpentine sprinkled in boxes or wardrobe where woollen clothes are stored will also keep out moths.

Turpentine is also used to thin down oil paints, but when this is done the paint and turpentine must be thoroughly stirred together, otherwise the paint will show streaks when applied.

Turpentine also removes paint from used brushes preparatory to their being washed. Turpentine cannot be used for thinning down synthetic or plastic paint or for removing synthetic-paint stains. For these purposes, turpentine substitute, a white spirit distilled from petroleum, is used.

Paint stains on clothes can be removed with turpentine and household ammonia. Dip the stain first in turpentine and then in ammonia, rubbing it after each immersion. If the stain is not an obstinate one, turpentine alone is often sufficient. Grease marks on coloured fabrics will also yield to vigorous rubbing with turpentine. Place the stained part over a cloth and rub it with a clean rag dipped in turpentine, until the spot is dry.

Turpentine has antiseptic properties, and its use in the home can therefore also be recommended on medical grounds.



Turnip. Fine round roots of the green top white turnip

TURQUOISE. An opaque sky-blue or greenish blue stone, the turquoise owes its popularity mainly to its colour. It is sometimes set in rings, but, being very easily scratched, it is better suited to pendants, brooches, and necklaces. While the turquoise cannot be classed with the more precious gems, large stones of good colour fetch a high price. They are subject to changes of colour.

TUSK TENON. The joint used in carpentry under the name of the tusk tenon is so called because the tenon itself is longer than usual and extends beyond the face of the material to which it is jointed. It is held by means of a wedge driven through a hole near the outer end of the tenon.

The disposition of the parts is shown in the accompanying illustration of a trimmer tenoned and wedged to a floor post. This joint is largely used in building construction for all openings through floors and ceilings, the chief reason being that the wedge holds the tenoned member firm against the rafters or joists, and prevents the latter from springing or sagging.

The length of the tenon which extends beyond the rafter should be at least equal to the thickness of the rafter through which it passes. It is shaped and fitted in the same way as a tenon joint, after which the exact position for the wedge is marked, the tenon withdrawn from the mortise, and a hole drilled through, using a brace and large diameter bit. The hole has to be enlarged with a paring chisel, and the outer face should be slightly tapered.

The inner face, that is, the side nearest to the shoulder, is cut back so that the wedge will bear firmly against the outer face of the rafter and the outer inclined face on the tenon. The wedge must not bear on the inner wall of the hole through the tenon. The wedge should be preferably of hardwood tapered to suit the hole, and should fit exactly. When the trimmers have been fixed in place, the wedges are inserted, the rafters preferably being cramped together while the wedges are driven home. See Floor; Tenon.

TUSSILAGO. This is the botanical name of colt-foot (*Tussilago farfara*), a common British weed which bears yellow daisy-like flowers in early spring. For cultivation in gardens the best species is the winter heliotrope, *Tussilago (petasites) fragrans*, a hardy

plant, 12 in. high, which has sweet-scented, pale purple flowers in winter. Propagation is by division in autumn.

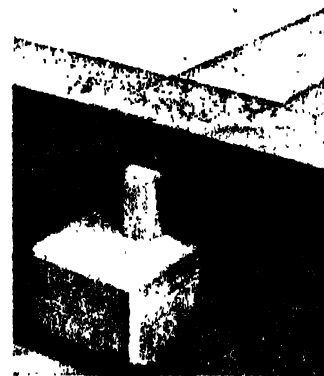
TUSSORE. The silk that is known as tussore is obtained from the cocoons of uncultivated silkworms, such as feed upon oak leaves instead of mulberry leaves. This silk is coarser, darker in colour, but often stronger than the more expensive cultivated kind. It is made into cloths of several sorts both in Europe and Asia, and the goods are often

soiled in their natural cream to brown shade, which withstands any amount of washing and exposure. See Sharfing; Silk.

TUTSAN. Sometimes known as sweet amber, the tutsan is a shrubby species of *Hypericum*, *H. androsaemum*, suitable for growing on banks or under the shade of trees. It bears yellow flowers similar to other members of the St. John's wort family. The tutsan is evergreen, and only requires trimming during April.

TUTTI-FRUTTI. Sometimes referred to as a mixed fruit ice, the sweet called tutti-frutti is prepared by cutting up some mixed fruit, dredging it with castor sugar, and soaking it with a little liqueur. When it has stood for a short time it is stirred into some half-frozen water ice, and then the freezing is continued. See Freezer; Ice.

TWEED: The Material. Hand-spun and woven tweeds are necessarily expensive to produce and command high prices. Harris



Tusk Tenon. The completed joint

tweeds made in the Hebrides carry with them a peculiar odour of peat-smoke, and of certain of the ingredients used by the dyer. Donegal tweeds, in which there are usually lumpy, bright-coloured irregularities, are much liked for sports wear.

Scotch tweeds, machine-made in Scotland, are amongst the best wearing, and are procurable in heather mixtures, checks and flecked designs, and in heavy, medium or gossamer weights. Hand-made tweeds do not usually wear as well as the best machine-made. The cheapest mill-made

tweeds are often of very poor quality, containing much shoddy and cotton. See Harris Tweed; Loom; Weaving.

TWEEZERS. Miniature pinners known as tweezers are sold by chemists and beauty specialists for removing superfluous hair from the face, especially from the eyebrows. It is not claimed for tweezers that they destroy the roots of the hair, but their frequent use has a weakening effect. Tweezers are intended as a remedy only for slight growths of hair.

TWELFTH NIGHT CAKE. If a children's party is held on the 12th day after Christmas, Jan. 6th, a Twelfth Night cake is sometimes specially made for the occasion. The cake is after the style of a Christmas cake, and ornamented with icing and coloured candies or candied fruits. Sometimes 12 small candles

are distributed round the head top, as is done with birthday cakes, and there could be a large gilt star in the centre.

TWILIGHT SLEEP. When childbirth is conducted under the influence of scopolamine and morphine the drowsiness induced by these drugs may be made sufficient to send the patient to sleep in the intervals of the labour pains. Such a condition is popularly referred to as twilight sleep.

Pain is not abolished by such treatment, and, indeed, it would be dangerous to attempt this. The memory of pain may be abolished, however, so that although the patient, on the occurrence of labour pains, may have given obvious indications of suffering, yet at the conclusion of labour she may know nothing of this.

The method is not required for short labours, as in these a few whiffs of chloroform may sufficiently ease the pangs, but in prolonged labours twilight sleep may be a decided advantage. It should, of course, be supervised by a doctor. See Childbirth.

TWILL: The Material. For materials of all kinds the method of weaving known as twill is employed, the threads being so arranged as to throw up diagonal ribs upon the surface of the cloth. Cloths are made to feel thicker by being twilled than if plain-woven. It is apparent that the twill lines commonly seen upon cloths vary in width, some being much coarser than others. Also they vary in the steepness of the diagonal, and the higher angles are most met in the finer and more closely woven fabrics.

In addition to plain twills, there are the fancy sorts, twilled alternately in opposite direction to form herringbones or chevron, and these cloths are generally satisfactory, as this method binds the threads firmly together. Twill cloths are not always alike front and back, and some of the most solid twills used for coats and costumes have a plain back.

In twilled sheets made in the best manner, the strongest threads are brought up to the surface and take most of the wear. Cheap sheets are often twilled and made partly from good cotton and partly from cotton waste. They feel thick and soft, but the twilled ribs are lumpy and irregular, whereas in the better qualities the twill lines are sharp and smooth.

Most linings are twills, and so are all serges and many tweeds. Gabardine is a kind of twill, and so is Venetian. Some of the hardest wearing cloths for riding breeches are twilled. The best velveteens are woven with twilled backs to hold the pile more firmly. Twilled matting does well for kitchen and cottage floors.

TWINE. This is the name given to a strong thread made up of two or three strands, twisted, or twined, tightly together. Usually stronger and of better quality than string, its uses are practically identical. See String.

TWO STEP. This was a simple ballroom dance at one time danced as part of the fox trot. The steps were similar to those in the galop, but danced more slowly, being written to six-eight time, although they could be danced to four-four time.

The man's steps were as follows: (1) slide the left foot to the second position, bring the right up behind the left, glide the left again to the side. Repeat the movement, beginning with the right foot. The girl's step was the same, but she began with the right foot. See Dancing. Galop; Roger de Coverley.

TWO STROKE ENGINE. This is a type of internal combustion engine in which the cycle of operations comprises one power stroke at every downward stroke of the

piston. It is contrasted with the four stroke engine, in which the power stroke occurs at alternate downward strokes of the piston. See Four-Stroke Internal Combustion Engine; Motor Cycle.

TYDAEA. This is a group of bothious, decorative plants with flowers of various showy colours. They flourish in the usual potting mixture of loam, leaf-mould, and sand in shady positions.

Propagation is by seeds sown in a mixture of sand and leaf-mould in the springtime, by cuttings of the young shoots at the same period, or by separating the rhizomatous roots. Rhizomes should be planted in 5 in. pots several in a pot, in spring to flower in summer.

TYPEWRITERS: THEIR USE AND CARE

How to Ensure the Working Efficiency of These Machines

This article explains the principles of typewriter operation, and gives hints on cleaning and maintenance, choice of ribbons, etc. It is followed by a separate article on Typewriting.

Typewriters may fall into one of two classes. The type may be arranged round the circumference of a wheel or a segment, as for example in the Hammond; the action of the keys rotating this wheel until the particular letter struck on the keyboard is brought opposite the printing point, or, alternatively, the type is carried at the end of levers or type-bars which strike the paper when the keys are depressed. Typewriters of the second class are much more numerous than those of the first, examples being the Empire, Remington, Oliver, etc.

Various devices are employed for inking the type. This may be accomplished by means of an ink-pad before the depression of the keys causes the levers to move and the type to strike the paper, but more commonly an inked ribbon is inserted between the paper and the type. This ribbon is wound from one spool to a second by the action of the machine, and so it is not worn threadbare at any particular point. A further variation is a ribbon in two colours, typing in red or black being performed by bringing the necessary part of the ribbon opposite the type-face.

A third classification may be found in the arrangement of the keyboard. Occasionally there is one key for each character's capital and small letters and for each numeral and punctuation mark, but more commonly each key strikes a capital letter, a

small letter, a figure, or a punctuation mark, the particular impression depending on the use of a subsidiary key brought into use before striking the letter key. On some models the subsidiary or shift keys raise or lower the type basket as required for the character to be used; on others the type basket is fixed and the shift key raises or lowers the platen or roller according to whether a capital or small letter, numeral or punctuation mark is required. As all machines are fitted with the universal keyboard, it is easy for anyone who has

TYING: Of Plants. The staking of trees and plants is of great importance, and, as a rule, due attention is paid to the selection and placing of supports, but the work is often rendered ineffective or even entirely useless by the neglect of proper tying. The material used for tying trees must be strong enough to stand sudden strains; it must also be sufficiently round to hold securely for a considerable time without rotting.

A knot is required that will hold firm under practically any strain and can be untied easily. The knot that best answers these requirements is the ordinary reef or sailor's knot. Green raffia is an excellent material for tying plants to their supports.

learned on one machine to work equally well on one produced by a different firm.

The Essential Operations. Although there are many kinds of typewriters, with numberless differences in detail, the mechanical parts of each bear a close relation to one another. The essential operations may be reduced to two. When the key is struck a letter must be printed, and the paper must be carried a short distance to the left before a second letter is impressed, so that the letters are printed separately, and not one on top of the other. The mechanism of the first of these operations has been described, and for the second it is better to watch a machine actually at work.

It will suffice here to say that the action depends upon the main-spring and the dogs and rack. The main-spring is trying all the time to pull the carriage right across to the left, and would do so but for the dogs and the rack. Each time a letter is struck the main-spring is allowed to pull the carriage along to the width of one letter, after which the next tooth in the rack stops further progress until another letter is struck.

Other Points to Note. Apart from the two main actions, a typewriter may be fitted with many subsidiary appliances. A bell may give warning of the end of a line; a lock may prevent the machine working after the end of the line is reached,

there may be attachments for corrections and tabulation, for facilitating the insertion of fresh paper, and the like. But it must be confessed that many of these innovations, although useful, are introduced by the manufacturers to add points to their advertisements, and the first thing an expert typist often does is to disconnect and remove most of these additional luxuries.

Most typewriters have been modified to perform visible writing, i.e., one can see the words being typed, but to a really expert typist this is not of very great importance. Possibly a



Typewriter. Royal MM, an up-to-date and popular standard model. The type keys are specially shaped to fit the fingers, while the shift, back-spacer and tabular keys are rectangular to provide greater finger surface. Other features include a touch-control to adapt key tension to individual operators' touch; an automatic paper lock to ensure accurate level; and dust covers over type bars and all principal bearings. The model illustrated takes paper 11" wide, and there are others to take paper from 12" to 32". There are 52 different styles of type available and special symbols for technical and scientific purposes.

Courtesy, Royal Typewriters

beginner may like to see that the letter printed corresponds to the key struck, or intended to be struck, but a practised typist no more needs to look at the keyboard than a pianist needs to look at the keyboard of his piano. A mistake is usually felt automatically, without any reference to the typing.

Accuracy of alignment is essential. To ensure this has called for great ingenuity on the part of the designers, confronted with the problem of making a system of levers at once strong, rigid, and light, and of supporting them on bearings which are steady and adjustable for wear in conditions where space is much restricted.

A tabulator is a very useful device when complicated tabular work has to be carried out. The carriage can be moved instantaneously from any point in one column to any point in another column, while the columns themselves can be arranged along the width of the paper.

Electric typewriters are fitted with motors which operate the mechanism automatically to return the carriage at the end of a line and move up the paper a space. They also control the keys so that only a very light tap is required, and have an automatic device for justifying the lines.

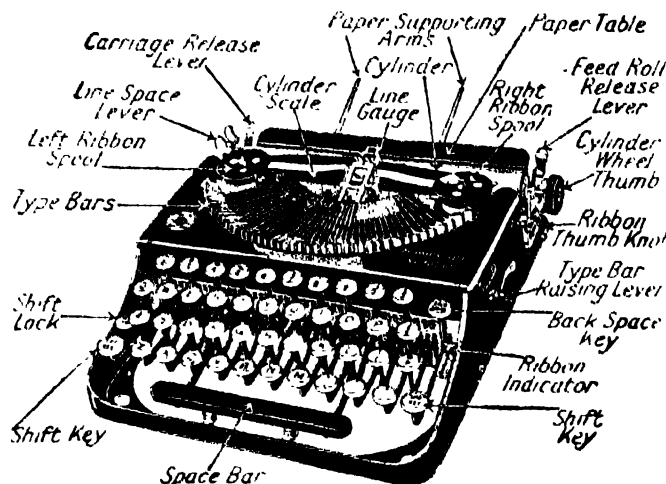
Portable Machines. Portable typewriters are made of the toughest materials and designed to resist rust, survive neglect, and withstand all the bumping incidental to travel. The Remington portable, which is here illustrated, weighs without its case 6 lb. One general rule should be followed by the operator—his or her attention should be confined to oiling the machine and keeping it free from dust; major adjustments and repairs should be done only by a qualified mechanic.

Cleaning the Machine. Cleaning is a very simple operation. Once a day the machine should be dusted over with a soft rag, the bright parts being rubbed over occasionally with a piece of chamois leather. Any accumulation of dust from creases or the surface of the paper used in the interior of the machine can be removed by using a long-handled brush sold for this purpose. Oiling is almost as simple an operation. Use only a fine quality of typewriter oil—non-gummy and oil pulverously. Too much oil is as bad as too little. Ordinary oil clogs the mechanism.

A small camel-hair brush is a convenient method of oiling every joint and moving part of contact where friction can be caused. The mechanism should be thoroughly oiled and cleaned regularly—say, once a week.

The post of the spring drum and the dogs of the escapement should be oiled twice a week, any superfluous oil being afterwards wiped off, and occasionally, about every six months, the type bar bearings should receive a drop of oil. A drawing needle dipped into the oil bottle will collect sufficient oil in the eye for each individual bearing.

Other parts should only be oiled when a squeak is heard, and in these cases the squeaks must be traced to their source, and there treated. The machine should not be given a wholesale oiling to remove a single squeak. Sliding contacts should always be wiped clean before oiling to remove dirt and gum, and after oiling all surplus outside the spot of friction should be wiped off. If this is not done the oil, instead of acting as a lubricant, will attract a large amount of dust and check the smooth working of the mechanism. If infrequent use or neglect has caused any



Typewriter. Remington portable model, showing names of principal parts
by courtesy of the Remington Typewriter Co., Ltd.

parts to become stuck with gum (either kero-line or benzine may be used for cleaning, afterwards oiling in the usual manner).

The type, which must never be allowed to become filled with dirt from the ribbon, is best cleaned by a type brush and a drop of benzine. The letters should be taken in their regular order, depressing a key with a finger of the right hand so as to push the type bar forward, when it is held by the thumb and forefinger of the left hand, and cleaned with the bristles of the brush with a downward and not a circular movement. The type bar is held in this manner to avoid straining the bearings, and should be released gently. If the round characters have become very much logged with ink or dirt, the point of a pin may be used with advantage, although the necessity for this should be avoided by frequent cleaning when possible.

Rust on the bright parts is usually caused by setting dust, which holds moisture from the air. If the machine is dusted regularly, rust will not usually make its appearance. A piece of chamois leather should be kept for rubbing the plated parts, and, of course, when not in use the machine should always be protected by its cover.

Just as a piano needs attention every few months, so a typewriter should be given a thorough overhauling by the makers or other responsible firm every few years. As originally sent out from the factory, all machines are accurately aligned, and unless the instrument is abused, it should not be necessary to return it for overhauling for at least five years. Mechanical intricacies, such as the adjustment of alignment, should never be attempted by the typist.

Ribbons and Stationery. Good typewriting can hardly be expected unless the ribbons and stationery employed are of the best quality. A good ribbon should neither be thin and short lived on the one hand, nor thick and muddy on the other. Even when new a good ribbon, assuming correct touch, will give delicate work, and it should last from 300 to 600 hours, say, on an average, 500 hours. If a ribbon supplied by a good firm gives less than 300-400 hours' work, it may be taken for granted that the operator's touch is too heavy, and an attempt should be made to lighten it. Even when a ribbon grows faint, its useful period is by no means over, since there will be still a large amount of ink on the side of the ribbon away from the paper. If the ribbon is turned, its life can, therefore, be prolonged by 30-40 per cent.

Ribbons are in different sizes and of different colours, and it is important to see that the machine is fitted with a ribbon of the right

size. A ribbon which is too wide has to be cut down, a dirty and cumbersome process, while on a ribbon which is too narrow one set of type may not strike at all. Both the ordinary non-copying ribbon and the copying ribbon for use with the letter-book can be obtained in all ordinary colours. In addition to these there is the hectograph ribbon for use with the jelly copying process; the lithograph ribbon, for making lithographic transfers for use by the printer in striking off a number of copies; and the indelible ribbon, the results of which cannot be erased from the letter book once the writing has been passed through.

A cheap typewriting paper easily rubs into holes, and shows patches wherever any erasures have been made. The best of workers make occasional mistakes, and unless good paper has been used the corrections will show. Cheap paper can, of course, be used during practice, but never on actual work.

Envelopes of ordinary shape and make, unless they are of thin paper, usually give a double impression where the paper is double, that part of the envelope upon which the gummed flap is secured. To avoid this, special typewriter envelopes, in which the whole paper surface is even and level, should be used whenever possible.

TYPEWRITING. The most obvious necessity for a person wishing to become an expert typist is practice, but no amount of practice will teach the finer shades of the work, nor will practice alone produce the high speed which may be attained by means of the best methods. The touch method increases speed enormously, because the typist does not look at the keys at all, but can keep the eyes on the copy the whole time.

In typing it is important to use all the fingers, much as in playing the piano. The position at the machine should also be much the same as that of a pianist, with the elbows on a line with the wrists. The right thumb should be used for the space bar. The touch should be even and steady, and not too heavy. A heavy touch will strike the key too sharply and cause them to cut the paper.

It is very largely by the setting out of the work that an expert typist may be known from an inexpert one. Such matters as margins, spacing, and good paragraphing make all the difference to its appearance.

Margins and Spacing. The width of the margin depends very much upon the kind of work in hand. For literary work, official reports, or legal work the margin should be wide, varying from 1½ to 2 in. Letters usually look well with a good margin, but this will vary with the taste of the person writing.

It may be laid down as a fairly safe rule that it is better to err on the side of wide spacing. Single spacing may do for long business letters, for extensive quotation in the body of another work, and for one or two similar matters; but for ordinary clearness, as required in literary work and the like, double or even treble spacing is the best.

All paragraphs should be marked or indented by taking the line several spaces inward, five being the usual distance. In official work it is well to double the space between the last line of the preceding paragraph and the new one, in other words, to miss a line. This makes for clearness and heightens the effect of the paragraph. In addition, the typist should remember to leave one

space after a comma, two after a colon or semi-colon, and three or more after a fullpoint. Long quotations, as already mentioned, may be done with single spacing. They should also be indented to add to the effect.

In numbering pages, the number may be put in the centre of the top, enclosing it either in brackets or by a dash on each side, or it may be put at the bottom of the page.

A two colour ribbon can add greatly to the finish of the completed work. The title may be underlined in red, or typed in red and underlined with the black or purple of the other half of the ribbon. Numbers look well done in red, and a red capital letter to start the matter is also effective. On the other hand, the two colour ribbon is by no means essential for ordinary work, though it may be wanted for special work, such as plays.

Duplicating. If many copies of the same manuscript are required, they may be produced either by means of carbon paper or by cutting a stencil and using one of the many duplicators on the market. The former method is simple, the number of copies done at a time depends on the sharpness of the type, the thickness of the paper, and the kind of machine. It should be possible to do at least half a dozen good copies if thin paper is used. A layer of carbon paper is placed between each sheet of typing paper, and the whole is then inserted into the machine so that the face of the carbon is away from the typist. Care should be taken to insert them evenly in order that the lower sheet should be straight.

For stencil cutting a special waxed sheet has to be procured. The ribbon is then removed and the copy typed with the bare type. This cuts the letters into the wax sheet, which can then be used as a stencil and rolled off on the duplicating machine to any quantity required.

TYPHOID FEVER. Typhoid fever, which is also known under the name of enteric, is an infectious disease that occurs mostly in the last quarter of the year. Infection may be conveyed in drinking water, milk, ice, salad, celery and other uncooked vegetables, also through oysters taken from beds that have become polluted by sewage.

The symptoms develop from two to three weeks after exposure to infection, and during that time there may be no suspicion that anything is wrong. There may be, however, constant headaches and abdominal pains, with a steadily rising temperature until the patient becomes too ill to get about.

About the seventh day the rash appears in the form of rose coloured spots on the chest or abdomen. In the second week the abdomen may be swollen and the patient lies in a semi-unconscious condition. During the third week the loss of flesh and strength is less marked in a favourable case. Convalescence should begin with the fourth week. One attack usually protects from future attacks.

Many complications may develop in typhoid. Two of the most dangerous are hæmorrhage and perforation of the bowel, which are not uncommon and occur oftenest after the second week. A warning sign of bleeding is a sudden increase of weakness or collapse, followed by a drop of several degrees in temperature.

During an epidemic or when typhoid occurs amongst people who are all using the same milk or water supply, it is only common prudence to submit to inoculation with anti-typhoid vaccine.

All drinking water and milk must be boiled, and every precaution taken to protect food from flies, which are notorious carriers of infection. Cups and dishes used by the patient should be kept in the sickroom and never used by other people.

The patient's bed linen, towels, etc., should be soaked for 24 hours in a pail con-

taining a 1 in 20 solution of carbolic acid or other disinfectant and then they should be laundered separately. The excreta of the patient should be emptied into a closed vessel half full of carbolic acid, 1 in 20, and allowed to stand for two hours before being emptied.

The nurse should scrub her hands with soap and a nail brush and soak them in a solution of one part of perchloride of mercury to 2,000 parts of water before going to her meals.

Efficient nursing is all-important, by night as well as by day. Milk should be the main food until well on into convalescence, but the patient may have as much water or fresh weak lemonade as he likes. During convalescence strict attention must be paid to diet.

After convalescence a person may continue to carry typhoid bacilli in his system. Such a carrier of the disease is a danger to the public, especially if he handles milk or other food. It is his obvious duty to refrain from handling the food or food utensils of others. See Convalescence. Fever. Infectious Disease.

TYPHUS FEVER. Typhus fever describes an acute, very contagious fever, usually coming on suddenly, causing great prostration and severe nervous symptoms, marked by reddish rash and terminating by rapid fall of the temperature (crisis). Formerly common among poorer people, it is now extremely rare. The infection of typhus fever is carried by lice.

Whenever possible, a person suffering from the disease should be taken to an isolation hospital. General treatment is set down under the headings Fever and Infectious Disease.

UKULELE, OR UKULELE. Musical instrument of the guitar family. It has a long finger board and four strings, which are plucked to provide simple folk-song accompaniment to songs. It originated in Portugal, and entered popular entertainment in the U.S.A. in the early 20th cent., after the hapa had outworn its first welcome.

UMBRELLAS AND THEIR REPAIR

Smartness and Utility Combined in This Protective Device

This article after a long and careful study of the various types of umbrellas, with the view of determining which is the best, is based on

While the choice of an umbrella may depend to some extent on the prevailing fashion, there are two factors, the ribs and the cover, which should always receive careful attention.

The size is determined by the length of the rib, which varies between 24 to 26 in. for men, 27 to 36 in. for golf or carriage umbrellas, the usual length of rib for a woman's, short-sticked or "clubby" umbrella being 18 to 20 in., and for one with a full length stick 21 to 23 in. The ribs may be of solid or split, the latter being cheaper, and of course heavier, but not always so strong. Generally it may be said that an umbrella with solid ribs is a cheap class of article. Paragon or fluted ribs are made from a strip of steel bent to a U-section, the curve of the U being arranged to come next the cover in a finished umbrella.

Five types of material are used for covering umbrellas: alpaca or dagmurs, levantines, gloras, artificial silks and mixtures, and pure silks. In addition to their bulk, alpaca, and more especially the cheaper varieties, have a coarse texture. A good gloria weaves well, but many so-called gloras, which ought to be a mixture of silk and wool, contain a large percentage of cotton. Artificial silks and mixtures have a glossy appearance, but are comparatively harsh in texture. Silk always looks better than anything else, but a mixture of silk with cotton or wool should be chosen for durability, since silk covers have generally a tendency to split.

An umbrella ought not to be kept rolled up when not in use, otherwise splits and rents

ULCER. A sore that involves the true skin or sometimes the mucous membrane is described as an ulcer. It is kept open and extends by the death of minute patches of tissue which are liquefied and removed in a discharge. Many different types of ulcer are described, but each consists of an area more or less depressed below the general surface of the skin or mucous membrane, which is known as its floor, and around this a margin, or edge. From the surface of the ulcer there exudes a discharge which may be purulent or watery and profuse or scanty, sometimes it is mixed with blood.

As regards causation, ulcers fall into three main groups, namely, those due to mechanical, chemical or septic irritation, those due to specific micro-organisms such as the tubercle bacillus and the spirochaeta of syphilis, and those due to malignant new growth.

A trophic, or perforating ulcer is one that occurs in locomotor ataxia, diabetes, or some other condition in which there is disease of nerves. An ulcer of this kind is quite painless.

The treatment of an ulcer depends on its cause. In the treatment of ulcers belonging to the first group the main considerations are rest and cleanliness, and, where necessary, the removal of any constitutional factor in so far as this is at all possible. Commonly, an ulcer can be cleaned up by applying boracic foundations. Each time the foundation is taken off the ulcer should be washed with an antiseptic solution. An alternative treatment is to apply lint saturated with boracic ointment.

To obtain healing of varicose ulcers it is necessary to support the limb by applying a pure rubber bandage, a woven elastic bandage or a crepe bandage. The pure rubber bandage is liable to cause irritation by imprisoning the sweat. A useful application for varicose ulcers is found in Unna's paste. When the ulcer has healed it may be desirable to operate for the cure of the varicose veins. See Antiseptic; Gaiter Ulcer. Varicose Vein.

are sure to result. After being out in the rain it should be allowed to stand or hang, handle downwards, until dry. If the moisture is not allowed to drain away from the ribs in this manner, rust and broken points will ultimately be the consequence.

To roll an umbrella neatly, shake out the cover, gather the ends of the ribs in the left hand, pull each fold into place, and, grasping near the bottom with the right hand, commence to roll. After fastening the elastic, roll again and pull each fold taut if any looseness collects. If the elastic is worn, replace it with 6 in. of narrow black hat elastic.

Silver and metal collars and bands are fixed to the stick by means of a mixture of weak glue and plaster of paris. A special cap-filling cement, obtainable from the wholesale manufacturer, is used for fastening on knobs and caps. A little of the cement is mixed and poured into the cap, the stick being inserted immediately, as the cement sets very rapidly. Only a little cement should be used, or the stick will not go home.

Umbrella Repairs. The two repairing operations most usually necessary are mending or changing the cover and replacing a broken rib. Neither of these operations should offer any real difficulty.

When repairing a broken rib care should be taken to see that the new rib is of the same type as the others, and that it and its stretcher are exactly the right size, otherwise it will be left projecting or will close before the rest, as the

case may be. If it is only the stretcher that is broken, a stretcher taken from a broken rib can be used to repair it. Take off the outside cap, by punching out the rivets and withdrawing it, as shown in Fig. 3, then unwire the runner and turn the umbrella inside out. Before doing this it is better to unstitch a couple of the corners from the ribs; this will guard against splitting the cover or breaking another rib. To turn the umbrella inside out, stand with it partly open, the stick passing between the left arm and the body, the inside of the cover resting against the left side, but outside the left arm, and pull with the right hand.

A rivet will be seen in the joint between the stretcher and the rib. The head of this should be filed off, and the rivet punched out, to

serve if the wood or composition cap on the lower end of a short umbrella works loose. To make a secure job of a handle it may be riveted on after the glue has set hard. The handle may be grasped in the vice, as in Fig. 1, the other end of the umbrella being supported on a block. A very fine hole, about $\frac{1}{16}$ in. diameter, is drilled through the handle and the stick; the two ends of the hole are slightly countersunk, and a small piece of brass wire which should fit nicely in the hole, is pushed through it. The two ends can then be cut off about $\frac{1}{8}$ in. from the handle on each side and riveted; any surplus that may project being filed away, as in Fig. 2. To avoid scratching the handle, a piece of card or tin should be wrapped around

in many forms of construction the ribs fit into little slots cut across the grooved ring formed on the end of the runner. The ends of the ribs have small holes through them, and if these ribs be inserted through the slots the holes will register with the groove on the runner. A wire is threaded through the holes, and the ribs are drawn into the groove on the runner, thus forming a kind of hinge pin for each of the ribs. The operation pictured in Fig. 4 is that of cutting this wire so as to release the stretcher or stay, this being the strut-like portion on the rib which connects with the runner at one end and about the middle of the length of the rib at the other. The umbrella is opened and turned inside out, using the method earlier described, and the stick and ribs are brought into line. This provides access to the top eyes, that is, the little joints in the notch near the end of the stick.

The cover is then entirely stripped from the ribs, and if the latter are rusted they may be cleaned by rubbing them with emery paper and then blacked. They should be set aside to dry thoroughly hard, and are then refixed to the top notch. This operation is illustrated in Fig. 5, and is accomplished by first arranging all the ribs so that the stays all point in one direction, and a piece of tying wire, which may be of tinned iron, is bent through the top eyes. The wire is twisted around and the ribs pushed on it until the wire is in more or less a U-shape.

The first few ribs are inserted in the notch, taking care to note that an additional small notch is generally cut at one point, and is intended for the reception of the twisted end of the tying wire. Consequently the first pair of ribs should be inserted into the slots opposite to this notch. The others are pressed into place, as shown in Fig. 5, and finally the wire is drawn tight and twisted back with a pair of pliers, the surplus being then cut off and the ends of the wire pressed into the little notch.

The ribs have now to be opened to ascertain that all the stays point towards the handle, and to ensure that none of them have been inadvertently fixed the wrong way round. If so, the process is repeated and the fault remedied, after which the runner is replaced. The muffs, that is, the little pieces of black material which are stitched to the ribs to prevent friction of the ribs wearing away the cover, are examined to see that they are in good condition, if not, they should be replaced by new ones. They may be any black material, but are preferably the special waterproof oval muffs which only require sewing in place. The method of fixing is by stitching them around the ribs.

The next step is to fit the cover, the size depending, of course, on the length of the ribs. The cover can be obtained ready made, or, if preferred, can be made up at home. Assuming the cover is bought ready for use, the stick is inserted through the hole in the centre of the cover, this being accomplished while grasping the whole of the ribs in the left hand and supporting the cover with the right. To prevent the cover from splitting, it is stitched with waxed thread around the hole where the stick comes through. The cover should be stitched in two or three places to each of the ribs in turn. It is then worked into place at the corners and seams parts and drawn to the top of the ribs by passing a thread through the cover and fastening it, passing the needle through the top eye, thus drawing the cover upward and firmly sewing it. The cover is sewn to each rib in



rivet for the new stretcher being made from a bit of spring wire. The new stretcher must be exactly the same length as the old one, and it should be fitted so that its hollow side is towards the handle when the umbrella is open. The taper cap should be replaced and carefully riveted to the stick. The same process of turning the umbrella inside out and measuring carefully must be adopted in the case of a broken rib, but here it will, in addition, be necessary to unpick the stitches on the broken rib and remove it entirely. If it is only the eye of the rib which is broken, it is only necessary to replace the top tip. The new tip is measured along the rib, the broken end cut off at the right spot, and the tip knocked on taking care not to close the eye.

If a small slit occurs in the cover, an effective method of repair is to obtain a small piece of black silk, or other material similar to the covering itself, and, after opening the umbrella, carefully stitch the patch on the inside of the cover, commencing on one side of the slit first. The slit is drawn together with a few tacking threads, and the patch neatly sewn all round. The tackings are then removed and the stitches caught together, and to the patch, with a few threads. Any damage to the fastenings of the cover at the outer ends of the ribs can be remedied with ordinary black cotton. A few turns are sewn into the cover at the point or apex, the needle is passed through the small hole or eye on the end of the rib, the cover drawn tight, and a few stitches are then passed through the eye on the cover.

When the handle breaks, its mode of repair will be determined by the material of the handle and of the stick. Many umbrellas are made with composition handles and wooden sticks, and the handle sometimes becomes loose. To refix it the end of the stick is smeared with liquid glue, and a few strands of cotton twisted round it, and the handle pushed on. The same procedure will



Umbrella. Fig. 1. Drilling a fine hole for a new rivet in the handle. Fig. 2. Filing down the rivet head, the handle being protected by a piece of cardboard. Fig. 3. Removing the tapered cap covering the ring that supports the ribs. Fig. 4. Withdrawing the tying wire. Fig. 5. Fixing the tying wire to the notch.

it immediately above the rivet, as shown. This prevents the file coming in contact with the handle.

Re-covering. In the re-covering of an umbrella several processes are involved, and the amateur may find it difficult to make an efficient job the first time, but care and a little patience will ensure a tolerably good result, as can be judged from the accompanying illustrations. The first step, as illustrated in Fig. 3, is the removal of the tapered cap covering the outside of the notch ring which supports the ribs. The stitches on half of the tips of the ribs are cut away with a sharp knife, thus releasing the cover in readiness for the next operation, which consists in removing the wire which holds the ribs to the runner, the tubular member which slips up and down the stick, shown in Fig. 4.

the same way taking care to draw it well into place before fastening the top corners.

A small rosette is sewn on the outside of the cover to protect it from the chafe of the taper cap on the outside, which is then fixed in position and secured with a couple of small pins. A rosette should also be stitched round the runner near to the ribs to prevent it chafing the fingers while opening the umbrella. The umbrella can then be tested, and if properly covered should open uniformly and conveniently. A new tassel or loop may be added if desired.

The foregoing is a general method of re-covering an umbrella, and will enable most patterns to be dealt with. Sunshades may be treated in the same way. Some particular makes of umbrellas are rather differently arranged, and may call for modification in the treatment.

The short umbrella used by women has a cap to match the handle, in wood, glass or some composition, and the stick fits into a socket formed in the cap. The cap is usually cemented on, and must be carefully loosened and eased off the stick before turning the umbrella inside out to get at the top eye. The end of the umbrella may be held in a jet of hot steam to loosen the cap, or a little of some spirit solvent might be carefully poured into the joint to dissolve the cement. Since some of the compositions used for handles and caps may be of an inflammable nature, it is necessary to use great care in applying heat to them. In fixing these fittings, the ends of the stick should be roughened to afford a grip for the cement. Should the stick fit too loosely into the socket, a few threads of cotton may be twisted round the former after coating it with cement.

UMBRELLA FERN. This is a popular name of the greenhouse fern, *Glacium*. Of slender climbing growth, it is very ornamental when trained to cover a wire trellis or ticks. The plants should be potted in a compost of loam, peat and leaf mould, with sand added freely, and they should be provided with ample drainage of clean crocks. A temperature of 50 degrees is high enough in winter, and care must be taken not to over-water them at that season. Plants may be propagated by spores, or by selected portions of creeping stems to which roots are attached.

UMBRELLA PLANT. This is the common name of an ornamental greenhouse plant, *Cyperus alternifolius*. It is easily grown in a temperature of 55 to 60 degrees if potted in sandy loam and leaf mould; the soil must be kept thoroughly moist. Propagation of the umbrella plant is effected by division or by taking off the tops of the stems and inserting them as cuttings.

UNCONSCIOUSNESS. It is very important when a person is found in a state of unconsciousness to ascertain the exact cause of his condition. Mistakes are frequently made, with serious consequences to the patient. These errors occur most commonly when the unconscious person smells of alcohol. This suggests drunkenness, but the cause may be apoplexy, a fractured skull, or some one of a dozen other abnormal conditions.

The following are the principal causes of unconsciousness: Fainting from temporary weakness of the heart; apoplexy, due usually to bleeding into the brain; epilepsy following the fits; concussion of the brain caused by a fall, etc.; compression of the brain, the result of a depressed fracture of the skull and other causes; heat stroke or the effects of cold meningitis and other forms of brain disease; asphyxia due to gas poisoning or other causes; electric shock; hysteria, in which the loss of consciousness is seldom complete; catalepsy and trance; internal poisons, as in diabetes; external poisons, such as morphia, chloral, etc.

In stupor the patient can be aroused for a moment by speaking very loudly or stimulating him in some way.

Sometimes the person appears to be unconscious when he is not so, but only in a weak and dazed condition. A simple test to apply in this case is as follows: Raise the upper eyelid by pushing up the eyebrow with the index finger. Then most gently touch the eye with the tip of the second finger. If the person is unconscious, the eye remains open; if he is not wholly unconscious, he winks more or less and the eye closes.

Treatment will depend chiefly on the cause. In ascertaining this certain observations should be made. Note any evidence of a struggle or indications of an accident. If any bottle is near the patient, this and any vomited matter should be preserved for examination by the doctor who has been summoned. It should be remembered that when the smell of alcohol is found it may only signify that the patient drank some whisky when he found a fit coming on, or that, though he had taken alcohol, even more than was good for him, the unconsciousness may really be due to fracture of the skull sustained in a fall or to some other serious cause. When ever there is the slightest doubt, the person should be treated on the assumption that he is ill.

Unless the cause is clearly known it is better to keep the patient perfectly quiet until a doctor comes, otherwise serious injury may be done by adopting wrong treatment. The clothing should be loosened, the patient made

carving a sirloin it is customary to begin with the undercut, which will often suffice for a small household, leaving the more substantial part of the sirloin to be eaten cold. Sometimes the undercut is removed before the joint is cooked and is served separately as a braised dish or grill. See Beef, Carving; Fillet; Noisette Sirloin; Steak.

UNDERLAY. This word is used for the material that is placed beneath carpets and other floor coverings to make them wear longer and to improve their feel to the feet. Felt of a coarse kind makes the best underlay for pile or hair carpets. Another underlay is felt paper, which can be obtained up to 60 in. wide. Cedar felt is a paper of this kind. It contains disintegrated cedar wood, and holds the aroma of this wood for years. It is therefore, an excellent antidote to moth. Coarse canvas makes a good underlay. A waterproof underlay, which gives a soft tread and is suitable for linoleum and other floor coverings, prevents board marks and is inexpensive. See Carpet.

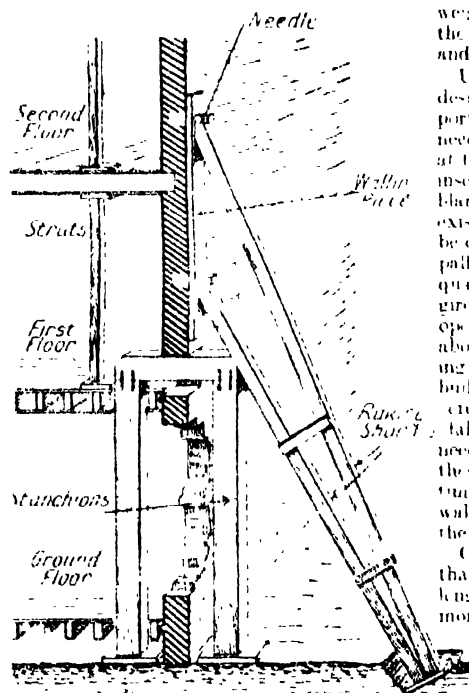
UNDERPINNING. The act of supporting a wall, the lower part or foundations of which are defective, and the building up of new solid work for the wall to rest upon is known as underpinning. Underpinning is sometimes necessary owing to the subsidence of the foundations, a common example being the failure of a bay window or other construction.

Essentially, the operation comprises the boring up of the building to prevent it falling; the provision of local supports to bear the weight of the wall above the portion affected; the removal of the old wall and foundations; and the construction of the new work.

Underpinning is resorted to also when it is desired to make some alteration to the lower portion of an existing building which would necessitate the removal of the main structure at the base. If, for example, it was desired to insert a shop front into what was originally a blank wall, or to construct a cellar under an existing building, underpinning would have to be carried out. The materials used are principally timber of rather large size and of good quality. For the insertion of a shop front a girder or bressummer is placed across the opening to carry the weight of the building above the window, and the weight of the building has to be supported while the girder is built into position. To do this it is necessary to erect a raking shore, to prevent the building falling outward, and for this also timbers are needed. Needles are first placed into the wall, these being made from pieces of 4 by 3 in. timber. They are placed in holes cut into the wall to a depth of 4 to 6 in. and project beyond the face of the wall about 9 in.

Over the needle is placed a walling piece, that is, a piece of timber 9 in. by 3 in. of the length required in the particular case. A mortise or hole is cut into this walling piece sufficient to let the needle pass through the piece, which is placed lengthways to the vertical of the wall. A notch is then taken into the needle level with the face of the walling piece placed over it. This notch receives the raking shore, which is cut so as to fit into it, and extends from the wall to a solid base in the ground. The needle is further strengthened by nailing a cleat above and against it, a cleat being a piece of wood cut out of 4 in. by 3 in. stuff and 9 to 12 in. long.

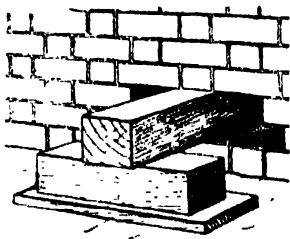
The piece of timber forming the raking shore may consist of 7 or 8 in. square stuff cut to the length required. The raking shore being firmly fixed lateral support is ensured. The number of raking shores depends upon the size of the opening that is being made, and they are spaced as stated for the needles. The interior of the building has also to be considered, and a vertical strut has to be placed between the



Underpinning. Fig. 1. General disposition of stores and struts for underpinning operations

as comfortable as possible, and covered with blankets or any warm article available. He should not be raised into a sitting posture. See Apoplexy; Artificial Respiration; Asphyxia; Brain; Bright's Disease; Catalepsy; Epilepsy; Fainting; Gas Poisoning; Heat Stroke; Poisoning; Uraemia, etc.

UNDERCUT: Of a Sirloin. The undercut or lower portion of a sirloin is also known as fillet of beef, and, while usually of small size in proportion to the upper part, it is considered by many to be the prime part of the joint. In carving, the undercut is carved vertically or at right angles to the upper part. It should always be eaten hot, and consequently in



Underpinning. Fig. 2. Method of arranging support while making alterations to damp course

to erect the underpinning proper. A sufficient number of holes are cut through the wall to allow other needles to pass through. These needles are of a larger size than those previously mentioned, not less than 9 in. square. They are put right through the wall and are supported in turn by stanchions of the same sized material as the needles, the stanchions resting on sole plates that are placed on the ground. These timbers are then wedged tightly into position, they are strutted and elevated as may be necessary, and generally arranged as shown in Fig. 1 on the previous page.

When sufficient of these for the size of the opening have been erected, the work of making the opening is proceeded with. The girder or bressummer is placed in position and built up, and, when properly set, all of the timbers erected to carry the weight are gradually removed. A similar procedure is followed in forming a cellar, but the work is rather more complicated. The large needles are placed at a height that will just clear the position into which the girder, etc., is to be placed.

A form of underpinning often necessitated by the failure of the damp-proof course consists in removing a couple of courses of brickwork from a wall, inserting the damp-proof course, and building the wall up again. Providing the wall is sound and well built and that the bricks are removed carefully, it is generally possible to carry out this work with no particular support except at such places as the brickwork beneath a window opening, or under the support of a particularly heavy part of the building. The work may be locally supported in the manner illustrated in Fig. 2, by placing a short, stout timber through the aperture and resting it upon a couple of built-up timber supports, so as to relieve the wall of some of the weight imposed upon it. See Brock, Concrete; Damp Course, House.

UNION CLOTH. Cloth made half of one material and half of another is known as union, and is usually cheaper than the goods which it imitates. Union wool cloths are partly cotton. The cotton threads are generally concealed by the woollen ones, and are ordinarily the up-and-down and not the cross-wise threads.

floor below and the ceiling above. This strut is formed of 4 by 4 in. stuff, and is so curiously wedged top and bottom.

Now it is necessary to arrange to take the weight of the wall, that is,

Union cloths are preferred for certain purposes. Union flannels, for instance, are less inclined to shrink than all wool. Union linings are neater than all-wool and warmer than all-cotton linings. Union blankets are cheaper than wool blankets, and the better qualities of union blanket are superior to the poorest of the guaranteed all-wool kind. Union linen is half cotton and usually not so strong as pure flax. Union linen is not so good for glass cloths as pure linen.

UNIVERSAL JOINT. For nearly three centuries universal joints have been occasionally used to transmit rotary movement from one shaft to another at an angle to it, but their present wide use is due to the development of the motor car industry. They have been generally employed on motor vehicles for a number of years to give flexibility to the propeller shaft by which power is transmitted from the engine and gear box to the rear or live axle, when so applied they are often termed Cardan joints and the propeller shaft is often termed a Cardan shaft.

The simple ball-and-socket joints used so largely in the steering connections and the controls of motor cars do not transmit rotation and, although they are not usually termed universal joints, an example will be described later.

The earliest universal joints were known as Hooke's joints, after their designer, and were constructed on the principle illustrated in Fig. 1. Each of the two shafts carries a fork on its end and the forks are connected by an intermediate member, in the form of

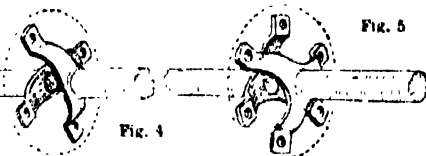


Fig. 1

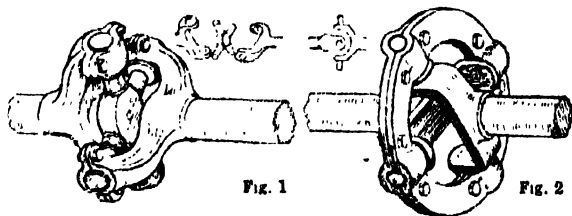


Fig. 1

Fig. 2

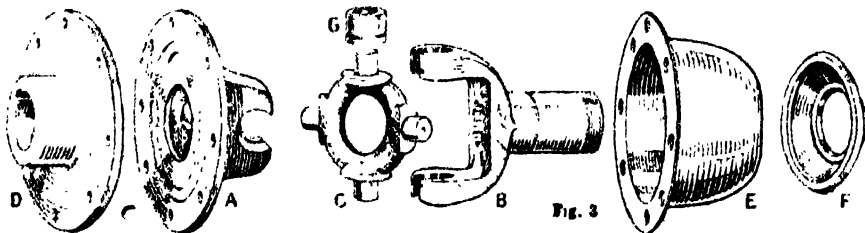


Fig. 3

Universal Joint. Figs. 1 and 2. Examples of common types of universal joint. Fig. 3. Principal component parts of a universal joint as used in the propeller shaft of a motor vehicle. For details see text. Fig. 4. Hardy disk joint. Fig. 5. Ball centre support for shaft

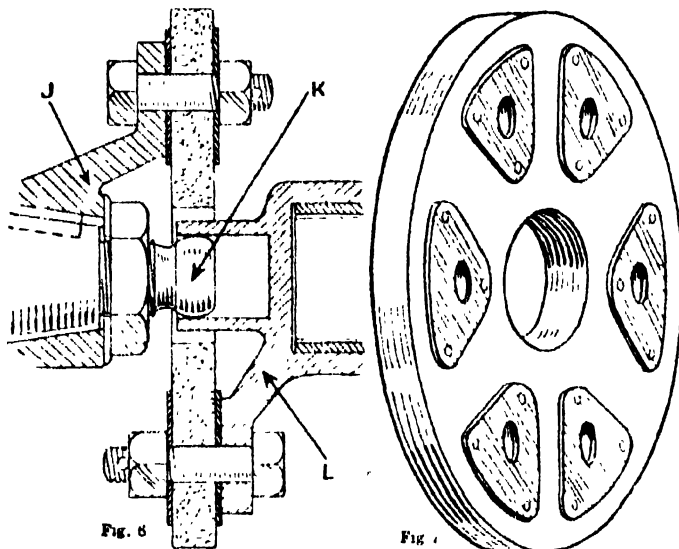


Fig. 6

Fig. 4

Fig. 6. Left, sectional view of a rubber disk type of universal joint with ball centring arrangement. Right details of the disk

lubricated, an example being afforded by the widely used Hardy-Spicer joint, the various parts of which are shown in Fig. 3, as applied at the forward end of the propeller shaft and at the rear end of the gear box.

The intermediate member, C, is pivoted both to the driven fork, B, and to the driving member, A. The latter comprises two pivot lugs on one face of an annular disk which is bolted to a disk, D, fixed to the end of the gear-box driven shaft. The driven fork is formed with a long splined boss engaging the forward end of the propeller shaft so as to allow a small amount of sliding movement which results from the up and down movements of the rear axle. The joint is enclosed in a hemispherical cover in two parts, of which one part, E, is bolted to the driving disk and the other part, F, fits on the boss of the driven fork, but is pressed up against the first part by a helical spring. The method of pivoting the intermediate member, C, to the fork and disk is interesting and ingenious. Between each pin on the member C and the open-sided hole in the other part is introduced a hard steel bush G, which is pushed into position inwards, the four bushes being held in position by spring rings and by the hemispherical cover. The bush is thus held securely in the recess in the fork.

The joint should be refilled with special non-separating grease after about every five thousand miles run.

Owing to the high speed of rotation the lubricant is impelled by centrifugal force towards the outer part of the casing close to the pivots which form the principal working parts. The pressures on the pins are very high and any shortage of lubricant may bring about excessive wear.

Other Types. Another type of universal joint which has been widely used on motor-cars employs a reinforced rubber disk or ring



fastened into a piece of material in which they are rolled when not in use. The selection should include two or three upholsterer's packing needles, which have two points, ordinary packing needles, and a regulator. The latter is a piece of steel from 6 to 18 in. long, and tapered at one end to a fine point, the other having a flattened portion. The pointed end of the regulator is inserted into the stuffing material while the operation of stitching is in progress.

The flattened end of the regulator is used in buttoned work, and also for tucking away any odd ends of stuffing or fabric. The needles should range from 4 to 12 in. in length. In difficult cases it is desirable to use a semi-circular as well as a pattern known as a spring needle. This latter type of needle is straight for some three-quarters of its length, while the remaining portion is curved. Some needles are made with bayonet-pointed ends, so as to cut cleanly through the covering material.

The amateur desirous of taking up upholstery work should start with some simple operation such as re-stuffing and re-covering a chair. Broadly speaking, there are two methods of upholstery. In one, the chair seat or other part of furniture is simply padded with some suitable stuffing and the exterior covered with the desired tapestry or other fabric. By the other method, upholsterer's springs are used to give resiliency to the seat, etc. The springs illustrated in Fig. 1 are spiral or coil springs. They are made in various sizes, and can be obtained from any furnishing ironmonger's.

Webbing is one of the most important of the materials employed. It must be made of very strong braid, and only a really good quality should be purchased. The best qualities are made of flax, and are sold in pieces about 18 yd. in length, the width varying from 1 in. to 2½ in. The webbing has to be thoroughly stretched before it is used. One method is to suspend it by looping it over

stout bars hung from the ceiling and hanging heavy weights on the lower ends of the webbing.

Hessian, a kind of canvas woven from jute or hemp, and sometimes known as spring canvas, is used for the coverings of the tops of the springs. Scrym, a light canvas with an open mesh, is employed to keep the padding on top of the springs in its proper place and shape.

Special kinds of twine are required. Fine or stitching twine should be obtained for sewing the edges of the scrym; spring twine, which is thicker, is used to fasten the springs

known as fibre, which is a species of fine cord, is often used as a substitute for horsehair, but lacks its springiness. Coconut fibre can be used for common work, also alva, which is a kind of dried seaweed. Wood-wool, composed of finely shredded shavings of wood, is extensively used, and possesses considerable springiness, besides being exceptionally clean and sanitary. Kapok (*q.v.*) can be used.

A great deal of stuffing is carried out with wool and flock, the latter being a waste product made from rag. Its manufacture is regulated by Act of Parliament, which has the effect of keeping it reasonably clean. Ordinary



Upholstery. FIG. 2. Chair, with old covering and webbing removed, ready to be re-covered. FIG. 3. The first stage, stretching and tacking down the webbing. FIG. 4. Tacking down folded end of webbing for security. FIG. 5. The seat completely webbed. FIG. 6. Tacking on first layer of canvas. FIG. 7. Showing stuffing in place and second piece of canvas being tacked over it. FIG. 8. Applying the covering

to the webbing. The stoutest material is often known as laid cord, and is used to tie the springs down to the proper size and shape. The webbing is attached to the framework by tacks, which should be of the cut or fine variety, and either brass or black enamelled. Proofed tin tacks are stouter and have larger heads. Those about ½ in. long should be used for fastening the webbing; others, from ¾ in. to 1 in., being utilized for tacking the canvas or other materials.

Materials for Stuffing. For the stuffing, nothing beats horsehair, the best being obtained from the tail and mane. In the treatment to which it is subjected it is cleansed and curled into ropes, the curl being the feature which gives horsehair its peculiar springy property. Inferior qualities are short in length and lacking in resiliency. A material

wadding is useful to the amateur for stuffing, and particularly as a covering immediately beneath the outer covering of tapestry, etc. It imparts a smoothness to the finished work. A supply of the materials mentioned can be obtained from a good-class draper's or furnishing house.

Re-upholstering a Chair. In re-upholstering an ordinary chair the old coverings and webbing are first removed. This is done by prizing out the tacks holding the gimp, tearing off the covering, removing padding and springs and finally removing the webbing by means of an old chisel and a mallet. If the chisel is pressed against the head of the tack and given a sharp blow, it will drive the tack from the wood. The chair should then be thoroughly cleaned, and, if necessary, any repolishing or staining carried out on the

framing particularly around those points adjacent to the upholstery, or where the upholstery will ultimately go. The result at this stage is illustrated in Fig. 2.

The first process in the actual re-upholstering is to take a piece of webbing, fold over the end so as to double it, and nail it to one side of the chair frame. The webbing is cut to length, which should be rather more than the width of the frame. The overhanging end of the webbing is grasped between the proping jaws of the webbing strainer and the latter pressed downward with the left hand. The webbing is then secured while it is stretched very tightly by driving a tack or two through it near to the inner edge of the framing, this operation being shown in Fig. 3. It is important to obtain the utmost leverage on the webbing so as to stretch it as tightly as possible. The overhanging part is folded back on to the top of the webbing and nailed as in Fig. 4. It should be noted that when the webbing is arranged in this way the loose end is doubled under the webbing in the first fixing, whereas the second end is finished by being doubled over and tacked down on top of the webbing.

The remainder of the webbings have now to be fixed. A common arrangement is that in Fig. 5, two webs being arranged across the chair seat from side to side and three from front to back. The webs should interlace with one piece alternately over and under the others as shown, each of these webs being



Upholstery. Fig. 9. Showing how the gimp is arranged round top of the leg and secured by covered tacks.

attached in exactly the same way as the first. A piece of the canvas has to be fastened to the framework, and old canvas may be used if it is in good enough condition. It is secured by folding the edges under and tacking it neatly to the framework, as in Fig. 6.

The seat can be padded with any of the materials mentioned. In the example in Fig. 7 ordinary flock is used. This is worked between the hands to make it even and uniform. It should be distributed over the canvas and worked into the desired curvature of the finished seat, using more flock in the centre than at the sides. After the flock has been arranged, the second canvas or scrim is laid over the flock and tacked to the edges of the framework of the chair, as shown in Fig. 7.

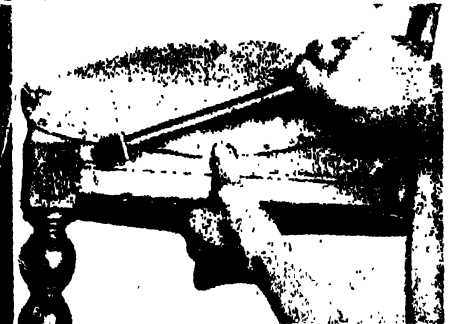
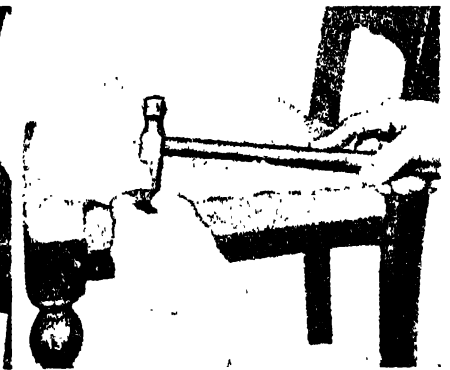
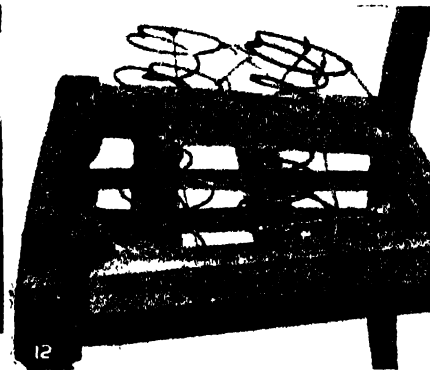
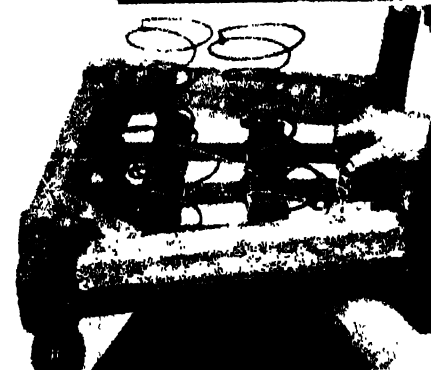
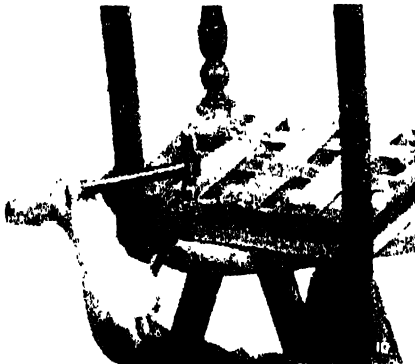
The material chosen for the covering must be cut to allow sufficient overhang on all four sides. It is then fixed to the front part of the chair frame, as in Fig. 8, by driving in a few tacks. The cover should be pleated neatly at the corners by folding the material so as to leave only one fold showing at the corner. The covering is drawn tightly and uniformly as the tacks are driven and should be neatly and carefully fitted around the tacking lines.

It is finished, as Fig. 9 shows, by trimming with gimp, secured with covered tacks. The gimp should be carefully worked all round to cover the joint between the covering and the frame of the chair, for which purpose the covering must be cut accurately.

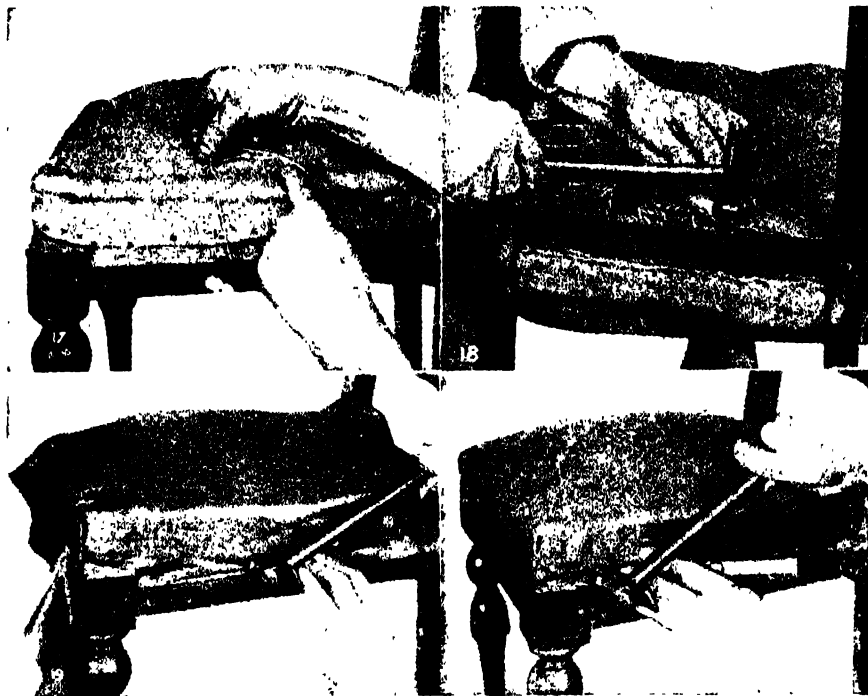
Use of Springs. The method of upholstering a chair with springs differs considerably. In this case the webbing is applied to the bottom of the frame. The chair is first prepared as already described. It is often placed upside down on a stout table or trestle, and the webbing applied to the underside of the frame, as in Fig. 10. Springs have to be sewn on to the top of the webbing. The usual plan is to employ three springs, two on the front part of the chair and one behind them centrally. They are sewn in place by stitching through the webbing in three positions for each spring, drawing the twice tightly each time and continuing from one spring to the other until this part of the work is completed. The method of stitching is explained in Fig. 11, where the fastening of the last spring is in progress. The needle is thrust through from the top of the webbing with the right hand and pressed through with the left hand and, when necessary, passed backward again from the left to the right, and so on until the fastening is quite completed.

The springs have next to be fastened with thick string or lard cord, usually in the manner illustrated in Fig. 12. The springs are secured in such a way that the strings draw them down and slightly depress them. They should be fastened in the first place to each side of the framing, the strings being attached to tacks driven into the frame itself. Another string is used to connect between the front two and the rear spring, and the latter is secured by another supporting string to the back of the frame. The object of fastening the springs in this way is to prevent them from grinding or rubbing when the chair is in use and to keep them in place while the upholstering is in progress.

The purpose of compressing the springs at the start is to ensure that they will constantly exert a pressure between the lower webbing and the underside of the covering material,



Upholstery. The various stages in upholstering a spring chair. Fig. 10. Nailing webbing to underside of seat. Fig. 11. Sewing springs to webbing. Fig. 12. Springs lashed together with thick string, and fastened to frame of seat. Fig. 13. Springs covered with canvas, which is firmly tacked down to frame. Fig. 14. Sewing the springs to the canvas covering with a spring needle and strong string. Fig. 15. Placing the stuffing over the canvas. Fig. 16. Tacking down a second covering over the stuffing.



Upholstery. Fig. 17. Showing the edges in order to form an edge or roll of stuffing. Fig. 18. Covering the underside of the chair. Fig. 19. Tacking down the material that is to be used as the final chair covering. Fig. 20. Fixing the gump in place to cover the joint.

and thereby keep the chair seat in its proper shape. The size of the springs is usually about 6 in. in length and No. 3 gauge. The height of the seat from the bottom of the frame to the top of the seat, when it is finished, should be about 31 in. If the seat is to finish 6 in. from bottom to top, it is usual to allow 14 in. for the thickness of the filling or stuffing, and therefore it is necessary to compress the springs by about 14 in.

In placing the springs the finishing end of the coils should all point in the same direction, towards the front of the seat. The springs should always rest on two webs where they overlap each other. It is also necessary to tie the springs in such a way that their upper surfaces conform generally to the curvature of the seat or other part of the chair, and the springs must always be lashed in such a way that they can exert their pressure in the same line as that of their own length, i.e. upwards and not sideways.

Covering the Springs

When the springs are fixed satisfactorily they have to be covered, in the manner shown in Fig. 13, with a piece of strong canvas. This is first fixed to the back rail with a few temporary tacks. The canvas is then held tightly and tacked to the front rail. The sides are tacked alternately: first with a tack near to the back of the chair on one side, then the canvas is pulled tight and fastened with tacks on the opposite side and so on until it is tacked all round. It must not be drawn tightly enough to depress the springs further, but should just lie evenly upon them. The tops of the springs are sewn to the canvas with a spring needle by the method illustrated in Fig. 14. The needle is passed through the canvas and each spring sewn in three places, the string being worked continuously from one spring to the other, and finished ultimately at the starting point.

The method of applying the stuffing is illustrated in Fig. 15. Whatever material is used it must be picked or teased out into a loose mass, packed on and around the canvas, and built up as nearly as possible to the desired shape of the seat. To prevent the stuffing from moving, it should be fastened with a hair tie,

which is a twine worked around the outside of the curved part of the canvas and caught to the stuffing by sewing at the corners. The string should be about 3 in. up from the frame, and there should be about 8 or 9 in. of space between each tie. This twine is left quite loose and is tightened up when all the stuffing has been worked in.

After the sides have been packed up tightly with stuffing, the centre is filled in and the whole arranged as smoothly and evenly as possible. The scrim has then to be applied to the whole so as to cover and enclose the stuffing, this operation being shown in a nearly completed stage in Fig. 16. The scrim should be of such a size as to allow for turning up on all sides. The first side to be fastened is the back, the canvas being temporarily secured with three tacks. The stuffing is lightly compressed with one hand and the scrim secured temporarily to the front rail. The scrim is an open mesh, the strands of which can quite easily be seen, and in fastening or tacking it down these strands should be kept as straight as possible. This little detail will prevent the risk of subsequent slackening, or at least minimize it.

The sides of the scrim are tacked to the frame, being turned in so as to reveal the edge. This being accomplished, the scrim has to be tied or sewn to the spring canvas with an 8 in. straight needle. This is used with a fine twine and stitches are made by thrusting the needle through from a point at a distance of a few inches from the point which will form the edge of the chair, the start being made from one back edge. The point of the needle is worked through the stuffing, and emerges through the side of the canvas. To form the edge of the seat, twine is worked in a similar manner from the upper part through the stuffing and out at the side, as in Fig. 17, and drawn tight to form an edge or roll of stuffing. It is important that the line of this work be kept of good shape, as upon that will depend the appearance of the finished chair.

Second Stuffing. When the roll or edge has been sewn in the way the chair is in the state known as first stuffing, and can be covered, if desired, without further stuffing. It is, however, an advantage to apply an additional

stuffing, which may be of horsehair, wadding, or other material. It should be sewn in such a way that the stuffing cannot shift or work up into lumps, for which reason ties made with loops of fine twine are provided. The ties are made around the seat about 2 in. from the edge, and several ties provided in the centre portion of the seat. The hair is closely worked under the ties, and when completed with horsehair the surface should appear to be covered with short, curly pieces. The corners are fitted with buckram or thin cardboard folded and tacked to the corners of the frame to give it a clearly defined shape.

They terminate a little distance below the upper surface of the stiffening, and the edges should be rounded so as not to reveal any marked angles. This second stuffing may be covered with unbleached calico, or some light material, which is temporarily tacked to the chair, the back corners being nailed and fitted in the manner already described.

It only remains to cover the underside of the chair with a lining of canvas, turning under the edges and tacking them firmly to the underside of the frame, thus covering the web completely. The manner in which this is done is illustrated in Fig. 18.

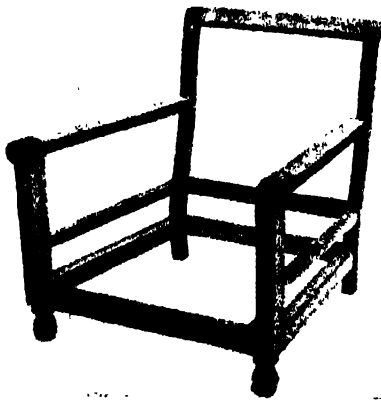
The chair is now ready for its covering, which may be of any desired material, and is applied as shown in Fig. 19. The cover is carefully tacked to the sides of the framework of the chair and neatly worked around the corners, being finished with any desired kind of gump, as in Fig. 20.

Stuff-over Work. A more ambitious undertaking is that of completely upholstering a chair from the frame and doing the work on a system usually described as stuff-over. The tough frame can be obtained ready for use or taken from an old chair which has been stripped of its stuffing. Instructions and working drawings for making a frame are given in the article on Easy Chair. The appearance of a divan chair frame is seen in Fig. 21. Fig. 22 shows the frame after being webbed and sprung.

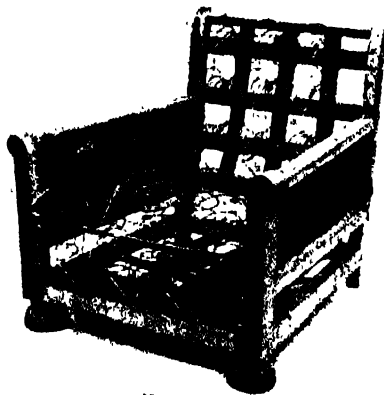
The first step is to apply the webbing to the underside of the lower framework of the seat and also to the back part of the framework and the sides. The spaces between the arms are filled in with a piece of scrim or canvas, and the springs are then sewn to the web. A stout cane or similar light, flexible bar is lashed across between the two upper portions of the upright part of the chair frame, attaching it to the springs, as in Fig. 22, and not to the framework of the chair.

The purpose of the cane is to provide a resilient edge for the seat. The method of sewing the springs of both back and seat and connecting them together with laid cord is shown in the illustration. In this type of divan chair with a spring edge the lower cross rail on the upper part of the frame, known as the front rail, is located only a few inches above the floor. The cross rail must be sufficiently wide to support the greater portion of the bottom part of the spring. Before the springs at the front are actually fitted, a piece of webbing or a double piece of canvas should be placed between them and the rail, and the end pieces attached to them to avoid any chance of their working forward. Another point is to support the middle portion or waist of the spring by lashing from back to front and from side to side with cord.

The seat is covered with spring canvas sewn together around the spring edge so as to ease or enclose it. A still better plan is to cover the springs only, and arrange a separate covering for the spring edge by working the canvas so that the pull on it when the chair is sat upon does not draw the spring edge inwards. This can be managed by temporarily fixing the canvas on the front by passing it over the spring edge, fastening it to the stuffing rails



Upholstery. Fig. 21. Frame of a divan easy chair ready for covering. Fig. 22. Chair with back and seat webbed and sprung



at the sides of the chair, then removing the temporary tacks from the front part of the canvas and folding it back along the edge of the spring edge. This portion is then fastened to the front rail with stout cord or ties, the canvas folded back again over the spring edge and tacked to the front rail. In this way a furrow is formed between the spring portion and the spring edge, which relieves the latter of the bulk of the pressure from the springs.

The chair is stuffed by the double stuffing method. The first stuffing should be with horse hair for preference, tied in the manner already described. After the seat has been stuffed it is covered with serym; the back and sides are permanently tacked, the serym being fastened at the front by means of a circular needle and nine twine. The second stuffing is then proceeded with and covered as before. The back and arms are started after the seat has been stuffed. The arms may be sprung, if desired, with springs about 4 in. long. The spring of the back of the chair should be commenced with the springs, the form being obtained by the use of those of proper length and strength. The swell at the back part should have thicker springs 6 to 8 in. long. In canvassing the back, care must be taken not to strain the fullness of the material, and to obtain neatness by folding where necessary. A few ties are worked through the stuffing at various points to keep the whole firm. The appearance of the work at this stage is seen in Fig. 23.

Applying the Cover. In the final covering the utmost care will be found necessary in planning the various pieces and if the material to be used is expensive the amateur will probably find it well to cut a set of patterns in calico or some cheap material and try them in place to see that they fit properly. This having been ascertained, the proper material can be cut. It is not necessary to allow much for overlap, as the edges of the material need only be sufficiently long to enable them to be tucked out of sight. Any fastenings that have to be made to the framework are accomplished with strips of stout calico or linen, known as stretchers, which are sewn on where needed; they serve as an extension of the covering and provide the necessary support.

When all the pieces have been prepared they should be marked for identification purposes. The whole of the seat, back, and other parts should be covered with a sheet of wadding, carefully smoothed down and trimmed at the joints. The various portions of the covering are applied, first the seat, which may be tacked temporarily in place, and then the coverings for the arms and back. Slight adjustment of the covering will ensure the design being central and

any lines uniform. The seat is tacked in position, and after it the arms and the back.

In the case of a bordered chair the covering is pinned under and sewn with the circular needle, the border being bulged with wadding and a little hair. The covering is pinned under the edge and corded wherever necessary. Any fullness should be disposed of as the work progresses, by pleating and folding. The outside pieces are then fitted. The bottom of a chair of this type is covered with linen or canvas, as shown in Fig. 24, and the chair is finished with gimp and cord. Gimp is used to outline the design and to cover any bad surface that may show. The cording is secured with a small circular needle and carpet thread. The amateur will probably find it helpful, if a corded edge is to be worked on the tapestry, to apply it first in the manner adopted for making loose covers. Some of the finishing cords and circular gimps are merely applied with tacks or sewn in place according to the nature of the materials.

Loose Seats and Frames. There are many other applications of upholstery which can be carried out in a similar manner. In some cases loose seats are used and are webbed and upholstered on an independent wood or metal frame. The general procedure is the same as has been described, except that in the case of metal frames the webbing is folded round the rod and secured by sewing. When buttons are sewn through the material to form a depression and so add to its appearance and strength, they are secured with line twice sewn with a long, fine needle, and they are sewn through the stuffing to the spring canvas. Provision for the button points must be made in the early stages of stuffing. Button work should not be undertaken by the amateur until some experience has been gained in more simple work.

Many forms of box spring mattress are upholstered in substantially the same way as a large spring seat, the underside of the frame being webbed, the springs sewn to them, and the upholstery carried out by the double stuffing method, with buttons at appropriate intervals. If any difficulty is met with in the actual covering of the chair it can often be met in the finishing stages.

Loose Covers. Detachable coverings made of printed linen, cretonne, chintz, cotton rep, or gingham are useful either to protect a delicate upholstery fabric or to cover up a shabby one. An enormous variety of patterns in modern and period designs to suit every conceivable colour scheme are available in 31 in. width, and many in 50 in. When making loose covers for settees, chesterfields and large armchairs, it is sometimes more advantageous to buy the 50 in. width if it saves extensions on either side in order

to get a whole width in the middle to balance the design. Small patterns will join more easily than those with large bunches of flowers or medallions. Plain reps are simplest to plan and cut to advantage, but somewhat dull in most rooms unless there is a good deal of colour and decoration elsewhere in the furnishing scheme.

Paper patterns should be taken of the chairs, etc., which require covers. If this is done the total length of material required can be fairly accurately estimated by planning out the patterns and measuring them. Ordinary large newspapers can be used and the type and folds of the sheets are a guide to accurate placing on the chair when taking the pattern. Accuracy in shape and fit is most important, both to appearance and durability.

The parts to be measured for an armchair or settee of the usual types are: Inner back; Outer back; Seat, front to back and the width from side to side; Inside arms; Band for front of seat to cover stuffed upholstery or frame; Two outside arms; Two small front arm pieces (not always necessary); Frill. Measure off a length twice round the bottom of the chair, if this frill is to be box pleated, $1\frac{1}{2}$ times round if to be gathered. The depth of the frill varies, but it is usually made just to clear the floor.

A narrow piece may have to be included in the parts to join the inner and outer backs so that they fit nicely at the top. If the armchair is straight this extra piece may be avoided by taking the pattern right over and cutting the inner and outer backs in one length. In some chairs with rounded tops, as in Fig. 23, the inner backs are taken over the stuffed top, and seamed over the outer edge of the top to the outer back piece.

Take a sheet of paper and pin it to the inner back. Let a fold of the paper run straight down the middle. The pattern need only be cut on one side if the paper is doubled in this way. Cut off by the seams of the upholstery, but an allowance of 6 in. for a tuck in at sides and back of the seat and of 2 in. for turnings must be allowed when cutting out the material. Next take the pattern for the outer back and then for the seat. Pin the paper from the back of the seat with a fold of the doubled paper down the middle. Cut off at sides where it touches the arm and back and at front edge. It should be noted that an allowance for the tuck in of 6 in. for both sides and for back of seat portion must be made when cutting material.

Take a pattern of one arm only, first from inside over the stuffed edge and cut off at seam. Again 6 in. will have to be allowed for the tuck in at sides in order to join the seat portion, when cutting material. Then pin the paper outside the arm and cut off the pattern by the top seam and lower edge of the chair. Pin a piece of paper to the front of

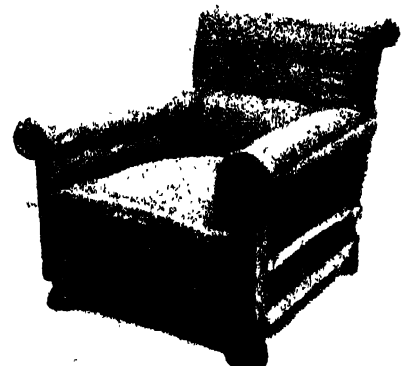


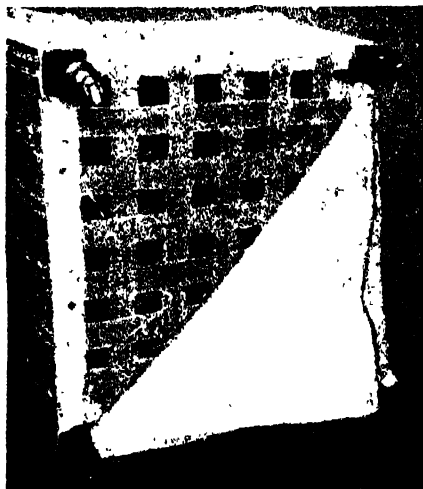
Fig. 23. Divan easy chair, stuffed and covered with canvas and requiring an outer covering of tapestry or leather or loose cover of cretonne

the arm and cut out to shape of the upholstered piece. Any fullness will have to be pleated up to fit the curve of the front arm. Next take pattern of the straight band in front of the seat which connects the two arms.

If notches are cut in the pattern pieces at connecting points it is a guide to joining them correctly. A duplicate of the right arm should be cut out in paper to avoid the danger afterwards of cutting out 2 lefts or 2 rights in the material. Mark the patterns of the arms left and right.

When making up, pin the pattern carefully on to the material, remembering to leave 2 in. or at least 1½ in. for turnings and the 6 in. for the tuck-ins where necessary. Make sure that the fabric is quite straight before cutting out. The pieces of material can be pinned on to the chair before sewing to ensure accuracy.

The seams may be bound with bias strips of the material or piped. For the latter method strips of the material cut on the cross and 1 in. wide are required. Allow an extra ½ yard for each chair, or strips of plain fabric,



Upholstery. Fig. 24. Showing how the bottom of an easy chair is covered with linen or canvas. Courtesy of Our Homes and Gardens.

such as linen or easement cloth, look well to match the ground colour of a patterned cretonne. Lay the material for the covers right side up to cut out. If a fabric with a large design has been chosen see in planning out the pattern pieces on it that the main motifs of the design are well placed to come in the centre of the inner back and seat. Also that the design matches on the arms. With a large flowered pattern it is well to allow an extra yard of material as it may cut to waste.

For bound seams (see directions for binding in page 99), the cover should be pinned up with turnings on the right side, and fitted closely on to the chair. For piped seams, the turnings are pinned up on the wrong side, and the cover should fit easily, as the piping takes up room (see page 948). All visible seams should be piped. Any fullness at curves should be neatly darted, gathered, or pleated into position.

The tuck-in seams and any others that do not require piping or binding should be machined first. An opening is left at one side of the outer back, or at both sides if the chair is large or in the case of a settee, so that the cover can easily be removed and replaced. The edge of the open seam must be faced on one side and have a wrap over to neatening on the other. Press studs of strong quality are the most convenient fasteners.

For making the frill join up the pieces and press the seams first. For a box-pleated frill

take up a 2-in. wide tuck at every 4 in. Flatten each tuck to make a box pleat (see Pleating) press, and tack into place along the top. Seam to the cover with neatened raw edge on the inside. A gathered frill is simpler to make. Having joined the pieces, divide them into even sections and gather with double cotton. Divide the edge of the cover into the same number of sections, pin together, right sides facing, and stitch.

UP JENKINS. This is a parlour game suitable either for children or for adults, the apparatus required being a sixpence and a large table. The players divide into sides, which occupy different sides of a table. One side, usually chosen by toss, has the coin to start with, and all put their hands under the table, passing the coin from one to the other. They may do this until the captain of the other side says "Up Jenkins," when they must hold their clenched hands well above the table for inspection by their opponents, taking care to wear an uncompromising expression. The person who has the coin must do all in his power to keep it concealed.

Hands may be put on the table in one or two ways, according to the opposing captain's choice. "Smash" means that they must be brought down with open palms as violently as possible; "crawl" means that they must be put down quietly, and the fingers extended slowly when they are on the table. It is then the business of the opponents to remove all hands from the table except the one containing the coin. If this is cleverly concealed between the thumb and forefinger it is very difficult to detect.

If the captain succeeds in his task, the coin then passes to his side and the game proceeds as before. If he does not, but orders off the hand containing the coin, the same side has it again. As the captain's position is one of responsibility, it is best for it to be filled by each member of the side in turn.

URAEMIA. The term of blood poisoning due to the presence in the blood of substances which ought to be excreted in the urine is called uraemia. It may occur quite suddenly, the patient sometimes becoming totally unconscious without previous warning. The condition may arise in any disease of the kidneys and in any other affections in which the urine ceases to be excreted by the kidneys. See Bright's Disease.

URIC ACID. Uric acid describes a nitrogenous substance formed in the body, partly from the wear and tear of the muscles and organs and partly from the oxidation of food. Very small quantities, in the form of sodium urate, are passed out of the body in the urine. If the urine is very acid, uric acid is deposited in crystals.

Uric acid is increased in a variety of diseased conditions, including gout, leucocythaemia, ague, and pernicious anaemia. But the importance of uric acid as a cause of disease is now considered much less than formerly. It is very slightly soluble in water, but dissolves readily in alkaline solutions. This last quality is of importance in the treatment of gout and gravel.

Some foods give rise to a good deal of the acid, while others are free from the substances out of which it is formed. This fact has led to the diet system which admits the consumption only of what are known as purin-free foods. The foods which contain in the largest quantities the bases from which uric acid is made are red meat (beef, mutton, etc.), livers, kidneys, sweetbreads, meat extracts, yolk of egg, peas, beans, and lentils, tea, coffee, and cocoa. Purin-free foods include white bread, tapioca, potatoes, cauliflower, cabbage, lettuce, rice, macaroni, nuts, among vegetable foods, apples, grapes, figs, dates, and raisins, among the fruits; milk, cream, butter, cheese, fats, white of egg, sugar, honey.



Urn. Silver tea urn, with spirit lamp beneath. Courtesy of Chapple & Mantall.

URINE. The purpose of the urine is to remove from the blood certain waste materials formed in the body. Urine is separated from the blood by the kidneys and passes to the bladder, from which under normal conditions it is discharged in average daily quantities of, roughly, 2½ pints for an adult. This may, however, vary, being increased in cold weather and diminished in hot weather, when sweating is profuse. The quantity is also greatly affected in some diseases, as is the colour.

Various causes produce pain in passing the urine. In simple cases, the eating of more vegetables and fruit may effect a cure, or a few doses of citrate of potash may be given, 20 gr. in a little water. Stoppage may be due either to the kidneys ceasing to form urine or to inability to void it from the bladder. The first is called suppression and the second retention. Urgent medical treatment is required in all cases. See Kidneys.

URN. Urns in pottery, marble, and stone are used for garden ornaments. These are of the classical vase shape with or without lids. The urn used for tea, when large quantities are required, is made in silver Sheffield plate, or in copper and various alloys, and old pieces are sought by collectors. Some are fitted with a spirit lamp for heating the tea and keeping it hot. Sometimes the urn is used for boiling water only, and the teapot is filled from it at the table.

The first urns of this kind, which appeared in England about 1740, had lamps placed under them, and the tea was made in them. This did not produce a very satisfactory tea, so an urn was made which had in its centre a vertical tube into which a round bar of hot iron was dropped, the heating being done in this way.

URNFLOWER. This greenhouse bulb belongs to the amaryllid family. The chief kind is *Urecolina pendula*, which bears drooping bunches of green and yellow flowers in June. The bulbs should be potted in autumn or in winter in a compost of loam, leaf mould and sand. Propagation is by offsets which develop on the old bulbs. When the leaves fall watering must be discontinued.

UTRICULARIA. Bladderwort is the common name of this group, which includes aquatic and insectivorous plants provided with small pitchers by means of which insects are caught. The chief species is *montana*, grown in suspended pots and baskets in a hot house in a compost of peat and moss.

UVULA. The small rounded mass of muscle covered with mucous membrane that hangs from the middle of the soft palate is called the uvula. In relaxed sore throat the uvula may elongate till it touches the upper pharynx wall or larynx, when it causes an irritating cough, especially when the patient lies down. This should be remembered when a cough is troublesome at night. Elongation, if it is slight, may be corrected by the doctor painting with glycerin of tannic acid or solution of nitrate of silver. See Pharyngitis.

UVULARIA. These are lily-like herbaceous perennials, related to Solomon's Seal. They are suitable for planting out of doors in moist soil of loam and peat in a partly shaded place, or in the bog garden. The chief kind is



Uvularia. Graceful stems and drooping yellow flowers of the species grandiflora

Uvularia grandiflora, which grows 12-18 in. high and bears yellow flowers in early summer. Propagation is carried out in spring by separating the underground stems. See Solomon's Seal.

VACCINATION. An inoculation with the liquid contents of a cowpox vesicle is used for the purpose of either preventing an attack of smallpox or of mitigating the effects of smallpox which is incubating. It produces a local pock at the site of the injection, but in the large majority of cases no general disease beyond some little feverish disturbance.

Vaccination of males is usually on the arm; for girls, it can be in the leg or buttock, to avoid disfigurement. In young children it is often extremely difficult to prevent rubbing of the skin and irritation, and this difficulty is met with whether the arm is covered or left bare. Wire protectors increase the risk of injury. A piece of boracic lint held in place with a soft bandage or adhesive plaster is the best appliance. The arm must be kept at rest as far as possible.

The best age for vaccination is before teething begins. If smallpox is prevalent the child may be vaccinated even on the first day of life. If vesicles do not appear as sometimes happens, then the vaccination is not successful, and should be repeated. Protection is said to last for 10 or 12 years in the majority of cases, but the period varies in different individuals, and may be as short as two years. It is therefore recom-

mended that a child should be re-vaccinated between the ages of 7 and 12, and that the operation should be repeated between the ages of 20 and 25.

If an epidemic of smallpox breaks out, however, it is advisable for everyone likely to be exposed to infection to be vaccinated if his previous vaccination dates back further than five years. When infection with smallpox takes place, if the patient is vaccinated within three days the attack may sometimes be entirely prevented, and if within 8 or 10 days the severity of the attack is usually diminished.

Like every medical procedure, vaccination is not free from some element of risk, but modern methods have reduced this to an almost negligible quantity. Of the milder consequences, a generalised rash resembling that of measles may appear after vaccination but is of brief duration. Septic local conditions only arise where septic methods of operation are

employed. Until 1948 it was compulsory in Britain for all children to be vaccinated before reaching the age of six months. Compulsory vaccination was repealed by the National Health Act of 1946. Local authorities may arrange with medical practitioners to vaccinate any persons who desire it. See Smallpox.

VACCINE. The name vaccine was originally applied to the substance obtained from the vesicles of cowpox. The term is now employed for any substance used for protective inoculation, and what is generally used is an emulsion of dead bacteria, of the kind which produces the disease against which protection is required. The use of such vaccines assists the natural action of the body in meeting and combating infection.

The diseases treated by vaccines, either protectively or curatively, include influenza, gonorrhoea, acne, pneumonia, tuberculosis, enteric fever, common colds, anthrax, rheumatism, and many others.

VACUUM CLEANERS

The Hygienic Method of Removing Dirt from the Home

In connection with an article on an important appliance for household cleaners the reader is referred to a booklet entitled "The Vacuum Cleaner," published by the Vacuum Cleaner Co., Ltd., 10, Abchurch Lane, London, E.C. 4.

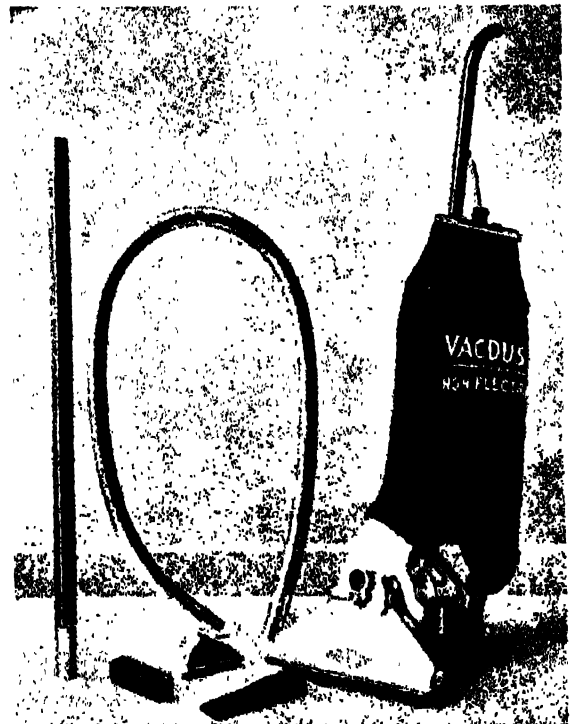
The appliance known as a vacuum cleaner is designed for extracting dirt and dust by suction. The value of any particular machine of the type is therefore chiefly in its suction powers, which must be strong enough to dislodge and extract deep-lying dirt, as well as to gather up surface dust. The powerful current of air should pass through the thickest carpet and draw out every particle of grit and dust without damaging the fabric.

The fact that the dirt thus extracted is at once drawn into the dust-bag of the machine, instead of being disturbed by sweeping with the ordinary broom or brush, when a portion of dust must be allowed to blow about the room to escape even the most careful housewife, makes the vacuum cleaner the most efficient and hygienic cleansing appliance. An additional advantage which is claimed for the best machines is that as the suction created by the vacuum is sufficiently strong to penetrate closely woven materials, a floor can be cleaned at the same time as the carpet, hangings can be rendered dust free without taking them down, and dirt can be extracted from upholstered furniture or bedding without removing the covers.

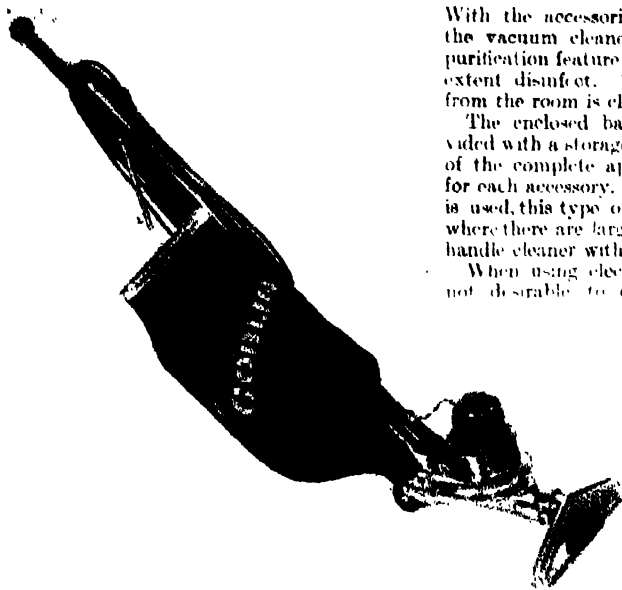
There is a great choice of these cleaners available. Improvements have rendered most of them capable of removing embedded as well as surface dirt. Also, by means of various accessories, such as special brushes for polished wood floors and linoleum, and others for ledges, different sized nozzles, including a large one for carpets, a smaller one for upholstery and in some models a bookcase nozzle, a complete house-cleaning system is devised. There are two main shapes, the handle type such as that illustrated in Figs. 1 and 2, in which the dust-bag hangs on the handle and the enclosed bag type protected by a light metal case. A variation of the latter type possesses an upright metal container and a patent hinged nozzle, as is shown in Fig. 3.

Non-Electric Cleaners. Most of the vacuum cleaners are electrically operated. Where electric current is not available a non-electric cleaner can be purchased complete with standard accessory attachments and a three years' guarantee of service. This machine is of the handle type, is built of solid aluminium castings, all parts and accessories being standardised, interchangeable and rust-proof. In its mechanism there is nothing to clip, with consequent loss of suction, because it is gear-driven on both pedal and floor motion. It is illustrated in Fig. 1.

Another make of suction cleaner for which no electric power is needed is also of the handle type, but without attachments, and can only be used for carpeted floor areas. The bellows type is suitable for small rooms with rugs and for upholstery, and there are inexpensive



Vacuum cleaner. Fig. 1. Non-electric vacuum cleaner which can be used for cleaning carpets, and also with the various attachments for cleaning furniture, walls, beds, and curtains. Courtesy of The Verduz Engineering Co., Ltd., Northampton



Vacuum Cleaner. Fig. 2. Electric vacuum cleaner with handle. By simply detaching the latter, the machine can be used in the hand for cleaning upholstered furniture, stairs and for dusting.

British Vacuum Cleaner & Engineering Co., Ltd.

cleaners of the small pump type which can be used either for floors or upholstery. Non-electric vacuum cleaners cost nothing to operate, and, in common with electric cleaners, are purchasable on deferred terms. The best makes are fully guaranteed.

Electric Types. Many of the less expensive electric cleaners of British make are excellent value. The handle type illustrated in Fig. 2 is particularly convenient for general cleaning. It may be used at its full length (as seen in the illustration) for carpets and floors, or by simply detaching the long handle the machine can be held in the hand for cleaning upholstered furniture, stairs and for general dusting. The carpet nozzle is fitted with a patent agitator device which picks up cotton and fluff quickly, as well as extracting embedded dirt. In the upholstery cleaning tool the suction is concentrated, and the nozzle reaches every corner. A floor brush is also included with the accessories for polishing plain floors. This is fitted with a buffer band to avoid damage to furniture or skirtings. The dusting brush for ledges and shelves, etc., has long bristles, and the suction behind them gathers in the disturbed dirt. The same company also makes more expensive models in the enclosed dust-bag type of cleaner.

Cleaners vary much in weight, especially those of the metal-enclosed dust-bag type. Made with a flexible hose and without a handle, such cleaners are very useful for rooms with much furniture and houses with many stairs. The light-weight models are particularly convenient for the latter, as some of the handle machines are large for placing on a step. In the case of much furniture time is saved by the use of such a cleaner as the one illustrated in Fig. 3. It is possible by means of the flexible hose to get under and round the pieces without moving them.

In a house with many delicate ornaments, carved surfaces or radiators a vacuum cleaner which possesses a blowing apparatus is advantageous. The air jet is reversed, and instead of being sucked in, the dust is blown out of such inaccessible places as the inside of a piano or behind gratings. A damp cloth should be placed to catch the dust as it is disturbed.

Two developments of interest are quietness in operation and a disinfecting pad impregnated with a pleasantly scented germicide.

With the accessories included in the outfit, the vacuum cleaners provided with this air purification feature not only clean but to some extent disinfect. The dust-laden air drawn from the room is cleaned and purified.

The enclosed bag type of cleaner is provided with a storage case for the safe retention of the complete apparatus with special clips for each accessory. Unless a separate polisher is used, this type of cleaner is not so suitable where there are large polished floor areas as a handle cleaner with polishing attachment.

When using electric vacuum cleaners it is not desirable to obtain current by means

of an adaptor inserted into a pendant lamp-holder. Plugs and sockets on the skirting board of room or staircase landing are the correct means of connection. Note the position of the wall socket for the vacuum cleaner at the foot of the stairs in Fig. 8 of the article on Staircase.

As guarantees are given with all the best makes of vacuum cleaners, no

amateur attempt should be made to repair any deficiency or breakage. Various machines depend for efficiency on proper oiling, and the housewife should thoroughly understand this at time of purchase; also the correct method for assembling and detaching the various parts and accessories.

The lubrication of the electric motor is arranged for by the manufacturers, and the grease cups require refilling only at long intervals. This job should be attended to by the makers' agent, or the local electrical engineer shop.

VACUUM FLASK. Vacuum flasks refer to those which are made with the purpose of maintaining the temperature of liquids put into them, either hot or cold. This is done by surrounding the containing vessel with an

outside shell, a space being left between, and the air eliminated from this space.

Before a vacuum flask is filled with any beverage it should be rinsed with boiling or cold water, according to the temperature of the drink to be carried. This will keep the latter cooler or hotter than it would be if poured directly into the flask. After use, the flask should be washed out with hot water and left to dry at the side of the stove. If it has held milk, the washing process should be repeated several times to prevent a sour odour from clinging to it. When the flask is not in use the cork should be removed.

Vacuum jars and jugs are purchasable in various shapes and sizes. The jars are made with wide openings to permit easy filling and cleaning, and can be used for keeping soups, stews, or any other food hot, or to maintain ice cream in a proper condition. See *Pie*.

VALANCE. The box-pleated or gathered full which surmounts the curtains of a window or other opening is called a valance. It can be fixed to a pelmet board (see page 915), or to a valance extension supplied with a gliding curtain rail.

Valances round the frame and canopy of a bed are seldom seen except on the 18th century style of bed, an example of which is illustrated in page 77. The effect of a valance is now obtained, when desirable, with a pleated full at either side of the bedspread.

VALERIAN: The Plant. Most of the valerians are of little value in the garden, but *Valeriana Phu auro* is an exception. It grows 2 ft. high, has yellow leaves and white flowers in late summer. It flourishes in ordinary garden soil. The roots of *Valeriana officinalis*, 3 ft. high, bearing rose pink flowers in summer, are of medicinal value.

Uses of the Drug. Valerian root is a drug with a characteristic, highly disagreeable smell and an unpleasant taste. It is chiefly used in medicine in the treatment of hysteria and similar nervous conditions, sometimes with striking effect.

VALLAURIS WARE. Two types of French pottery are associated with the village of Vallauris, near Cannes. One of these consists of kitchen utensils, including a porous terra cotta often covered with an opaque green glaze, with or without floral decorations.

A more important class of decorated faience comprises the majolica and lustred ware developed especially by the Massier family. Discarding the conventional shapes introduced from China, the Vallauris potter, Clement Massier, based his patterns upon the Greek vases, and decorated them in brilliant colours resembling old oriental lustre and medieval majolica.

The ware, usually a lead-glazed soft-paste, comprises ornaments covered with lustrous fish-scales, peacock feathers, etc., or with silvered lustre enriched with colour glazes.

VALLOTA. This is an alternative name for the half-hardy greenhouse or room window evergreen flowering bulb known as the Scarborough Lily. See *Scarborough Lily*.

VALSE. This is the French name for the dance more usually spoken of as a waltz. It is used considerably in music for works which are written in waltz time, such as Chopin's waltzes. See *Dancing; Waltz*.

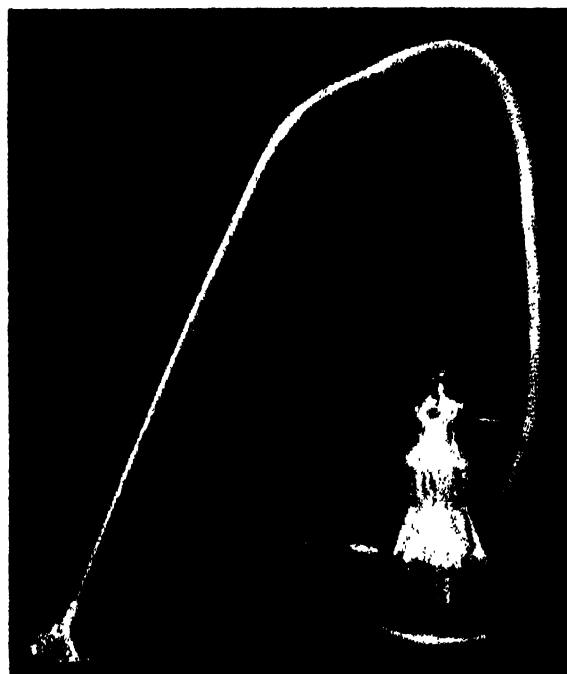


Fig. 4. In this model the usual type of dust-bag is replaced by a sanitary steel canister. Another feature which makes for efficiency is the patent hinged nozzle.

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VALVES FOR WIRELESS RECEIVERS

The Different Kinds: Their Characteristics and Uses

This contribution deals in a thorough yet concise manner with the types of thermionic valve in use. After a brief account of the basic principles upon which valves work, information is given about the various types and their function in a modern receiving set. Finally the reader is told how to select valves for given purposes, and how to read the characteristic curves which are issued by manufacturers. See Broadcast Receiving Set; Detector; Filament; Grid; Rectifier; Wireless Reception; and other relevant entries.

The thermionic valve (called vacuum tube in America) is the heart of the non-crystal radio receiver. It transforms electrical energy developed in a receiving aerial by the ether waves radiated from a broadcasting station into a form suitable for working a loudspeaker.

With modern valves there is no theoretical limit to the magnification which can be obtained. A wireless signal can be magnified hundreds of thousands of times; the practical limitation is that beyond a certain point parasitic disturbances are also magnified to such an extent as to interfere.

The first valve, devised by Andrew Fleming, was, however, only a "detector". In effect, it composed an electric light bulb with a separate plate of metal, in addition to the filament, from which a wire was led through the glass.

Fleming had made the important discovery that from a heated filament of wire enclosed in a vacuum there was "boiled off" a cloud of minute particles much smaller than atoms to which, later, the name of electrons was given. These electrons are particles of negative electricity. When, as in the Fleming valve, a plate of metal is present near the heated filament, these electrons will flow to it and form a path conducive to an electric current between the filament and this plate.

But current can pass across it only in the one direction, from filament to "plate".

Therefore, if these two electrode—filament and plate—are connected in a circuit to which is fed an alternating electric current (i.e. a current which flows first in one direction and then the other) the device acts as a *rectifier* by allowing the current to flow only the one way. In a new radio receiver this simple form of valve is now used for changing high frequency alternating current into unidirectional current

(diode detection) suitable, after amplification, for working a loudspeaker, and the supply from alternating current mains (A.C.) into direct current (D.C.) and this process is referred to as "rectification." Thus, diode detector valves and rectifier valves are direct developments of the Fleming valve.

It was subsequently discovered that if a third electrode consisting of spiral or mesh of wire were interposed between the plate and the filament, the electron stream flowing between these two electrodes could be varied in intensity by applying varying voltage to this intervening and third electrode.

It was further observed that small voltage variations applied in this manner produced relatively larger voltage variations across the filament and plate of the current flowing from a battery over the filament-plate electron "bridge." The insertion of a grid thus enabled the valve to act as an amplifier.

The grid voltage-anode current characteristic curve of a three-electrode valve is a simple graph which shows at a glance the plate (anode) current flow for a given grid voltage. It reveals that as the grid is made increasingly negative so the anode current falls.

A positive grid voltage increases the anode current. A limit is set to this increase by the "saturation point" of the valve. This is equivalent to the maximum emissions of electrons from the filament. The emission can be made greater by raising the anode supply voltage (H.T. battery or mains) but there is a practical maximum for any given valve.

Classes of Valves. Valves are divided into two main groups, battery and mains valves. Battery valves are fitted with filaments which can be heated by a 2-volt accumulator, and the current taken will vary with different types of valves from about $\frac{1}{2}$ to 4 ampere.

A copious electron emission is ensured, even

such as porcelain, from a "heater" substantially similar to one of the heating elements of an electrical fire, though it is, of course, very much smaller and is enclosed first by the porcelain (or other such material) and then the cathode. In one representative type of indirectly heated mains valve the cathode is a nickel tube coated with a mixture of barium and strontium oxides from which, at a dull red heat, a generous flow of electrons is emitted. There is no hard and fast standardization of heater voltages and currents for indirectly heated valves in wireless receivers. For ordinary sets designed to work on A.C. mains the heater voltage may be 4 or 6.3 volts and the current taken anything between 0.1 and 1 or 2 amperes.

Normally, the heaters of the valves in an A.C. set are wired in parallel and fed by a low voltage secondary winding on the mains transformer. For working on D.C. mains there used to be special D.C. valves, but universal valves (A.C./D.C. types) have now almost completely replaced them. These are mainly for use in universal sets which are able to operate D.C. or A.C. mains, have rendered the D.C. receiver obsolescent.

A.C./D.C. valves usually have 13- or 26-volt heaters which take a certain constant current. This may be, for example, 0.2 ampere. When used in a universal type of receiver the heaters are joined in series. By means of a resistance the current is then adjusted to the required constant value on either D.C. or A.C. mains.

The 13-volt A.C./D.C. valves are sometimes applied to car radio receivers, the car accumulator (12 volt) supplying the heaters which are, for this special purpose, joined in parallel. The current-adjusting resistance is not necessary in such a circumstance.

Types of Valves

There are scores of different types of valves, and every conceivable technical requirement encountered in radio receiver design can be satisfied by a valve of exactly suitable type. At first sight the characteristics of similar types in cases do not appear to reveal substantial differences, but the performance of any set cannot reach maximum efficiency unless the valves for which it was designed are used.

Diodes. These each contain only an anode and a cathode and are used either for detection or for A.C. mains current rectification. The half-wave type of rectifier is a straightforward diode of suitable design. More frequently there are two anodes in a rectifier valve in order that full-wave rectification can be carried out. That is, both the half-cycles of the A.C. supply are used instead of, as in half-wave rectification, the one half-cycle being suppressed by the "valve" action of a diode.

Triodes. These are 3-electrode valves possessing a grid either in the form of a mesh or spiral of wire interposed between the cathode and anode. Triodes can be employed as detectors (q.v.) and substantial amplification obtained by means of the reaction or "feeding-back" principle (q.v.).

Triodes are also used for magnifying impulses at low frequency subsequent to detection. Triodes are not suitable for amplification at high frequency, as they would permit an undesired reaction effect and cause instability. In order to prevent this feeding-back of energy from the anode circuit to the grid circuit (this occurs much more readily with H.F. currents), a second grid is introduced between the anode and "control" grid. Thus we have the

Tetrode or Screened Grid Valve. The "screening" grid is connected to a tapping from the H.T. supply (H.T. battery in the case of a battery set). It is, therefore, given a positive charge which assists the electron stream on its way to the anode. It does not divert it as the anode is given a still higher positive charge. By being taken direct to the H.T. supply this second grid is, from the point

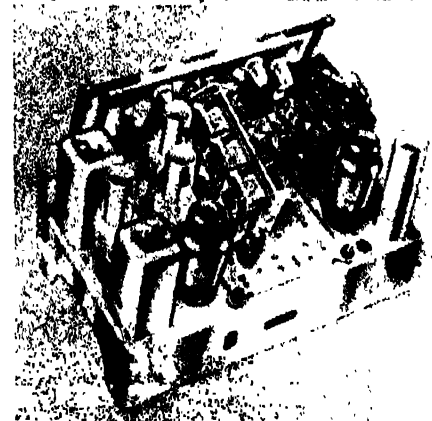
Wireless Valve. Fig. 1 (right). A range of Ferranti modern battery valves. The glass bulbs of the Screened Grid and H.F. Pentode valves are "metalized" to provide screening. Fig. 2 (below). Chassis of a modern Mains Superheterodyne set (Cosor 584), fitted with Triode-Hexode, H.F. Pentode (intermediate amplification), Double Diode Triode (detection, amplification and Automatic Volume Control), and L.F. Output Pentode.



although the filament reaches only a red heat, by the use of special metallic compounds in the manufacture of the filament.

In a mains valve the filament, or cathode as it is more correctly described, is heated either directly or indirectly by the mains current. Direct heating has, however, almost entirely disappeared, and the principle is now restricted to mains rectifiers, certain output and other valves for special purposes.

The cathode of the indirectly heated valve has no direct series connexion with the mains current. It is heated, by radiation, through an electrically insulating material



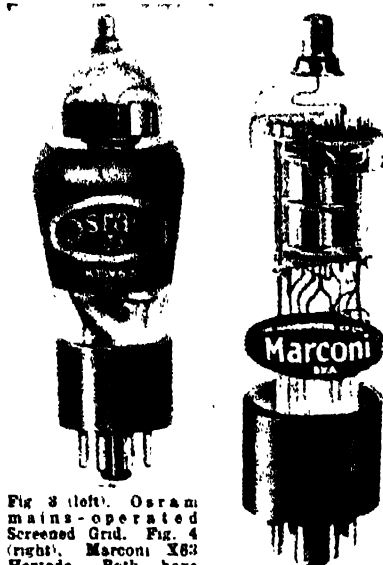


Fig. 3 (left). Osram mains-operated Screened Grid. Fig. 4 (right). Marconi X83 Heptode. Both have an Octal type base

of view of the H.F. circuits, connected to the "earth line" of the set and, therefore, neutralizes the capacity coupling that would otherwise exist between the "control" grid and the anode, and which would cause undesired feeding-back.

The Pentode. This is a development from the screen-grid valve and has a third grid which, in most cases, is connected internally to the cathode of the valve. The purpose of this "suppressor" grid is to suppress the emission of secondary electrons from the cathode. This tends to occur as a result of the bombardment of the anode by electrons from the cathode.

Variable-mu Tetrodes and Pentodes. The term "mu" (Greek μ) denotes the amplification factor of a valve. Special tetrodes and pentodes are made whose amplifying powers can be varied by applying biasing potentials to their grids. Thus the volume is controlled by adjusting the sensitivity of the receiver. As a further aid to efficient automatic volume control, "short base" variable mu tetrodes and pentodes have been introduced for use in H.F. stages. With these a very small change in the grid biasing voltage makes a big change in amplification.

Double Diode Triode. The combination of two diode and one triode valves in the same bulb with the one common cathode. It is a valve used mostly in superheterodyne types of set. One diode detects, the other is employed in the automatic volume controlling circuit, and the triode is used for L.F. amplification. The double diode pentode is similar except that instead of a triode for L.F. amplification there is a pentode section.

Class B Valve. A combination of two valves for use in the double output section of a special push-pull type of circuit for economical battery operation.

Triode pentode, triode hexode, heptode and pentagrid are combination valves acting as "oscillators" and "mixers" and, in cases, intermediate frequency amplifiers in superheterodyne receivers (q.v.).

Bases and Holders. Many different types of bases are fitted to valves. The most widely used in this country comprise groups of from 4 to 9 pins for insertion in holders of appropriate design. Normally these pins are so disposed that it is possible to insert the valve only in the correct manner. In the Octal base the pins are equally spaced, but there is a central projection from the base which has a key section to facilitate the insertion of the valve in its correctly oriented position.

Performance of Valves. The amplification factor of a valve gives its theoretical efficiency as an amplifier in that it states the ratio of anode voltage change to grid voltage change. For example, if the voltage on the grid were changed to the extent of one volt and that produced a change of 10 volts on the anode, then the amplification factor would be 10.

In practice, however, the "goodness" of a valve cannot be measured in those terms. Impedance must be taken into account. This is its internal A.C. resistance between cathode and anode under operating conditions.

The "goodness" of a valve is more definitely expressed in its mutual conductance, or "slope" as it is sometimes called. This is its rate of change in Anode Current to the change in grid voltage which produces it, the applied voltage of the anode current remaining constant. It is usually given in mA/V (milli-amperes/volts).

The superiority in performance of mains types of valves over equivalent battery valves is indicated by their greater mutual conductances. In battery valves mutual conductances of 2 and slightly over are achieved.

No valve performs its work unaided; in practice, before its performance can be assessed the practical circuit conditions associated with it must be taken into account. The term stage gain is used to denote the amplification of a single valve and its circuit is distinct from the magnification given by the valve itself. The stage gain therefore depends upon the values of the components used with the valve and the efficiency with which they perform their specific functions. It is in stage gain that the only real difference between American and British set design is evident. The American designer usually works to low stage gain. He prefers to have a larger number of valves each giving a comparatively low magnification. The tendency in British design always has been to obtain the utmost efficiency from each valve.

That is why in the U.S. 12 and 15-valve sets were once common, and sometimes standard American radio receivers had as many as 20 valves, whereas 4 represents the average number of valves per set in this country. This does not apply to television sets, for which designers are forced to employ a plurality of valves to deal with both vision and sound and the various time base circuits for building up pictures. The number of valves in a set can be reduced by using multi-purpose valves.

The factors directly governing the suitability of any valve in a particular stage in a receiver are its impedance and its input limitations. Clearly it must be able to handle, without "overloading," the maximum energy passed on to it from the preceding stage.

Its impedance should be such that it suitably adapts itself to that section of the circuit with which its anode is associated. It is generally desirable that valves used for H.F. amplification should possess very high impedances, so that the least possible damping of the H.F. circuits occurs. An H.F. screened grid or pentode valve may have an imped-

ance of as much as one million ohms. Ordinary triode detector valves normally possess impedances of from ten to twenty thousand ohms. It is especially important that the last or output valve of a set should be "matched" with the loudspeaker if the power output and quality are to be as high as possible. Valve makers generally give the "optimum loads" in ohms for their output valves. The "optimum load" is the exact impedance that the output circuit should have in order that the maximum undistorted output can be given.

The operating conditions demanded by a valve before it will function correctly are that its grid should be biased and a voltage impressed upon its anode in strict accordance with the valve-maker's instructions. The biasing of the grid is particularly important in regard to battery valves used as low-frequency amplifiers. It sets the anode current for a given high-tension anode voltage at the most economical and efficient value. Divergences in either anode voltages or grid-bias voltages can result in an undue consumption of H.T. voltage, reduced amplifying effectiveness and distortion.

Valve Troubles. One of the commonest sources of trouble is the loosening of a valve in its holder or the pins of a valve becoming dirty and making bad contact with the holder socket. Severe crackling disturbances or a complete breakdown of reception can result through these easily rectified faults. A general decline in the performance of a set, or marked distortion, may be due to one or more of the valves losing emission. A valve should be replaced when its anode current for a given anode voltage and grid voltage falls by more than 25%. As listeners are not usually able to test their valves for emission they are advised to hand them to a radio dealer for this purpose if they suspect them of having aged in this way. Most radio dealers offer a free valve-testing service.

During the first hundred hours of use the efficiency of some valves may actually tend to increase. This is because a valve works best in a very high vacuum. The degree of vacuum may rise during a valve's first period of life. A falling off of vacuum is, however, to be expected owing to grid emission as the device ages.

Distortion will occur if any one or more of the valves used in a set is overloaded. Overloading is less likely to occur in a set fitted with automatic volume control so long as none of the valves has lost its emission or is incorrectly biased.

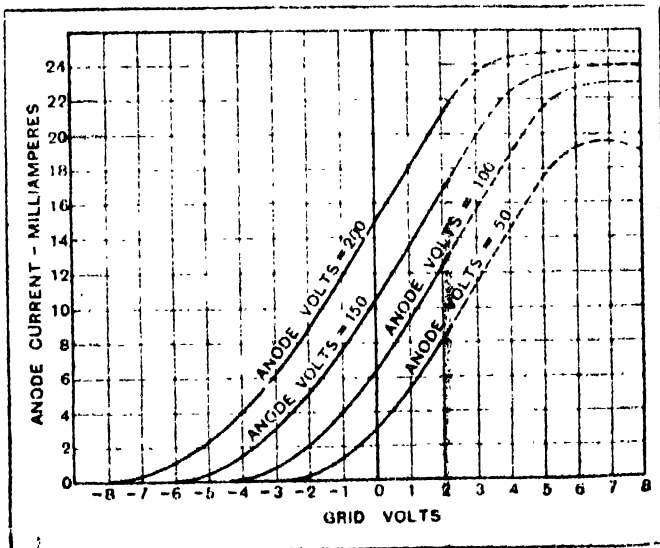


Fig. 5. Graph showing the grid volts and anode current curve (Courtesy of "The Wireless World")

VALVES IN MOTOR VEHICLES

Practical Information About the Different Types

This is one of a group of articles in our work which deals with various parts of the motor car. The reader is therefore referred to such letters as Exhaust; Four-stroke; Internal Combustion Engine; Motor Car. See also Pump

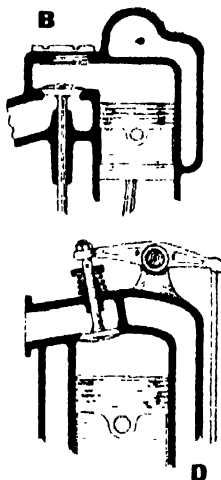
The flow of a liquid or gas through a port or opening is always controlled by a valve, of which many types are in use. To the motorist the inlet and exhaust valves, which control the working of the engine cylinders, are probably the most important and certainly call for most care and attention. Other valves, though essential, so seldom even require inspection that their presence is apt to be overlooked. Among these may be mentioned tire valves, the carburettor throttle valve and needle valve, the valves in the Autovac or in the fuel pump, and ball and similar one way or non return valves used in the engine lubrication system, in tire pumps, in grease nipples, and in the grease gun. Only engine valves and tire valves will here be considered in detail.

When the internal combustion engine was first applied to the propulsion of vehicles, experiments were made with valves of various types, but only the sleeve valve and the ordinary lift valve now survive.

The usual conical lift valves, known also as mushroom or poppet valves, consist of a head with a narrow conical face and a stem working in a guide. The head and the stem merge into one another with a good radius to facilitate the flow of the gases and to avoid the possibility of the stem breaking off under the head.

The several ways in which the valves may be arranged in relation to the engine cylinder are shown diagrammatically in Fig. 1. The side valve engine shown at B is to-day used as widely as the overhead valve type shown at C and D. In the former, the combustion chamber extends from the cylinder over the

levers, mounted side by side on a fixed shaft, each being operated from a separate cam. The camshaft is some way above the crankshaft, from which it has to be driven at half speed, various methods of driving



Valve. Fig. 1. Diagram showing various methods in which valves may be arranged. B, popular L-head or side-by-side arrangement. C and D, two types of overhead valve design.

against a flange on the lower end of the valve stem by the cam. The valve is raised from its seat, when required, by the cam. The cam engages the lower end of the sliding tappet *c* the upper end of which lifts the valve. In some constructions the lower end of the tappet carries a roller which runs on the camshaft, but more frequently it is provided with a disk shaped end, as shown. The tappet is free to rotate so that wear is distributed all over the face of the disk. A stem *d* may be screwed into and out of the upper end of the tappet in order to vary the clearance between the head of this screw and the lower end of the valve stem.

The screw, after it has been adjusted, is secured in position by a locknut. A small but definite clearance must always be left to ensure that the valve can engage its seat properly, except when it is lifted by the cam. The tappet should always be set to give the clearance specified by the makers. In side valve engines this is usually of the order of .001 in., when the engine is cold. Greater clearance will create noise and may, if excessive, cause wear and affect the running of the engine. A smaller clearance will probably, when the engine is hot, result in the valve not seating properly, and in that case there will be some loss of power, while the valve face and the valve seat will certainly be damaged by the leakage past them of the flaming gases.

The recesses in the cylinder casting in which the springs and the upper ends of the

tappets work are closed by covers *h* which serve to reduce noise, to keep out dust, and to prevent splashing of oil.

Valves were at one time made with cast iron heads into which steel stems were screwed, for the reason that cast iron withstands the destructive effect of the flaming exhaust gases better than ordinary steel. All valves are, however, now constructed with the body and head in one, from special alloy steel adapted to resist corrosion.

The helical spring work under very severe conditions, since they have to be designed to fit into a very limited space and consequently have a smaller factor of safety than is desirable; that is to say, the load to which they are subjected is too near the breaking load. This may result in their failure by fatigue, due to the many millions of times they are compressed, even though their working load is well below their customary breaking load. Special alloy steels having fatigue-resisting properties are therefore employed for valve springs.

A section through an engine in which overhead valves are operated by push rods is shown in Fig. 3, one valve only being shown. The combustion chamber *a* is in this case formed as a recess in the detachable cylinder head and the inverted valves are raised up on to their seats each by a spring *b*. The train of mechanism between the camshaft and the valve includes a sliding tappet *c*, a push rod *d*, and a rocking lever *e*, pivoted at or about its centre. The push rod is tubular for lightness and it operates the rocking lever *e* through a ball-and-socket joint, which allows freedom of movement. The ball is carried on the end of a screw, by means of which the valve or tappet clearance may be adjusted, the screw being then clamped in position, or held by a lock nut as shown. The valve or tappet clearances necessary in overhead valve engines are generally slightly

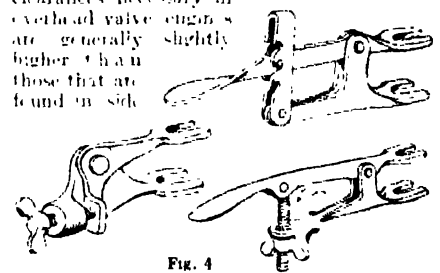


Fig. 4

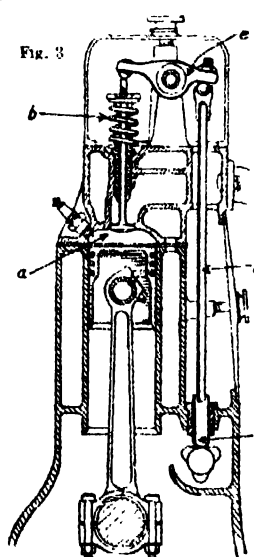


Fig. 3

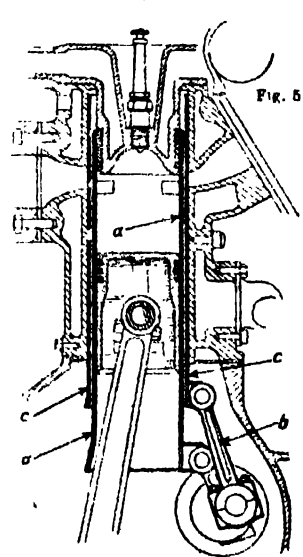


Fig. 5

Fig. 3. Overhead valve engine with push-rod operation. Fig. 4. Three types of valve lifters that may be set and left unattended. Fig. 5. Double sleeve valve Daimler engine; in which inlet and exhaust ports are opened and closed by sleeves.

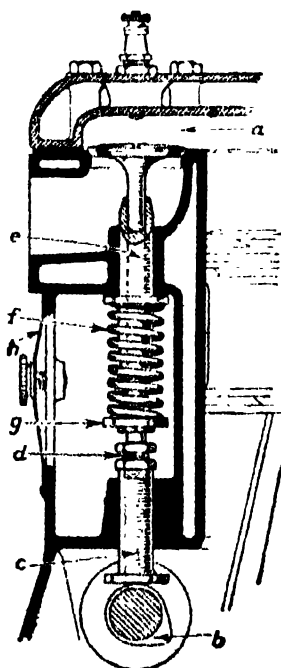


Fig. 2. Arrangement with sliding tappet in side valve engine.

valve engines. The push rods pass with complete freedom through openings in the detachable head. The rocking levers are in nearly all cases lubricated automatically and the operating gear is protected by a cover, but it is well with many engines occasionally to remove the cover and use the oil can to ensure that some oil reaches all the working parts such as valve stems and the ends of rocking levers.

Whenever an engine is decarbonized it is desirable that the valves should be ground in until all marks are removed. If this operation is neglected there is considerable risk that the putting marks will penetrate somewhat deeply and that a considerable amount of metal will have to be removed at a later stage when truing up the valves. In order to detach the valve it is necessary first to compress the valve spring and collar or washer so that the cotter pin or similar securing device may be removed from the stem, after which the valve may be removed. The spring is in nearly all cases too stiff to be compressed by the fingers and a proper valve lifter or valve spring compressor saves a great deal of time. Many different designs of valve lifter are available for this purpose; examples being shown in Fig. 4. The valve should be down on its seat before the valve lifter is brought into use, and the forked end of the lever should be placed squarely in position under the spring collar to avoid the valve rising with the spring when it is compressed. The collar when lifted clear allows the cotter pin to be readily removed. The valve and lifter may then be taken out together or the spring may be released, but this should always be done gradually.

Sleeve Valve Engines

The sudden and jerky operation of the ordinary lift valve has stimulated attempts to replace it by valves having a more continuous movement, but practically the only successful alternative is the sleeve valve.

A section through a Daimler double sleeve engine is shown in Fig. 5. In this construction the piston moves up and down within a thin steel sleeve or tube *a*, which is also given a short vertical travel by a rod connected to a small crank on a shaft driven at half-engine speed. Between the inner sleeve *a* and the main cylinder casting is interposed an additional sleeve *c* which is similarly reciprocated by a connecting rod *b* from the half-time shaft. The up and down movements of the two sleeves are out of phase, but they co-operate to ensure quick opening and closing of the ports connecting the cylinder to the inlet and the exhaust passages.

Sleeve valve engines are very silent in operation and valve grinding and valve adjustments are quite unnecessary. The rate of oil consumption is, however, somewhat higher than in poppet valve engines, this being indicated, particularly when starting, by blue smoke from the exhaust.

In single sleeve valve engines the sleeve is interposed between the piston and the cylinder casting. It receives an elliptical movement, being operated at half engine speed from a crank in such a way that it is moved both up and down and is given a small amount of rotation.

Tire Valves. Valves used for tire inflation are always of the non-return type, and since there must be no air leakage, although the pressure may be considerable, a rubber seal or seat is always used. In the ordinary cycle type construction shown in Fig. 6 the stem which projects inwards is covered by a short length of thin rubber tube. When the valve cap is removed air may be forced upwards through the centre of the stem and then sideways through a small hole which opens against the inside of the rubber tube. The tube is thereby lifted and air flows into the tire but

the tube prevents any return of air through the stem.

On motor car and motor cycle tires the Schrader valve shown in Fig. 7 is generally employed. The valve and its seat are shown separately at A and form a complete unit, which may be screwed into the stem *b* when the cap *c* is removed by means of a slot *d*, in the head of the cap. The two main parts of the valve unit include (1) a screw *e*, and a conical rubber plug *f*, which engages a conical seat in the

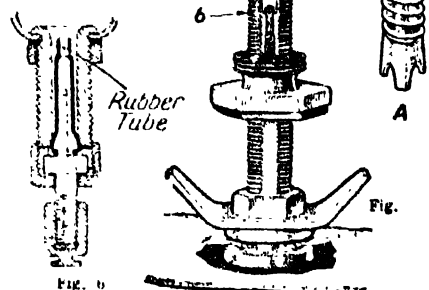


Fig. 6. Showing construction of a cycle type valve. Fig. 7. Schrader tire valve; valve unit shown separately at A, is readily removable.

stem, and (2) a metal ring *g* enclosing a rubber valve *h*, which bears on the metal seat *i*. The parts *g* and *h* are secured to a wire stem running from end to end with some clearance where it passes through the part *e, f, g*. The valve *h* is forced on to its seat *i* by the pressure in the tire, but is lifted off during inflation by air forced through the space between the stem *k*, the screw *e*, and plug *f*. These valves are practically impossible to repair, and on the rare occasions when trouble develops new ones should be fitted.

VANILLA : The Plant. The vanilla is a Lethouse climbing orchid, which may be grown in pots in the hothouse and trained up the rafters. The flowers are borne in summer, and are followed by seed pods, which are from 4 in. to 6 in. in length. Water freely during the hot months, but only occasionally during the cold weather.

The vanilla plant grows best in a mixture of peat and sphagnum moss, and the pots or pans should be well drained with clean crocks. See Orchid.

VANILLA : The Flavouring. The dried pods of the vanilla plant, which are used in cookery and confectionery as a flavouring, are about 7 in. long and dark brown in colour, the best qualities being nearly black. A small piece of the dried pod, or bean, as it is often called, if broken off and added to milk or cream imparts a delicate aromatic flavour.

The extract is commonly used for household purposes, but, although more convenient, it does not possess the same qualities for flavouring that belong to the bean itself. The housewife should carefully avoid all cheap extracts of vanilla, as they have not the true vanilla flavour. Vanilla is a favourite flavouring for ices, custards, blancmange, caramels and other sweets, biscuits, and small fancy cakes.

Vanilla Sauce. To $\frac{1}{2}$ pt. white foundation sauce add 2 teaspoonfuls castor sugar. After cooking the sauce, as described in the article under that heading, add vanilla essence to taste, and serve in a hot tureen.

Vanilla Shape. An inexpensive and quickly prepared sweet, this is made in the follow-

ing way. Heat up 1 pt. milk, dissolve in it $\frac{1}{4}$ oz. sheet gelatine, and then add the beaten yolks of two eggs and sugar and vanilla flavouring to taste. The milk must not be boiling otherwise the eggs will curdle. Lastly, beat in the stiffly whipped white of egg and the strained juice of a lemon pour the whole into a fancy mould previously rinsed with cold water, and leave it to set. When firm, turn it out and serve it with thick cold custard or whipped cream.

Vanilla Wafer. Sieve $\frac{1}{2}$ lb. flour and $\frac{1}{2}$ teaspoonful salt into a basin and make a well in the centre. Beat up the yolks of 2 eggs, add to them 1 teaspoonful cold water, and then pour them into the centre of the flour, working in as much of the latter as the eggs will take up. Then add gradually enough water to mix the whole to a stiff dough, turn the batter on to a floured board, and knead it for about 10 min. or until the dough is smooth and soft.

Roll it out very thinly, stamp it into rounds or fancy shapes, and bake these in a hot oven on a slightly floured baking-tin for 5 to 8 min. or until they are yellowish-brown in colour. When they are done, brush them over with the whipped white of egg, dip them in powdered icing sugar, and put them back into the oven for 2 or 3 min. when they will be ready to serve.

VANISHING CREAM. Unlike cold cream and other similar toilet preparations, vanishing cream is non-greasy, and is used by many women as a basis for face powder.

VAPORIZER. The appliance known as a vaporizer is used for converting a combustible liquid into a gaseous state. In its domestic applications the vaporizer is limited chiefly to apparatus for generating light or heat. The usual plan is to force a small quantity of the liquid through a restricted space, as, for example, a fine bore tube, or block of metal with small-sized holes through it, which has been heated to a sufficiently high temperature to convert the liquid into gas.

Another plan is to force the liquid through a spiral tube on to a revolving vane, which, by distributing it over a large area, breaks it up into fine particles, forming a gaseous mixture when air is added. By a third method the liquid is allowed to flow by gravity into a chamber, the lower portion of which is filled with absorbent material, such as asbestos wick or some special form of porous brick. This becomes moistened with the liquid, which on exposure to the air is given off as vapour.

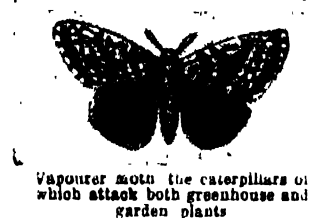
The name vaporizer is also given to an arrangement of various kinds for producing a fine spray of some liquid. See Blow Lamp, Cooker, Lamp, Oil Sprayer.

VAPOUR BATH. In chills, incoming colds, rheumatism, certain diseases of the kidneys, and other conditions for which it is desirable to produce free perspiration, vapour baths may be used for the purpose. Some skin diseases, such as psoriasis, and types of eczema may also be benefited by a course of these baths. As they are, however, very depressing in their effect, no person who has a weak heart should take them without medical advice.

A simple arrangement for taking a hot vapour bath at home is to sit on a wooden chair placed over a large pan containing a few inches of hot water. Blankets should then be draped over the body, chair, and pan in the form of a tent, the body acting as the tent pole. Someone should then lift up one corner of the blanket and place in the hot water (by the aid of some fire-tongs) a brick which has been heated in the fire. As the steam from the first brick subsides another may be added, until, after about 10 min., a profuse perspiration breaks out. This may be followed by a cold plunge. See Turkish Bath.

VAPOURER MOTH. The caterpillars of this moth attack the foliage of a great variety of plants, including most of the fruit trees, and a large variety of other trees. They also devour herbaceous plants in garden and greenhouse and may be described as general feeders.

The following method of dealing with this pest is in Leaflet 25, issued by the Ministry of Agriculture.



Vapourer moth caterpillars which attack both greenhouse and garden plants

The caterpillars with eggs may be destroyed during the winter. The caterpillars which are conspicuous may be dealt with by hand picking if spraying is not desirable, or shaken off the tree and destroyed from May to September.

Attacked plants may be sprayed with lead arsenate to poison the foliage on which the caterpillars are feeding. The formula is 4 lb. of lead arsenate paste dissolved in 10 to 12 gallons of water. The females being wingless and moving very little, the species can only spread in the caterpillar stage. See Fruit, Insecticide; Pear, Spraying.

VARICOSE VEIN. From a variety of causes veins often become dilated and tortuous, when they are said to be varicose. The most common site is in the legs. Policemen, shop assistants, washerwomen, and others whose work involves standing for most of the day are the principal victims. Tight garters and constipation, when frequent and prolonged, may have the same result. Thrombosis, that is the formation of a blood-clot which results from inflammation of the vein, may sometimes block the vessel and cause dilatation of the veins below. Pregnancy and polypus tumours are other causes. Once the swelling begins it tends to increase. Ulcers may develop and be very difficult to heal.

Garters should never be worn in any circumstances. Constipation should be prevented. Long standing must be avoided, and in the evening or at intervals during the day it is well to sit or lie on a couch and raise the legs. Exercise is necessary, but should be moderate. Cycling is one of the best forms, and some people find improvement follows dancing if not varied to excess.

So long as the veins do not give trouble or increase much in size nothing more may be necessary. Very often, however, some support is needed. If an elastic stocking is worn it should be of a good quality and a perfect fit. When bandages are used, the patient must learn to apply them properly. Any support, whether stocking or bandage, should be put on before getting out of bed and only removed at night while lying down in bed.

When the veins become painful, when ulceration or eczema is likely to ensue, or when the veins adhere to the skin and the risk of rupture arises, a radical cure should be sought. This may be procured by operation, but most people prefer to have their veins treated with injections of sodium salicylate or some other substance that produces a firm clot and thus closes it. See Elastic Stocking; Thrombosis; Ulcer.

VARIATION: In Plants. There are many variegated or coloured-leaved varieties of various shrubs and plants which normally have green leaves. The leaf colouring is usually white and green, yellow and green or cream and green, though there is a purplish tinge in some. Familiar examples are the variegated *aspidistra*, *euonymus*, *privet*, *india rubber plant* and *tradescantia*. The leaves are liable to lose their colouring if the plants are grown in rich soil. See India-rubber Plant.

VARNISH AND VARNISHING

How the Amateur Can Obtain the Best Results

In this contribution, after an account of the kinds of varnish suitable for home use, the process of varnishing is described. All the information will be found in the entries on the woods, fixtures and pieces of furniture that are varnished, e.g. Door, Floor, Oak Table. See also Brush, Easel, Paint, Sprayer, Stain.

Varnish is a transparent liquid used to form a protective coating with a glossy finish on woodwork and other material. It is applied with a brush or sometimes a spray, and after the lapse of a period varying in length according to the nature of the ingredients the varnish dries, leaving a hard and glass-like skin on the surface.

Generally speaking, varnishes are composed of oil, alcohol or water into which are dissolved various gums, resins, or colouring substances. Oil varnishes are the best for most house decoration. Spirit varnishes are employed for floors and margins, and are quicker in drying. Both kinds may be obtained ready made, and the best quality should always be used. Cheap varnishes are composed of poor ingredients, which not only render them difficult of application and cause an uneven and streaky finish, but make the work liable to such blemishes as bloom and a tendency to remain wet.

Varnishes for household use comprise inside and outside. The latter variety is more suited to withstand the effects of the atmosphere, and it may also be used for interior work. Inside varnish should never be used for work out of doors, as it is not only inferior in waterproof qualities, but is apt to peel off when exposed to sunlight. A better class of varnish for outside work where a very good quality of finish is necessary is that known as carriage varnish. These varieties are all made in various shades—white, light or dark oak, pale and dark, the two latter referring to carriage varnish. It is not advisable to apply two consecutive coats of varnishes made by different makers or of a different nature as in the process of drying one may contract more than the other and so cause the surface to crack and exhibit other blemishes.

To apply varnish successfully requires some experience. This can be obtained by experimenting and it is advisable for the amateur, before commencing any serious work to practise on spare pieces of wood. A suitable class of varnish should be selected in accordance with the nature of the work and the position in which it will be exposed.

The Necessary Materials. The materials required are, firstly, two good camel or hog's hair brushes, one of these being wide and flat for wide surfaces, and the other rather smaller for working in corners, etc. The brushes should be kept with the hair in either varnish

or linseed oil and on no account should the varnish be allowed to harden on the bristles. A jar can be used specially for the purpose of storing them, partially filled with oil or varnish. The cork should be a good fit, and have two holes cut through the centre large enough for the brush handles to pass through and tight enough to prevent them dropping right through into the jar. If necessary, a nail may be put loosely through the handle in order to hold the brush. The bristles only should be submerged, and it is a bad practice in all phases of the work to allow the handles to become covered with the varnish. If oil is used to keep the brushes in they should be thoroughly cleansed of the oil before use.

Two other requirements are glass paper and a felting pad, these being used for rubbing the work down between the coats. The pad consists simply of a piece of felt, and if desired may be mounted on a wooden base, the method of using it is described later. Pumice powder, for use in conjunction with the felting pad, is also needed. Apart from the bottle or can in which the varnish is stored, an open vessel is required in which to pour the varnish during the actual operation.

For indoor work the chief thing to guard against is a draught. The temperature should be moderate and consistent, and in cases where an open door or window causing a draught is unavoidable a good plan is to use a screen. Another danger to be avoided is dust which once it clings to wet varnish cannot be removed. In many cases it is necessary to rub the work down with glass paper before varnishing, and it is essential that the dust caused thereby be allowed to settle and be removed from the work before commencing to varnish.

The Processes Described. When new wood is to be varnished it is first necessary to prepare the surface with size, to prevent the wood from soaking up the varnish and thereby causing it to become blotchy and uneven. If the wood is not stained it should be first glass papered flat and smooth. Size should then be applied with a brush. If the wood is of a coarse, open nature the size should be rather thicker, and when the whole surface has been coated it should be allowed to dry thoroughly. Care must be taken to prevent the size running into quirks and corners and accumulating, these parts being brushed out with a fairly dry brush.

A small quantity of varnish is poured into the open vessel, just sufficient for the immediate portion of the work to be covered. It is inadvisable to pour out too much as it is liable to thicken, owing to evaporation.

Varnishing a Door. To get the best results a job like the varnishing of an outer door should be done at a time when there is the least likelihood of dust or disturbance. Probably the early morning would be chosen for the work. After removing any dust and rubbing down any parts which require



Varnishing a Door. Fig. 1. Working the first coat on the panels with a flat brush. Fig. 2. Using the felting pad between the two coats of varnish. The motion of the hand should be circular.

such treatment, the application of the varnish may be commenced.

The brush is dipped into the varnish to about one-third the length of the bristles and applied straight to the door. A surplus should be avoided so that the brush does not drip. It is worked in the same direction as the grain of the wood with a light pressure, then crosswise once, and finally with single strokes with the grain. It is necessary to work smartly, as the varnish sets fairly quickly. The object in view is to obtain a flat surface free from brush marks. Experience will soon show the worker just how much the varnish may be worked.

As shown in Fig. 1, the panelled portions of the door are varnished first, taking care to work well into the corners and edges. The varnish should be applied in a fat body, but great care must be exercised to avoid running. Having completed the recessed part the rails and stiles are next attended to. The stiles are first varnished, and the rails last, so that the joints are cleanly finished off. If, on a similar door, mouldings are present, these should be picked in lastly with the smaller brush, being careful to avoid touching the panels or stiles, and working the varnish well out of the corners. The whole should then be left to dry thoroughly.

The same process is adopted when varnishing all kinds of panelled work, working the panels first, then the rails, stiles, and finishing with the mouldings. All the joints in the woodwork should be cleanly finished, so that the brush is always drawn in the same direction as the grain of the wood. The time for drying varies, according to the varnish used and the atmospheric conditions, and this can only be decided by the conditions under which the amateur is working.

Rubbing Down. When thoroughly dry the whole should be rubbed down with the felted pad. This is done by damping the work slightly with a sponge, dipping the felted pad into the pumice powder, and rubbing it on the surface with a circular motion, as in Fig. 2. The quirk and mouldings may be smoothed down with fine glass paper, care being taken not to rub the projections too vigorously, as this may remove the varnish, and when the second coat is applied it will present a patchy appearance owing to the varnish sinking into the bare wood. The whole should be dried with a duster, removing any traces of dust caused by the glass paper.

The second coat is applied in a similar way to the first. If only two coats are desired, this should be finished off as cleanly as possible, the final strokes being always in one direction and the brush only lightly charged. When a third coat is to be applied, this is done in a similar way, rubbing down between each and being sure that the first coat is quite dry before attempting further work. Working on wet or tacky varnish has the effect of pulling off the previous coat. The process above detailed may be adapted for all outside work.

Re varnishing woodwork requires a similar process, but it must be remembered that varnish is transparent, and any defects in the under coat will show plainly when the whole is finished, so that if the original varnish is badly damaged it will probably be best entirely to remove it. If, however, it is in fair condition, it should be first thoroughly cleaned with soap and water to remove any dirt and grease. A cotton rag is used for this purpose.

A painted surface may be varnished over, provided that the surface is flat and not glossy. Plenty of turpentine in place of oil should be used in the final coat of paint when intended to be varnished. The process is then similar to that described for new woodwork, except that it is unnecessary to size the work.

For old painted work, the surface should be cleaned with water to which is added soda,

and any nail holes or other indentations filled in with putty toned to the required hue with colours ground in oil. The putty is applied with a knife, care being taken not to smear the surrounding surface and to smooth it. If soda is used to clean the work, it should be well rinsed off afterwards with clean water and thoroughly dried. The varnishing may then be carried out.

Treating a Floor. A task which often falls to the home worker is the varnishing of a floor. If the boards are quite bare, it will probably be desired to stain them first. The whole floor, or that part of it to be varnished, should be first well scrubbed, and when dry given a coating of size, and once again left to dry. It is then smoothed down with fine glass paper, and all dust removed, first with a brush and finally with a cotton duster. The area can then be coloured as described in the article on Stain. Assuming an oil stain has been used, a varnish with a similar composition can be employed in much the same manner as described for other work.

The varnish is used freely, and is well worked out, especially at the corners. The best method is to commence at one side and work towards the door when the whole floor is to be coated, as otherwise it may be impossible to leave the room without treading on the wet varnish. If two coats are desired, the first should be allowed to set first, and is then felted down and dusted before the second, in the manner described above.

Where a comparatively large area has to be dealt with, it might be worth while using one of the clear cellulose varnishes, applied by means of a spray. A portable sprayer with foot pump can be obtained and it would soon pay for itself on the many and varied jobs for which it is suitable. Information on these points will be found in the articles: Enamel, Paint, and Sprayer.

VASE. Though vases may be of china, pottery, marble, jade or other semi-precious stones, of gold, silver, brass,

bronze, lead or pewter, of glass or papier-mâché, the classical shapes continue to serve as models even when new forms of decoration are introduced or applied. A glance at our illustrations of beautiful pieces varying in styles and periods, reveals familiar shapes seen in vases made to-day of ordinary wares, except that Fig. 4 is often copied or adapted in cut glass without the lid.

Richly ornamented, precious metal, or genuine antique vases are either collectors' pieces or have a decorative value only. Apart from the risk of damage or breakage they are not usually even effective as flower vases. For this purpose reproductions in plainer styles of pottery and glass of the classical shapes are most satisfactory. Two other shapes are popular, the straight jar for long stemmed flowers and the globe in glass with a small opening in which it is easy to arrange a few fine blooms.

For table decoration one or two sets of four small vases in iridescent, cut, coloured or engraved glass, in white ware, in green or brown pottery, silver or silver lustre are useful. Whether small or large, flower vases should be shaped so that proportionately they hold plenty of water.

Glass vases need attention if they are to be kept bright and clean. They are very easily stained by flowers and soap and water is not always sufficient to remove these stains. They should be cleaned periodically with a little spirit of salt, and if they are dulled, or in any way difficult to reach with a cloth or the hand, a brush or small mop should be used for the purpose. See China, Copied, Japan Ware, Crown Derby, Flowers, Garden Furniture, Glass Ware, Jasper Ware, Pottery, Satsuma Ware, Sealing Wax.

VASELINE. One of the most useful remedies extensively employed in the home for chapped skin and for various other purposes is vaseline, which is a greasy, whitish-yellow, semi-solid

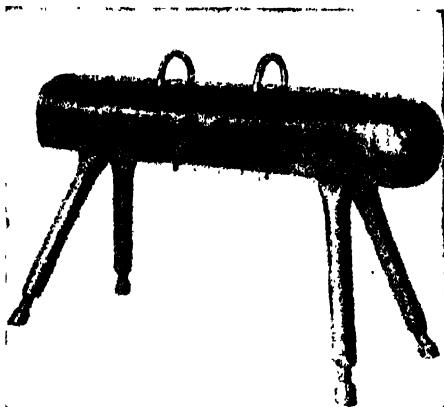


Vase. Fig. 1. Ancient Roman onyx vase in a 12th century silver gilt mounting. Fig. 2. Moorish vase, 15th or 16th century, bearing an abbreviated inscription. Fig. 3. Reproduction of a silver Georgian vase. Fig. 4. Cut glass vase of delicate and beautiful workmanship.

Fig. 1, by permission of the Director, Victoria and Albert Museum, 4, Kensington; Fig. 4, by courtesy of Cecil Davis.

paraffin. It is a useful basis for certain ointments, as it does not become rancid.

VAULTING HORSE. As used in gymnastic exercises, the vaulting horse is made of wood suitably padded and covered with leather and supported on wooden legs which are adjustable as to height. A typical vaulting horse is illustrated in Fig. 1. It has a total length of 6 ft., a width at the top of 16 in., and



Vaulting Horse, Fig. 1. Gymnastic appliance which is adjustable to various heights

a height, without extension, of about 3 ft. 3 in. The curved handles, known as pommels, are fitted in the centre, the portion of the horse between the pommels being the saddle. The left-hand pommel is the neck pommel (N.P.), and the left-hand end of the horse is the neck (N.). The right-hand pommel is the croup pommel (C.P.), and the right-hand end of the horse the croup (C.).

The horse is generally used with a spring board, referred to also as the beating board. When the performer is standing so that the shoulders are parallel to the side of the horse, the horse itself is called side horse or horse sideways. Positions in which the line of the shoulders is at right angles to the length of the horse are called cross positions. The side of the horse at which the spring stands is the near side, and the side furthest away from the board the off side.

The whole of the upper portion of the horse is covered with hide, and the pommels, which are 17½ in. apart, 4½ in. above the saddle, 1½ in. diameter, and 4½ in. circumference, are of iron covered with leather, flesh side outside, tightly sewn to the metal. The pommels are removable and are attached by large fly-nuts underneath the saddle. Exercises on the vaulting horse are begun with or without a run, but are always finished in the full-squat

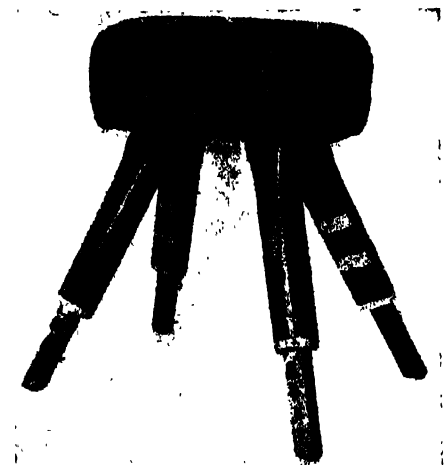


Fig. 2. Smaller appliance known as a vaulting back. It is preferable in small gymnasiae

position prior to the upright position. The pommels are generally grasped with the hands, back upward, known as the pike grasp, with the palms of the hands slightly beyond the centre of the pommels towards the off side of the horse.

There are less expensive alternatives to the vaulting horse, such as the vaulting buck, in Fig. 2. It consists of a padded top covered

with leather or stout canvas and measuring 30 in. by 14 in. by 11 in. high, and supported on four adjustable legs, 1 ft. 9 in., with no extension, and 3 ft. 3 in., with the legs fully extended, the splay at the full height being 3 ft. 6 in. by 3 ft. on the ground. The buck is used for ordinary vaulting exercises, and for small gymnasiae is preferable in many ways to the vaulting horse.

VEAL AND HOW TO COOK IT

With a Selection of Attractive Recipes

The reader of this article will also be interested in those that describe other joints of meats, e.g. Beef; Mutton; and other items of household food. See also Bacon; Boning; Brawn; Curry; Food; Force-meat; Pastry; Soup; Stuffing

The flesh of the calf is closer in texture than beef or mutton, and on this account it has been said to be less digestible, but when properly handled in the kitchen it is one of the most nutritious and palatable of meats. Veal must be eaten while fresh and requires to be well and judiciously flavoured with a stuffing or lemon, otherwise it is rather tasteless. Bacon or ham should accompany it to make up for the absence of fat.

Veal may be eaten in some forms by invalids

Excellent broth is made from veal and also meat stock for white soups. The superior flavour of calf-head, liver, sweetbread, etc., is well known, while the suet surrounding the kidney is particularly adapted for light frothy puddings or forcemeats.

The calf, when killed, should be 8 or 9 weeks old, and never more than 12 weeks. The best roasting pieces are the fillet, loin, and neck, and occasionally the oyster part of the shoulder. For cooking, 20 min. to the lb. is the correct average time.

A fillet of veal from a calf 8 weeks old should weigh just 12 lb., 1 lb. or more, of course, the butcher divides it into two or more portions. It is an economical joint, as there is very little bone and no waste. Before roasting, the centre piece of bone must be removed and the cavity filled with a well flavoured veal stuffing, of which lemon is always a feature. The stuffing must be well secured in the meat either by binding the joint together by tape or skewering it. Loins and necks of veal are not boned before being roasted, but the bones must be pointed carefully. The stuffing should be inserted by separating the skin from the flank from end to end with a sharp knife and forcing it in place, then it should be secured with string.

The outer skin of veal should be protected with a buttered paper or a piece of the caul, and when the joint is almost cooked the protecting paper should be removed, the surface dredged with flour, well basted, and the outside allowed to brown. Veal must be basted frequently while cooking with butter or good dripping provided for the purpose, as the meat possesses little or no fat. Bacon or ham should always accompany roast veal.

Veal Hotch-Potch. Breast of veal makes a good hotch-potch. Use a piece about 5 lb. in

weight. Chop the bones so that the breast can be divided into small pieces, and remove all gristle. Put into a frying-pan about 4 oz. margarine and bacon fat mixed together. Flour the pieces of veal and fry them in the fat till a light brown, then put them into a casserole and pour on them 2 quarts boiling water. Let all boil up, then add 1 pint green peas, a well-washed cos lettuce cut in strips, 2 blades of mace, 3 cloves and 15 black peppercorns tied up in a piece of muslin, a bouquet garni and 2 onions cut in rings.

Season with salt and simmer for 3 hours. Before serving remove the bouquet and the bag of spices. In winter-time sprouts or the hearts of small savoy cabbages and celery cut small may be substituted for the green peas and lettuce.

Knuckle of Veal. This may be boiled or stewed, but much depends on the cut of the joint and how much meat accompanies the knuckle. If cut very low down in the leg, always stew it. A joint of 6 lb. will take from 2 to 2½ hours to boil, but much longer in proportion for stewing, even if only 3 to 4 lb. in weight. Veal must always be cooked in plenty of water when boiled; it must be carefully skimmed and amply flavoured with vegetables. When dished, a sauce should be poured over it into which part of the liquor in which the meat was cooked should be introduced. A small quantity of milk will whiten the sauce and soften it, and it may be finished with parsley, hard-boiled eggs, or, if preferred, it may be left plain.

Veal is a useful meat as the remains of cold joints can be made up into a number of excellent luncheon dishes and entrees. It curries and minces well, makes good rissoles and quenelles, and is excellent in such cold supper dishes as brawn, Cornish pasties, pies, and patties. Recipes for these veal dishes, or recipes which

may equally well be adapted to the use of veal, are given under the various headings.

Veal and Ham Croquette. Mince finely 1 lb. cooked veal and ham mixed, allowing about ½ oz. veal to 2 oz. ham. Add 2 teaspoonfuls grated onion, the same chopped parsley, and a small teaspoonful grated lemon-rind. Mix all these to a creamy consistency with about 1 gill hot, thick white sauce, and season carefully. Turn the mixture on to a plate to cool, shape it into even-sized shapes, such as balls, ovals, pear or cork shapes. Roll these in fine white



Veal. Underview of a side of veal. The separate joints are shown in p. 1350

crumbs, then brush them over with well beaten egg and give them a second coating of crumbs. Fry the croquettes in plenty of smoking hot fat. Drain, and serve on a fancy dish paper, garnishing with fried parsley.

Veal and Ham Pie. Make some flaky pastry according to the directions given in the general article on Pastry. Roll out to required thickness. Cut 1½ lb. lean veal and ½ lb. lean ham into neat squares, slice 2 or 3 hard boiled eggs, and use the slices to ornament the sides and

each of salt, pepper and nutmeg. Remove all the bones and tendons from the meat and spread it, with the skin downward, on the table. Season the meat carefully with salt, pepper and a little nutmeg. Next remove the skin from the sausages, season the sausage meat, and spread half of it evenly over the veal. Cut the ham and eggs in long strips, and arrange them alternately and evenly down the length of the veal so that when it is rolled up the strips run from end to end.

Season the veal again and then spread on the rest of the sausage mixture. Roll up the veal neatly from side to side and tie it up in a cloth like a roly-poly pudding. Put it in the stock pot and let it simmer gently for 2 or 3 hours. Then untie the cloth, re-roll the meat in it, and place it between two tins or dishes with weights placed at even distances on the top one. Leave it until it is quite cold, then take off the cloth, trim a small piece off each end, and brush it all over with a little melted glaze.

Veal Goulash. This stew is made by slicing a large onion into thin rings, tying it in a

glassful of Madeira, and cover the pan again, simmering its contents at the side of the stove, stirring them now and again to prevent burning and adding more stock if the stew becomes too dry. The time required for cooking is about 2 hours. Half an hour before the stew has finished cooking add four average-sized potatoes cut into small cubes.

Veal Mould. This very serviceable and appetizing dish can be made from 1 lb. uncooked veal, 2 hard-boiled eggs, 4 oz. bacon, a little grated lemon-rind, some mixed herbs, and a little parsley finely chopped. A little seasoning, some salad for garnishing, and a pint of white stock are also necessary.

Grease a mould slightly, cut one egg into slices, and with it decorate the bottom and sides of the mould. Remove any skin or gristle from the veal and cut it and the bacon into small dice; then chop up the other egg. Mix the veal, bacon, egg, herbs, and lemon rind together, add a little parsley and season it with pepper and salt. Place this in the prepared mould, taking care not to pack it too tightly, and mortar each layer with seasoned stock.

Cover the mould with a greased paper, place the tin on a baking sheet, and cook it in a moderate oven for 1½ or 2 hours. Then remove it from the oven and tilt up the mould with some warmed and seasoned stock. When it is cold and set, dip the mould in hot water and turn the contents into a dish. Garnish it with a little green salad composed of lettuce, endive, and cress, season it with pepper and salt, and sprinkle a few drops of lemon juice over it.

Veal Pudding. Make 1 lb. suet crust (q.v.). Cut 2 lb. lean veal and 4 oz. ham into small dice. Grease a pudding-basin, roll out two-thirds of the pastry, and line the basin with it. Put in a layer of veal and ham, sprinkle over them a little chopped parsley, grated lemon-rind, and seasoning to taste, and then cover them with some slices of hard-boiled egg. 2 eggs should be sufficient. Continue until the basin is full, and then pour in a gill of water.

Roll out the remainder of the pastry to fit the top of the basin, wet the edges, and put it on, pressing it well. Tie a pudding-cloth over the basin, and then put the latter into a pan of boiling water. Boil for two hours, adding more boiling water when necessary.

Veal Ragout. This stew may be cooked and served in a casserole. Cut 2 or 3 thin rashers of fat bacon into small pieces, fry them lightly in an earthenware casserole, and then add an onion cut into thin

rings. Cook this without browning it for a few minutes, and then put in 1 lb. veal, previously freed from skin and bone and cut into pieces of a convenient size, a bunch of mixed herbs, a little shredded celery, and seasoning to taste. Add also 1 tencupful stock; then cover the pan and cook its contents at the side of the fire or in a cool oven for about 2 hours or until the meat is tender. When it is cooked take out the herbs.



bottom of the dish, pressing them in firmly. Put a layer of veal on top, and shake over it a little chopped parsley and some powder of mixed herbs, a little grated lemon-rind and seasoning to taste. Cover these with a layer of ham and continue thus until the dish is full. The last layer should be of ham. Pour in some stock, preferably made from veal bones, half filling the dish with it. Damp the edge of the dish, lay a strip of pastry on it, damp this also, and then cover the pie with the pastry, ornamenting the top with pastry leaves and tassels.

Bake the pie in a hot oven for about two hours. In hot weather a little gelatine should be added to the stock so that it is certain to set in a jelly. To make a raised veal and ham pie, see fire-tions for pork pie, and the illustration of pie mould, in page 975, 976.

Veal Force meat. Suet is an important ingredient in stuffing for veal as the fat is essential. 1 oz. shredded suet should be allowed to 1½ oz. breadcrumbs. Chop 1 oz. shredded suet finely, mix with it 6 oz. breadcrumbs, 1 tablespoonful finely chopped parsley, the grated rind of a lemon, 1 teaspoonful mixed herbs, 1 dessertspoonful lemon-juice, 1 pinch nutmeg, pepper and salt to taste, 2 rashers fat bacon minced finely. These ingredients are bound together with a beaten egg and a little milk.

The stuffing when made can either be pressed inside the joint to be stuffed, or, if preferred, formed into balls rolled in flour and baked in the oven.

Veal Galantine. To make this, take a small breast of veal, 2 lb. pork sausages, ½ lb. cooked ham or bacon, 3 hard-boiled eggs, with a little

stewpan, containing 1½ oz. dripping, and when it is lightly browned adding 1½ lb. lean veal cut into small squares and freed from skin. Put the lid on the pan and cook the meat until it has lost its rawness, then sprinkle in 1½ oz. flour and seasoning to taste, stirring the whole well so that the flour is mixed thoroughly. Pour in about a teacupful of stock and a large



Veal: some of the joints. Heading downward: fore-quarter, a joint which cuts up into shoulder, breast and neck; hind quarter, comprising leg and loin; leg and loin shown separately; shoulder, a good roasting joint

VEGETABLES AND VEGETARIAN COOKERY

Directions for Preparation and Recipes for Appetizing Dishes

In addition to this article, which deals with vegetables in general and the main principles of Vegetarian Cookery, our work contains entries on the different vegetables, e.g. Cabbage; Celery; Onion; Potato. See also *Ca setole*; Diet; Food; Kitchen Garden; Pastry; Preserving; Pressure Cooker; Salad; Sauce; Saucepan; Soup; Steamer.

In gardening the name of vegetable is given to those plants which have edible roots, stems, shoots, flowers, or leaves. Vegetables are divided into the following chief classes, examples being given of each: Legume—peas and beans, edible rooted—beet, turnip, onion, potato; salads—endive, lettuce, mustard, and cress, vegetables which are really fruit—tomatoes, vegetable marrows, cucumbers and capsicums. Cabbage, kale, Brussels sprouts and asparagus are valued for their leaves or shoots, chervil and sea-kale for their blanched growth, thubarb and celery for their leaf stalks, and cauliflower and broccoli for the edible flower heads. The mushroom is invariably classed as a vegetable although it is really a fungus. Herbs such as parsley, sage, thyme, and other savoury flavourings are usually classed among the vegetables.

Methods of Cooking. The time for boiling vegetables varies. The cook's time table below should be consulted. Salted water should always be used, the proportion being 1 oz. salt to each gallon of water. Most vegetables should be plunged into fast-boiling water, old potatoes and onions excepted. Old potatoes require cold water, and should not be cooked too fast. New potatoes should be cooked in hot water.

Jerusalem artichokes, salsify, and roots of a like character may be cooked partly with milk. An acid, such as lemon juice, should be added.

Blanched vegetables—sea-kale, celery, etc.—require careful handling and are usually tied in bundles before being boiled. They are served on toast, being soft and watery. A paragon is also tied and served on toast.

Onions are better if they are blanched before boiling, that is, if they are boiled up and allowed to cook about 10 min., then the water thrown away, cold water poured on them, and washed in the second water. If treated thus they will be whiter and a finer flavour. Leeks are cooked like onions, but are easier to dish if tied in bundles for cooking. All dried pulse must be soaked for at least 12 hours before being cooked, and must be carefully picked over.

When soaking greens to revive them from packing or handling, add no salt to the water until they have freshened up a little, then change the water and salt it. They should remain about 20 min. without salt. After being thoroughly cleaned they should be plunged in plenty of fast-boiling water and salted according to the directions given.

Green vegetables should be boiled with the lid off the pan to keep their colour. Common soda should never be added to soften hard water. A pinch of bicarbonate of soda may be used with an enamelled pan or earthenware casserole, not with aluminium ware. Many salad herbs may be boiled and served as green vegetables. Lettuce particularly is adapted for this purpose. As soon as the vegetables are cooked they should be drained in a strainer or colander, otherwise they absorb water, lose flavour and become discoloured.

It should be the first aim of the cook to preserve as completely as possible the health-giving salts in vegetables. The usual method of boiling vegetables is too often uneconomical, unwholesome, and destructive of flavour. The more hygienic method is steaming.

All the garden roots are more palatable and wholesome when steamed. There is great loss in boiling carrots, parsnips, and turnips. The nutrients are not abundant in these vegetables, and after boiling only a small residue remains. Artichokes and beetroot may be steamed, and the taste will be improved. The starch and

sugar in parsnips and carrots is much wasted by boiling. When large roots are steamed they should be cut into portions. Small carrots, turnips, parsnips, and beetroots can be steamed whole. A little salt should be sprinkled over all vegetables before cooking.

Drying of Vegetables. Vegetables are dried commercially by machinery, but the housewife may dry small quantities in the oven. Drying trays may be purchased ready made, or may be constructed by nailing together in a square four wooden lathes, and stretching wire gauze across the frame-work. Vegetables should not be put on the iron trays of the oven. Drying must be done only in a moderately warm oven. After the oven has been used for cooking, take out the oven shelf, put in the drying tray with its charge of vegetables, and leave it all night, with the oven door ajar. On the following morning remove the tray, but if the contents are not dry, put it back in the oven in the evening.

The warm, dry air arising from the kitchen fire may be used for drying fruit and vegetables. The drying tray may be placed on the plate rack, or, if the fire is low, the tray may be hung below the rack. In the case of old-fashioned fireplaces, with the chimney opening immediately over the fire, the tray must be placed sufficiently in front to prevent smoke from passing through the tray, for although the fumes of charcoal, coke, or gas will not cause the dry material to taste, coal or wood smoke will do so. In all cases the heat must not be sufficient to scorch the vegetables.

Carrots, parsnips, turnips, swedes, and beet need peeling and scraping in order to remove the outer skin. They should then be cut into slices $\frac{1}{4}$ in. thick, or into shreds by means of a hand grater. Steam them for a few minutes, then place them thinly on the tray and transfer them to the oven. The temperature must not exceed 160° F., otherwise the vegetables will brown. With onions, to avoid the unpleasantness of peeling, immerse them in boiling water for a minute. Then peel and slice them, but do not steam them before drying them as the other vegetables mentioned. Leeks should be treated in the same way, except that they should not be placed in boiling water.

Artichokes	24 to 30 min.
Asparagus	20 to 25 min.
Beans, French and Runner	15 to 25 min.
Broad	20 to 25 min.
Haricot (soak overnight)	2 to 2½ hrs.
Beetroot, small	14 to 2 hrs.
large	24 to 3 hrs.
Broccoli	10 to 15 min.
Brussels sprouts	15 to 20 min.
Cabbage, young	15 to 20 min.
large	50 to 60 min.
red, stewed	1 hr.
Carrots, old	1 to 1½ hr.
new	20 to 30 min.
Cauliflower, medium	20 to 25 min.
Celery, young	40 to 45 min.
Leeks	40 to 45 min.
Lentils (soak overnight)	1 hr.
Marrow	15 to 20 min.
Mushrooms, stewed	30 to 40 min.
Onions, Spanish	1½ to 2 hrs.
Parsnips	1 to 1½ hr.
Peas, green	15 to 20 min.
split (soak overnight)	24 to 3 hrs.
Potatoes, old	25 to 40 min.
new	15 to 25 min.
Salsify	1 to 1½ hr.
Sea-kale	25 min.
Spinach	20 to 25 min.
Tomatoes, baked	20 to 30 min.
Turnips, old	1 to 1½ hr.
new	15 to 20 min.
tops	20 to 25 min.

Spinach, parsley, or mint should be blanched by plunging them into boiling water, to which has been added a little bicarbonate of soda, until well scalded. Cool in cold water, drain, and spread on the drying trays. The more quickly these are dried the better the colour is retained, but when drying rapidly they should be watched closely to prevent scorching. These may be dried without blanching, but the colour is not usually so good. Green peas should be well developed but not old. After scalding, put them into a saucepan with some good sprigs of mint, a little salt and a pinch of bicarbonate of soda, cover with cold water, and bring to the boil or they may be plunged into boiling water and rebuffed there for a few minutes. Finally, cool them in cold water, drain, spread evenly on trays, and dry until quite firm.

With runner beans select those that are not quite full grown, string and slice, then blanch and cool the same as for peas, but without mint. Spread on the trays to a depth of about $\frac{1}{4}$ in., and when well warmed move them about occasionally to allow the air to circulate freely. When the pieces break upon bending them with the fingers they are quite dry. As regards broad beans, shell well-developed but not old ones. Blanch them in plain boiling water in the same way as peas, and dry them until they become like seed beans.

Celery may be dried in the long leaf or cut up into small pieces. It is improved by blanching, although this process is not really necessary. The green outside leaves are also excellent for flavouring when dried, but these should be blanched like runner beans. Thyme and sage should be dried slowly, at a warm temperature, or simply hung up in bunches in a warm, airy place.

When soaking vegetables for use, a little bicarbonate of soda added to the water will assist them to regain size more quickly.

To store them, the best way is to put the dry vegetables in stout brown paper bags and to hang the bags in the kitchen. If no thoroughly dry room is available, store them in tin or in airtight bottles.

During spring and summer, when fresh vegetables are plentiful, it is a wise plan to bottle some of them for winter use. A simple outline is illustrated in p. 998.

Vegetable Presser. Constructed from a good hardwood, the presser is employed to remove the surplus water from vegetables which have been placed for the purpose in a colander. These pressers are obtainable in turned wood with a flat and a slightly domed surface.

Vegetable Rack. Racks for the storing of vegetables are made in wood and in metal. An inexpensive, clean and convenient type of wire rack for the small larder is here illustrated. The air is able to reach all the contents of the rack, and to keep them fresh and crispier than when stored in wooden trays. The racks are obtainable enamelled in colours.

Vegetarian Cookery. Vegetarian dishes should not be principally composed of vegetables, as excess of the everyday vegetable will cause flatulence. Nuts, cereals, and, where they are included in the diet, eggs and cheese are all useful as main ingredients for these dishes. Peas and beans seem more easily digested if taken in a moist form and if mashed or made into a purée. Hence pea or bean soup is both wholesome and agreeable, but, on the other hand, pea pudding or a dish of plain boiled beans will prove indigestible to some persons.

The sweet course in a vegetarian dinner or luncheon may be much the same as that for a meat meal, only no suet or lard may be used in the preparation of puddings or pastry, neither may lard be used for any kind of cakes or even for greasing tins. Vegetable butter or real butter is the only fat permissible. Oil is the best medium for frying.

Fresh salad herbs should form part of the meal where foods somewhat deficient in mineral salts are the principal dish, pulse foods, for instance. If salad is difficult to obtain, the use of lemons is recommended: oranges also are beneficial, while grapes contain the necessary health salts. Many excellent recipes for salads are given under that heading.

Dried fruits such as dates, prunes, raisins, and figs are nourishing and useful in the preparation of many dishes. Nuts are usually ground, particularly if they are to be added to other ingredients, and a nut mill can be bought for this purpose. Cheese is a strengthening food and therefore most valuable where meat is omitted. For persons of sedentary habits it is more digestible if grated or cut in small pieces and mixed with other ingredients.

Specimen Menus. The following are two specimen menus for a vegetarian meal, the first being suitable for winter and the other for summer:

No. 1

Salsify Soup

Lentil Stew

Cauliflower au Gratin Mashed Potatoes

Orange and Chestnut Cream

Dessert

No. 2

Tomato Soup

Haricot Bean Cutlets

Green Peas

New Potatoes

Cherry Pie

Cream

Dessert

Salsify soup is made like ordinary white soup, except that the necessary liquid or stock consists of $\frac{1}{2}$ water and $\frac{1}{2}$ milk. The lentil stew is made by soaking overnight and preparing 1 pint red lentils, then stirring them for 5 min. in 2 oz. butter which has been melted in a stewpan. Add 1 quart cold water, and when all boils up put in 2 onions, 3 sticks celery, 2 carrots (all prepared and cut small), 1 teaspoonful grated lemon-rind, and seasoning. Simmer for $1\frac{1}{2}$ hours, then stir in 1 oz. barley flour mixed to a thin paste, also 1 tablespoonful chopped parsley and the same of red currant jelly. Cook again for 15 to 20 min., when the stew should be thick enough. Serve it with croutons of fried bread or toast.

Orange and chestnut cream is made with chestnut purée and sections of oranges peeled and piped and tossed in a strong syrup. The purée and oranges should be piled in alternate layers on a dish and masked with whipped and sweetened cream.

In the summer menu the tomato soup differs little from an ordinary tomato soup, except that bacon is omitted and bran stock is substituted for the meat stock. This is made by pouring 1 quart boiling water over 2 tablespoonfuls bran, letting it stand till cold, and then straining it. A small quantity of cream should be boiled up in the soup just before serving it, and it should be well seasoned.

Haricot bean cutlets are made by cooking 1 pint white haricot beans with 4 shallots till tender, then chopping them fine. A thick sauce must then be made, using $1\frac{1}{2}$ oz. butter, $1\frac{1}{2}$ oz. flour, 1 gill water that beans are boiled in, and 1 gill milk or cream. Season the sauce well, add the beans, 1 tablespoonful prepared and chopped mushrooms, $\frac{1}{2}$ teaspoonful each mace, and lemon-juice, and a little chopped parsley, and mix all together. When cold, shape into cutlets, egg-crumb, and fry in boiling oil. Serve with horseradish sauce.

Many savoury vegetarian dishes may be made by using Italian pastes, macaroni, vermicelli, spaghetti and noodles as a foundation, including also Tagliatelli. For this make a smooth, firm dough with 1 lb. flour, 5 eggs, 1 oz. butter, salt, and warm water as required. Roll out the paste $\frac{1}{8}$ in.

thick, let it set, and then fold it over and over flouring it to prevent sticking. Cut it into shreds and poach for 6 min. in salted water.

Porridge is useful as a breakfast dish. An uncommon kind to-day is the old-fashioned frumenty, a wheatmeal porridge flavoured with raisins and cooked in a jar in the oven for several hours. Gelatine must not be used in vegetarian cookery. Aga-aga is sometimes substituted, but it is not recommended for general purposes. Recipes for vegetable curries are given in the general article on Curry.

Galantine. Excellent vegetarian entrées are made of nuts, onions, or lentils as the basic ingredient. Nuts of any kind and bread-crumbs, boiled rice or mashed potatoes form the main ingredients of a good galantine. It is made by shelling and blanching 3 oz. nuts, skinning them, and putting them through a mincing machine. To this mince add $\frac{1}{2}$ lb. breadcrumbs, or the same quantity of rice or potatoes, a finely minced onion, and 1 teaspoonful each of chopped parsley and mixed herbs. Season the mixture well, and bind it with 1 gill stiff white or tomato sauce, and the well-beaten yolks of two eggs.

Shape the whole to form a large sausage. Put it into a scalded floured cloth, tie the ends securely and place it in a saucepan of boiling water. Let it simmer for $1\frac{1}{2}$ hours, put it on a dish, remove the cloth, and press the galantine between two tins with a weight on top. Leave it until it is cold, then trim the ends neatly and brush it over with glaze.

Lentil Cake. The ingredients for a lentil cake are $\frac{1}{2}$ lb. cooked lentils, $\frac{1}{2}$ lb. cooked potatoes, 1 oz. margarine, $\frac{1}{2}$ teaspoonful powdered herbs, a teaspoonful each of chopped parsley, grated onion, flour, milk, breadcrumbs, and frying with a little salt and pepper.

The lentils, which should not be watery, should be rubbed through a sieve with the potatoes. Then melt the margarine, add the lentils, potatoes, herbs, parsley and onion, after which the whole should be heated, seasoned and mixed well together. Turn the mixture on to a plate to cool, and make it into small flat cakes on a floured board. They should be brushed over with milk, coated with breadcrumbs and fried in hot fat. When ready, drain them on soft paper and serve them on a hot dish garnished with fried parsley.

The cakes will be improved if a beaten egg is added to the mixture while it is being heated. Another way is to place on each cake either a poached egg or half a hard boiled one with the cut end downwards, the egg being coated with tomato sauce.

Onion Pudding. To make an appetizing onion dish, take six small Spanish onions, 1 breakfastcupful breadcrumbs, an egg, a little milk, and some brown gravy, together with 1 dessertspoonful melted butter, a little grated lemon-rind a pinch of nutmeg, and a little pepper and salt. Slice the onions and fry them to a golden brown, and then line a small pudding basin with them. Mix the breadcrumbs, the egg, which has been well beaten, the butter, nutmeg, and lemon-rind together; add the pepper and salt, and mix all thoroughly with a little milk. Pour this mixture over the onions and steam it for $1\frac{1}{2}$ hours. The gravy should be heated and used for serving with it.

Vegetable Patty. Cooked vegetables, such as carrots, turnips, peas, etc., can be made into patties in the following way. Line some greased patty pans with short pastry, using lard, if possible, as given in the recipe in page 900, or half lard and half margarine. Fill the cases with rice so as to prevent them from rising in the centre, and then bake them in a hot oven until they are lightly browned. Bake also some strips of pastry shaped like handles. In the meantime, cut all the vege-

tables, except the peas, into small dice, heat them up in a little thick white sauce and season them to taste.

When the pastry cases are cooked take out the rice and turn them out of the pans, fill them up with the hot vegetable mixture and fix a handle to each, using a little raw white of egg to fasten these to the sides. Serve the patties at once. They are better eaten hot than cold.

Vegetable Pie. A hot vegetable pie can be made thus: melt 1 oz. margarine in a small pan, add 2 tablespoonfuls chopped onion and fry these to a pale brown colour before pouring in 1 gill brown sauce or gravy. Simmer the whole for about 4 min., then add $\frac{1}{2}$ lb. cooked macaroni cut into small pieces and 2 oz. grated cheese.

Break a small cooked cauliflower into sprays, and peel and slice 3 tomatoes and 4 large mushrooms. Arrange these in layers in a well-greased pie-dish, cover them with the macaroni and sauce, and then put on a lid of short-crust pastry. Decorate the edges with a knife, ornament the top with pastry leaves, and then bake the pie in a hot oven until it is lightly browned. Serve it in the dish in which it is cooked.

VEGETABLE MARROW. This is the full name for the vegetable more usually known as the marrow, hints on the growing of which, and recipes for marrow dishes, are given in page 763. See Marrow.

VELLUM: How to Mount. Vellum is the name given to parchment made from the skin of young calves and lambs, which is exceedingly durable, and is used for legal documents, bookbinding, and for illuminated addresses. It is finished with an ivory appearance and is unequalled as a surface for lampshades and other articles for which imitation vellum or vellum paper is generally used. Vellum can be stained by first soaking it in water and then dipping it in a chemical or vegetable dye, but it is advisable to test the effect of the dye on a scrap of the material before attempting a whole skin, as dyes differ widely in their action.

In the preparation of vellum for writing or illuminating considerable care is required, and although it is often stretched on a board by professional workers, the better plan for the amateur is to mount it on a suitable board. The materials required are a sheet of mounting board of the thickness known as 8 sheet, a basin in which hot water is placed, covered by a saucer, two teaspoonfuls of secotine and two of hot water being mixed together in the saucer, a basin of cold water, some sheets of clean white paper and some greaseproof paper or thin vegetable parchment, two pieces of clean linen about the size of a handkerchief, two small sponges, some fine pumice powder, two flat boards, a piece of heavy cardboard, and some weights for the purpose of keeping the mounted vellum under steady pressure.

First of all the vellum is placed right side up on a sheet of clean paper and thoroughly damped with a sponge with cold water; the surplus water is wiped off with one of the linen cloths, and then the vellum is turned over and the same procedure carried out on the other side. Wipe off the surplus moisture as before, and then dip the other sponge in the secotine mixture and thoroughly cover the back, taking care that the extreme edges are covered with the secotine.

The vellum is now lifted up and placed in the centre of the mount, with the edges quite square. Beginning at the top, the surface is stroked down with a clean linen cloth to remove the air from underneath and to bring the material into the closest contact with the mount. A sheet of clean white paper is placed on the top of the vellum, the cardboard is laid over it, and the mounted work

is put between two boards with the weights on top. The vellum should be kept under pressure for at least twelve hours in order to allow it to dry quite firm and even before decorating it.

The material is now ready, and should be dusted over with some fine pumice powder, but on no account should it be touched with the fingers. The design or lettering to be placed on the vellum is first drawn out on a piece of thin paper as carefully as possible. The back of the paper is rubbed over with blacklead and thoroughly rubbed in with a piece of rag. The drawing is placed in position, and the lines transferred to the vellum with an agate tracer or fine tylo, only the thinnest line being required. Ordinary carbon transfer paper is not suitable for use with vellum, owing to its greasy nature and the liability of making other marks caused by the pressure of the fingers on the paper while working.

For the ink work, a waterproof Indian ink should be used. A ruling pen should be employed for straight lines and other lines that can be drawn with a compass; for freehand lines and lettering a fine drawing-pen is required. Colouring is done with the best quality of water colours mixed with a little gum arabic. Gold can be applied, but it should be shell gold and mixed with gum arabic. For silver effects it is better to use aluminium in the same way as the gold, as it is not liable to tarnish as is the case with silver. Lines can be rubbed out with putty rubber.

Seraps of vellum boiled down make an excellent size for applying gold leaf, and this is the material generally used. For the purposes of bookbinding there are several kinds of vellum available. Prepared or artist's vellum is prepared in the natural colour of the skin. Roman vellum is similar but darker; it is always attached to the boards with the flesh side downward. Vellum can be cleaned with benzine applied with a sponge, stains being removed in this way without destroying the texture. See Bookbinding, Lampshade.

VELOURS: The Material. This is the French name for velvet, and velours applies in Great Britain both to wool and to cotton plush cloths made with a short and more or less velvety nap, which is produced by finishing the cloth in a special manner. This nap is soft to the touch, and it enriches the colour, lending a peach-like bloom.

Wool velours cloths sometimes show a fancy design, and are known as jacquard velours where the design is woven. Sometimes the pattern is merely embossed and therefore less permanent.

Cotton velours, which makes rich looking curtains, showing a double tone of colour, is obtainable in a fine range of colours, warranted not to fade.

Velours Hat. Made especially for winter wear, velours hats are manufactured from hare fur on a foundation of soft felt. The better qualities have a silky, plush-like surface, and Austrian velours, which are the most of all, are among the most expensive and durable of hats. The cheaper kinds, and especially the imitation velours, wear badly, and quickly lose their shape.

VELTHEIMIA. This is a South African bulb suitable for cultivation in pots in the greenhouse or in a warm sheltered border out of doors. A suitable compost consists of loamy soil with a little leaf-mould, decayed manure and sand. The chief kind is *Veltheimia viridiflora*, with rich green leaves and pale rose-coloured flowers in summer on a stem 12 in. or more high.

VELVET. Millinery velvet is usually narrow. Collar velvet is a specially dense and fine fabric, built for hard wear. Old fashioned

dress velvet was a warm hard-wearing silk pile fabric which is not much used nowadays. The chifon and ring velvets are made with a lighter and more open pile. They hang in graceful folds and have a soft rich and glossy surface in which the separate rows of tuft can often be seen.

The most exquisite shades can be dyed on silk velvet and no fabric shows off a tone



Velvet. Caton stitch, the special stitch used when velvet has to be turned down and hemmed.

colour to greater advantage. The mohair velvets or moquettes are used largely in place of all velvet for upholstery.

When cutting velvet for millinery and trimmings care should be taken to cut it on the cross, otherwise there may be trouble in getting it to be flat. Velvet can be finished in appearance by steaming with a hot iron. The face of the iron should be turned uppermost and the velvet passed over the surface by hand. Cuttings of velvet should always

be saved. Worn out velvet can be used as a polishing cloth for boots, metal and furniture.

Unless velvet is so arranged that the pile lies all in one direction, different shades will appear on the garment, and the result will be patchy. The material should be examined in a strong light before it is cut, and the pieces so placed together afterwards that the shading is uniform. If the pile is running in the right direction the velvet will appear dark when held up to the light.

Catch Stitch. A special stitch used for hemming velvet is termed catch stitch. It is done by turning down the velvet once—not twice as is usually the case in hemming—and sewing from right to left. Commence by taking a stitch on the turned-down portion without bringing the needle through to the right side; then make a tiny stitch immediately below the turning, taking up only a thread of the right side of the material. Continue thus until the hemming is completed. When accurately done no stitches can be seen on the right side of the velvet. This stitch is also used in millinery.

VELVETEEN. The best velveteens to buy are those guaranteed to have a fast pile, meaning that the tufts are not loose enough to work out easily and are a fast colour. In the better class fabrics there is a good range of colours.

VENEERING FOR THE AMATEUR CABINET MAKER

A Decorative and Useful Method of Surface Treatment

In this development are reported articles dealing with Marquetry, and the use of veneering in the various and intricate work of the cabinet maker. See also Cabinet Making, page 1313. See also Wardens.

Veneering is the process of applying a comparatively thin sheet of wood of fine or rare quality to a groundwork of a plainer variety of wood. It thus enables many beautiful woods to be employed for decorative work which are prone to twist or crack if made use of in the solid. A typical example is the employment of curls and burls, which would prove completely unsatisfactory unless applied in the form of veneers.

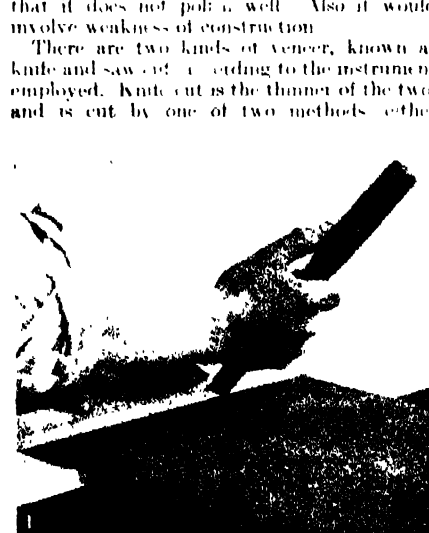
It is also the only satisfactory method of employing such decorative effects as quartering, balanced matching of grain, and other flat treatments in which the work relies for its effect upon the disposition of various woods, the grain of which runs in contrary directions. In shaped work veneering is almost indispensable. To cut the wood in the solid would entail a certain amount of end grain showing, an undesirable feature in itself owing to its exhibiting no beauty of grain and the fact that it does not polish well. Also it would involve weakness of construction.

There are two kinds of veneer, known as knife and saw cut, according to the instrument employed. Knife cut is the thinner of the two, and is cut by one of two methods, either

rotary or flat. In the former a log is placed in a structure similar in principle to a lathe and having a long knife edge stretching along its whole length. The knife is adjusted to cut the required thickness and moves forward against the log as it revolves, thus cutting a veneer the same length as the log and of practically unlimited width.

This method has the effect of giving a very enlarged grain, and is impracticable when, for example, a wood is to be cut which relies for its appearance upon the medullary rays, as in figured oak, for which the flat-knife method is adopted. The finer woods are cut in this way, a machine similar to a plane taking off veneers. Saw-cut veneers run from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. and are cut with a circular saw, all such woods as curls being cut by this method.

Preparing the Ground. A very important consideration in veneering is the ground to which it is to be applied. The wood should be



Veneering. Fig. 1. Cutting knife-cut veneer with a chisel. Fig. 2. Cutting saw-cut veneer with a veneer saw worked against a straight edge.



as straight in the grain as possible, clean and dry, and with the least tendency to warp and shrink. For these reasons Hondurás mahogany is the most suitable, as it is not only reliable but holds the glue well. Yellow pine also makes a good ground, and, if possible, a board having the medullary rays running through it should be chosen, as boards cut in this way are less likely to twist. All soft woods should be sized before the glue is applied for the veneering process, as otherwise the ground will not



apt to soak up more than its share of the glue and have the veneer liable to peel off.

As the tendency of veneer is to pull the ground, making a hollow surface, it is advisable to apply the veneer on the heat side of the wood so that the natural pull of the wood is opposed to that of the veneer. Another good plan, in order to avoid undue twisting, is to damp the back of the ground. Note that wherever possible, the wood should be veneered on both sides.

All grounds should be roughened with a toothling plane before any veneer is applied. This is done after the ground has first been planed perfectly true and flat. After the use of the toothling plane the ground is ready for the veneer, except in the case of a pine or deal ground, when it is necessary first to size it. The size, which is composed of thin glue, is applied hot with a brush and allowed to harden, when it is rubbed down with coarse glass paper and all dust removed with a brush.

Cutting the Veneer. A piece of veneer is now cut to the size required. If knife-cut veneer is used, this operation may be accomplished with a chisel, as in Fig. 1, using a straight edge to ensure a straight cut. The straight edge should be firmly held down with the left hand as shown and the chisel held in the right with the bevelled side against the straight edge, and drawn across the veneer. The veneer should be placed on a flat board during the cutting to give support for the chisel, and care should be exercised at the completion of the cut to avoid tearing away the edge of the veneer. An extra allowance of about $\frac{1}{4}$ in. should be made on all sides.

Saw-cut veneers may be cut with a chisel, if desired, although a better method is to use a veneer saw, as illustrated in Fig. 2. The saw consists of a blade having a slightly rounded edge and fitted with a handle screwed to one side of the blade. It is worked against a straight edge, which, if a wide piece of veneer is being cut, should be hand-screwed or clamped to the bench to avoid its shifting.

For cutting narrow strips of veneer of equal width a cutting gauge may be used. In this case the sheet of veneer is placed to overhang slightly a flat board, and another board or a batten sufficiently long to reach the width of the sheet placed on the top a short distance from the end and firmly held down with the left hand. The purpose of the top batten is to

prevent the veneer from buckling, which would render it liable to split. A cutting gauge is then set to the required width and worked along the edge of the sheet in the manner shown in Fig. 3. Only a slight pressure should be maintained, making several light cuts in preference to one deep one. The veneer should not be cut right through from one side, but is reversed after being cut half through and the process then completed from the other.

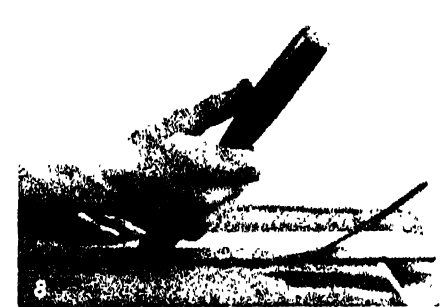


Veneering. Fig. 3. Cutting narrow strips of veneer with a cutting gauge. Fig. 4. Heating the glue under the veneer with a flat-iron. Fig. 5. Use of veneering hammer to squeeze glue out beneath veneer. The movement of the hammer is shown in the diagram below. Fig. 6. Cutting overhanging edges away with a chisel. Fig. 7. One-half of veneer laid and remainder being placed in position, edges overlapping. Fig. 8. Cutting through both thicknesses to make a clean joint.

Applying Veneer. For the actual process of veneering two methods are available, the hammer and the caul. The latter is used for laying saw-cut veneers, and in all cases where built-up patterns of veneers such as quartering and the like are employed. The former method is employed successfully for the majority of knife-cut veneers. Having trued up the ground a flat-iron is heated and glue prepared.

The glue should be as hot as possible, and of such a consistency that when the brush is lifted from the pot the glue runs down in a continuous stream. All the ground is coated with the glue and also the underside of the veneer, care being taken that no grit or foreign matter is allowed to remain in the glue. The veneer is placed on the ground in position, and the surface rubbed lightly over with the hands. A wet swab is rubbed over the whole to moisten it, and a little glue added so that

the surplus glue under the veneer, Fig. 5. The hammer is placed first in the centre of the work and worked outward with a zig-zag movement, thus driving the heated glue outward. A diagram showing the correct movement is given in Fig. 9. It is essential to work outward from the centre, since the object is to bring the veneer into as close proximity with the ground as possible, and this can only be accomplished by driving out the surplus glue.



Veneering. Fig. 3. Cutting narrow strips of veneer with a cutting gauge. Fig. 4. Heating the glue under the veneer with a flat-iron. Fig. 5. Use of veneering hammer to squeeze glue out beneath veneer. The movement of the hammer is shown in the diagram below. Fig. 6. Cutting overhanging edges away with a chisel. Fig. 7. One-half of veneer laid and remainder being placed in position, edges overlapping. Fig. 8. Cutting through both thicknesses to make a clean joint.

It will be found necessary to reheat the glue with the iron once or twice during the process.

When the whole has been worked over with the hammer, the surface is wiped clean with the swab and tested to see that the veneer is everywhere down. This may be done by lightly tapping with the finger nails, when, if the work is correctly done, a solid feel is apparent. Any bubbles will be obvious from a hollow sound, and any such places should be remedied by reheating and working flat with the hammer.

Particular attention must be paid to the edges, which are apt to work up. The overhanging edges are cut away, as shown in Fig. 6, placing the work veneer side downward on a flat board, pressing tightly downward with the left hand and drawing a keen chisel across the veneer. The cross-grain ends should be cut first, since these are the most apt to split away at the ends, the remaining sides being cut after cleaning off any ragged corners. The work is then left to harden, placing it with the veneer side downward.

With a very wide board requiring two widths of veneer, one sheet should be laid as described and the second sheet put down in a similar way, allowing it to overlap the first by about 1 in. Fig. 7 shows the second half being placed in position. A straight edge is placed along the overlapping portion and firmly held in position.

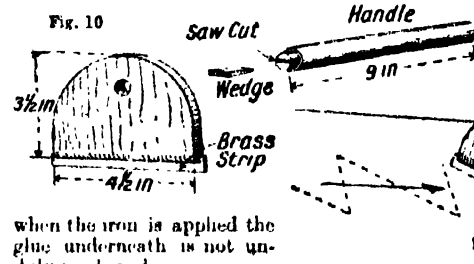
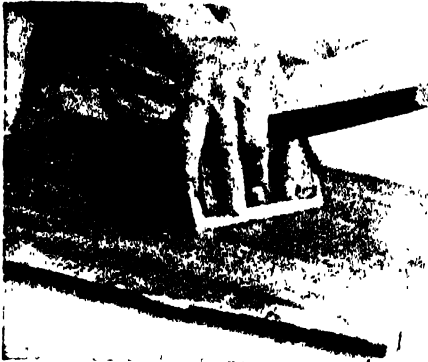


Fig. 9. Showing zig-zag movement of veneering hammer illustrated in use in Fig. 5 above. Fig. 10. Details of veneering hammer; it consists of a brass blade fitted into a block of wood with handle attached.



while a cut sufficiently deep to pass through both thicknesses is made along its length with a chisel, as in Fig. 8. The surplus of the upper thickness is removed and the veneer raised, as shown in Fig. 11, so that the surplus of the lower veneer may be taken away. The veneer is then replaced, heated with the iron, and rubbed down with the hammer. Pieces of old newspaper should be glued over the joint to prevent it from opening while drying.



Veneering. Fig. 11. Raising one piece of veneer and removing waste after cutting with chisel. Fig. 12. Alternative method of holding hammer, with one hand; compare with Fig. 5. Fig. 13. Laying banding, using the back of an ordinary hammer to press out the superfluous glue.

Details of a veneering hammer are given in Fig. 10, which shows it to consist of a brass blade having a rounded edge lifted into a cut made in a block of wood, this being fitted with a rounded handle. One method of holding it has already been illustrated in Fig. 5, using two hands. An alternative method is given in Fig. 12, in which the hammer is grasped with the right hand only. When the work is quite set, if any bubbles or blisters are seen they should be removed by lifting the veneer with a thin chisel or penknife to let the air out, working a little glue under the veneer and then heating and finally pressing out with the hammer.

Cross Banded Work. Fig. 13 shows the treatment of veneered work having a cross banding and an inlaid line at the edges. This is easily accomplished by first veneering the centre portion as already described, except that it is unnecessary to allow the veneer to overlap, rather cutting it slightly smaller than the actual size of the ground. This done, it should be allowed to set.

Several strips of cross-grain veneer are then cut with a cutting gauge, as in Fig. 3, to slightly more than the width required for the finished banding. One edge of all these should be planed true on a shooting board, a batten being placed on the top of the veneer to prevent it from buckling. An iron plane or finely set trying plane is used.

The cutting gauge is set to the width required for the banding, including the line, and a cut made on all four edges of the work deep enough to cut through the veneer, the surplus veneer being removed with a chisel. If any difficulty is experienced in removing it, the glue should be heated with the flat iron, when the veneer will be found to peel off. The line is then mitred to fit at the corners and glued around, a few veneer pins being carefully driven in at the side of the line if there is any difficulty in keeping the veneer in place. It should then be left for the glue to harden. The banding is cut to the required length, with



mitred corners and glued in position, using the flat pole of an ordinary hammer to press the glue out, as in Fig. 13. If this is done quickly and very hot glue used, it will not be necessary to reheat the glue with the flat iron. Paper should be glued over all the joints

in order to prevent them opening.

The edges of a board or other piece of work are veneered by placing the work in a vice for the purpose. This should not be done until the veneer on the top surface is quite set, after which the edges should be planed, using a very keen edged plane finely set. Strips of veneer are cut and laid by means of the back of a hammer. When set the veneer is trimmed off and the surface scraped and glass-papered. It is essential to allow all veneered work to set thoroughly before attempting to clean it up, which is done with a steel scraper (q.v.) and afterwards it is finished with glass paper.

Use of the Caul. To lay saw-cut veneers and built-up patterns by means of a caul requires a different procedure. The veneer is first cut to size and the ground prepared as described for the hammer method, and both then glued. The veneer placed in position and a sheet of paper placed on top. In the case of a pattern two veneer pins should

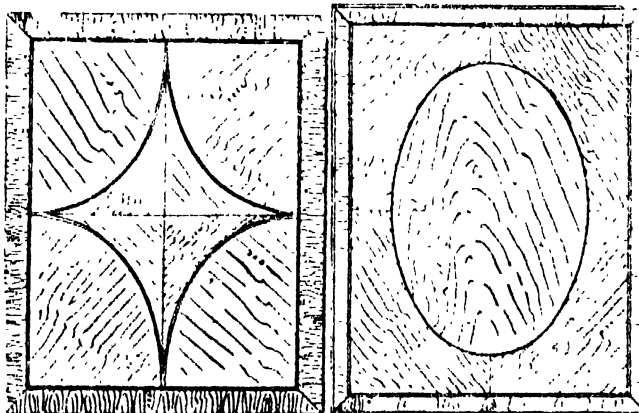
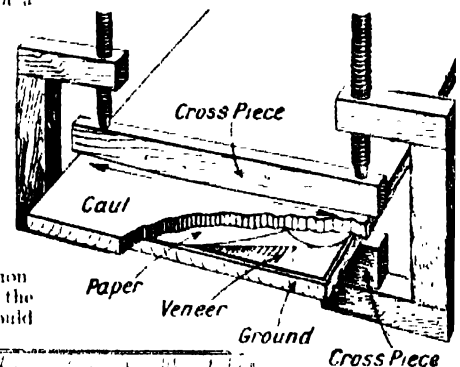
be driven in to prevent it from shifting. The caul consists of a board about 1 in. thick and slightly larger than the ground to be veneered. It is slightly rounded in shape on one side. This is thoroughly heated and quickly hand-screwed round side down on to the veneer on top of the paper, the latter being used to prevent the caul from sticking.

For a large surface to be caul veneered, cross pieces are used as shown in Fig. 14. The upper pieces are rounded on their under edges to force the glue out, and the lower pieces straight and thicker than the top ones, so that when pressure is applied at the ends the top pieces are bent so that their lower edges become straight. It is sent all in all cases of caul veneering to work smartly when once the caul has been heated so that the glue is thoroughly melted. Other information about the process is given in the article on Marquetry.

To veneer patterns such as those given in Figs. 15 and 16, the design is first drawn on paper and the various pieces of veneer cut to shape and glued on to the design. It is then treated as a whole and laid with a caul. For further information reference should be made to the article on Inlaying, where the treatment of simple designs is dealt with in detail.

VENETIAN BLIND. Although it has been largely replaced by the ordinary spring blind, which is easier to keep clean and in order, or by casement curtains, the Venetian blind has advantages. It is the British substitute for the continental shutter and has the same useful quality of keeping out the sun and at the same time permitting effective ventilation. Moreover, it permits the gradation of the light, which may be fully obscured by having the slats closed or partially by having them slanting. The great drawback is the clumsy appearance of these blinds and the extra cleaning which they entail. Few people would select them for a new house, but where already installed they can be used without trouble for long periods providing the adjustments are correct.

The blinds should be dusted with a soft brush at frequent intervals, the laths should be



Veneering. Fig. 14 (above, right). Showing use of cross piece in caul veneering a large surface. Figs. 15 and 16 (below). Two examples of built-up veneer patterns.

turned down with the laths inclined to the window, and the brush stroked from side to side, working from the top to the bottom on the window side first. The laths are then turned in the opposite direction and the same procedure followed on the inside of the room.

In the event of broken cords or tapes it is a waste of time to attempt to repair them. New material should be fitted, and,

although this can be done with the blind in position, it is usually more convenient to take it down, and at the same time to look over the other adjustments. The top lath of the blind is either screwed directly to the window framing with two screws or supported on small metal brackets, the latter being the more satisfactory. In old fittings the screws become loose and fail to hold the blind up. The remedy is to use screws of a larger diameter, to plug up the old holes with a glued peg, and to rehang the blind with two small iron angle brackets.

To remove the blind either for thorough cleaning or repair, it should be let down, the tapes unfastened at the bottom and the cord unknotted and withdrawn. The laths are now slipped out and the top screws removed. With a bracket fastening the blind will remain in place after the screws are removed, but with those fastened direct to the window frame each screw should be undone for a few turns, so as to equalise the strain and allow the top bearer board to be held in position while the screws are entirely withdrawn. The blind is laid on the floor and the tapes gathered up close to the laths, so that the blind can be carried away.

If possible the shop practice of supporting the blind on angle brackets should be adopted. The brackets can be attached to the wall, to an old door, or to a temporary framework erected for the convenience of handling. If this method is not possible the blind should be spread out at full length on a large table or on the floor. The tacks securing the tapes to the bottom lath should be pulled out with a pair of pincers, the tops of the tapes taken off in the same way, and the lengths can be washed if they are in good condition.

To clean the laths, they should be gathered together and placed in a bucket of soapy water, so that the edges can be rubbed over with a scrubbing brush. Each lath should be scrubbed over on both sides, and then rinsed in clean water, and placed on one side to dry. The laths should be rubbed over with a dry cloth, and then with beeswax and turpentine, the final polish being given with a soft clean duster.

In some cases a better appearance can be given to Venetian blinds by painting them cream colour or almond green. All blinds in front of a house should be of the same colour. The old paint must be removed and the surface of the laths smoothed with glass paper and given a coat of weak glue size, before applying the necessary coats of paint. Paint with a very hard glossy surface, suitable for exterior work should be chosen for the purpose, otherwise with exposure to the sun there will be a tendency to blister.

Re-taping the Blinds. The work of re-taping and re-cording can now be proceeded with. The tape, known as ladder tape, is obtained in several qualities; the best has the ladder or connecting pieces woven in with the webbing, as in Fig. 1, and no other kind should be used. It is made in unbleached, half-bleached, and white, as well as in green, buff, and red. In addition to the lengths required for the laths, two or three short lengths are needed to attach the top lath to the bearer, and these are known as the shading tapes. The total lengths of the new tape and cord after being carefully measured can be secured to the laths with tacks.

The shading tapes are supported on rollers, which are provided with a long spindle, and fit in slots cut in the top of the bearer. They are not, as a rule, liable to damage, but they should have free movement, and be fixed so as to be parallel with the surface of the bearer. Each length of webbing, which can be taken from the ladder tape by cutting off the cross pieces, should be 10 in., threaded through the roller opening, carried over the roller, and

brought out to the same side. The ends are folded under and tacked to the top lath, as in Fig. 2, resting the lath on a block of wood so that the tacks can be driven in tightly. In blinds where there are three shading tapes, the two end ones should be secured first, taking great care that the top lath and the bearer are quite parallel, and that the lath just clears the bearer when turned up.

The centre tape is adjusted to support the lath and prevent sagging. The long ladder tapes are secured to the top lath, so that the centre is exactly underneath the pulley wheel opening (Fig. 3), about $\frac{1}{2}$ in. of the material being turned in underneath to hold the nails. The ladders must be the same height each side to ensure that the laths will be horizontal, and it is an advantage to hang the blinds on temporary brackets and to fit a couple of laths in position. The double cord for the shading adjustment is secured to the top lath by nailing it in a narrow groove provided for the purpose. Before the cord is fastened on, a Venetian driving eye should be threaded on.

The laths are slipped in position while the bearer board is suspended on the brackets, and

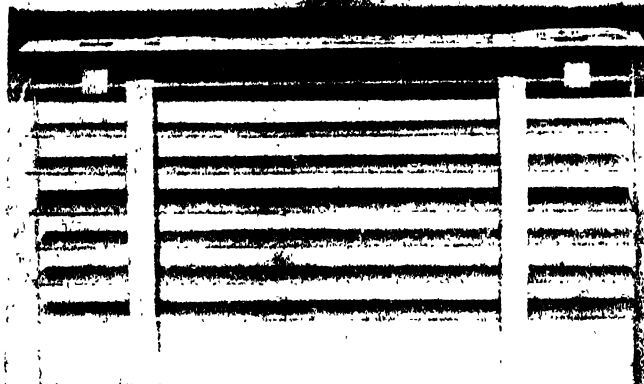
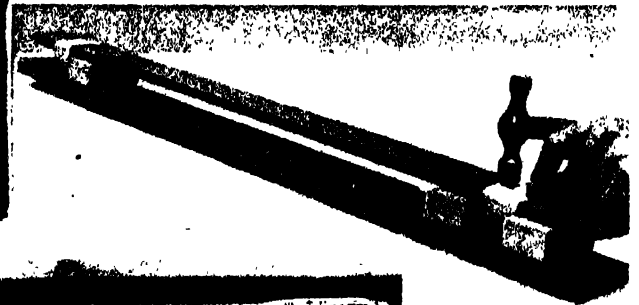
the new cord can be threaded through each lath, taking care that the cord runs between the alternate cross pieces of the webbing. Sufficient length of cord should be allowed to bring the loop

should be tested, and it correct the ends of the tape should be folded underneath and secured with two or three tacks.

In the event of a lath being broken, a new one can be made from a piece of yellow pine planed to the required width and thickness and cut to length. The holes should first be bored with a small centre bit and enlarged with a fairly flat scribing gouge, the blind-maker would punch the hole out, but this is rather a risky proceeding for the amateur. There is no need to take the blind down to fit a new cord. It is a simple matter to thread the cord through the holes and over the pulleys in a bracket-hung blind. In a screw-hung blind the screws can usually be undone sufficiently to allow of enough space to slip the cords over the pulleys.

Old blinds sometimes cause trouble through the cord slipping off the pulleys, caused by the edges of the pulley being broken or by the opening of the slot being too large. The remedy in the first case is to fit new pulleys; they are generally held in place by a pin, which can be withdrawn with a pair of pliers. A new pulley wheel can be fitted in and the pin replaced. In the second case, the best method is to attach thin strips of wood, to provide a guide for the cord. Another method is to drive a staple as close as possible to the pulley so that the position of the cord is always over the pulley no matter how slack the cord is.

VENETIAN GLASS. This phrase is applied primarily to glass made in or near Venice, but also to pieces made in the same style by workmen in other countries. The Venetians discovered the way of making the type of glass since linked with their name in the 13th century, but their furnaces were on



Venetian Blind. Fig. 1. Webbing or tape with ladder pieces woven in. Fig. 2. Method of securing shading tape to bearer. Fig. 3. Blind complete with new tapes and cords, showing laths in position.

within easy reach when the blind is fully down. This is adjusted by securing one end by means of a knot, which should fit in the enlarged hole in the underside of the bottom lath, and then pulling the other end through the hole until sufficient remains on the outside. The spare cord is cut off, the end knotted and pulled into the hole.

With large blinds and those screwed to the window frame, the cord should be threaded through the pulleys and tied while the bearer lath is secured. When the cord has been threaded and secured at the bottom the blind

the island of Murano, being regarded as too dangerous to be in the city itself. The industry flourished until the 18th century, partly owing to the jealous care with which its secrets were guarded. It then fell into decay, but was revived in the 19th century.

The characteristics of Venetian glass are its extreme lightness as regards weight and a slight cloudiness of hue. The general features of the simpler drinking glasses are a very open bowl, a high, often almost conical, foot, with a tolled edge and a stem slight in proportion to the bowl. In the design there is a sense of poise and balance. Engraved decoration is rare, but enamelling and gilding adorn the earlier pieces, which sometimes have diamond-scratched designs.

Early pieces, being extremely valuable, are rarely seen in private collections. The glasses of the 15th century, as they were modelled on silver cups of the Gothic style, have a somewhat heavy appearance, but in the 16th



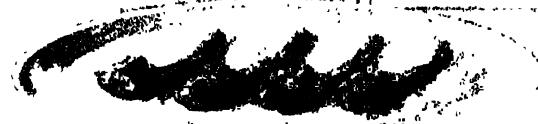
Vanilla Ice



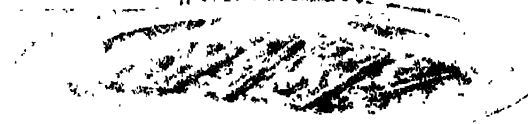
Walnut Meringue



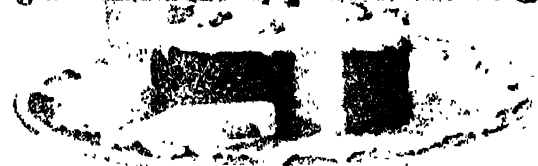
Wedding Cake



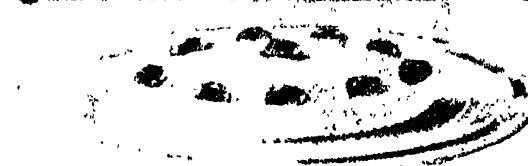
Veal Grenadines



Veal Galantine



Walnut Cake



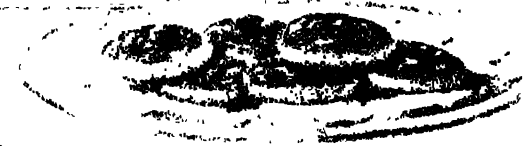
Vermicelli



Whiting



Welsh Rarebit



Welsh Cake

V AND W RECIPES. A SELECTION SHOWN IN COLOUR

Vanilla Ice. See p. 607. *Walnut Meringue*. Take 1 lb. bread-crumbs, 2 oz. sugar, 1 pt. milk, 1 lb. butter, 2 eggs and a little ram, 1 oz. chopped walnuts, 1 lb. whole walnuts. Mix together the bread-crumbs, sugar and chopped walnuts. Boil milk and butter together and pour them over. Add beaten yolks of egg and mix all together. Put layer of paper at bottom of fire dish and pour mixture over. Whip whites of eggs to stiff froth and spread over pudding. Bake in a moderate oven and decorate with walnuts. *Wedding Cake*. See under *Wedding*. *Veal Grenadines*. See p. 557 and under *Veal*. *Veal Galantine*. See under *Veal*. *Walnut Cake*. See under that heading. *Vermicelli*. Put $\frac{1}{2}$ lb. ground almonds in a basin and by degrees pour over them 1 pt. cold water. Turn all into a pan and bring slowly to boil. Strain almonds out of liquor. Boil 3 oz. vermicelli in this liquor (almond milk), add a pinch salt, beat up 3 eggs with 2 oz. sugar. Cool milk a little, add sugar and eggs, and mix in 1 gill whipped cream. Decorate a plain, buttered mould with crystallised fruits and steam pudding from 1 to 1½ in. Serve with almond sauce. For *Welsh Cake*, *Welsh Rarebit*, *Whiting*, see under those headings.



WORCESTER CHINA. SPECIMENS OF A BEAUTIFUL BRITISH WARE

1. Vase and cover, about 1800. 2. Vase, about 1810. 3. Dessert dish, about 1770. 4. Vase, about 1815. 5. Vase and cover, about 1770. 6. Tea-tray, about 1780. 7. Stand for sugar bowl, about 1760. 8. Bowl, about 1765. 9. Vase, with arms of the East India Company, about 1830. 10. Tea-tray, about 1800. 11. Candle tick, about 1830. 12. Scent bottle, about 1830. 13. Plate, about 1810. 14. Beaker, about 1795. 15. Fruit dish, about 1775. 16. Jug, about 1810. 17. Plate with the arms of the Earl of Coventry, about 1800. 18. Vase and cover, about 1820. 19. Bottle and stopper, about 1830. 20. Plate, about 1800. 21. Bottle and stopper, about 1815. 22. Vase and cover, about 1820. *Note for the collector are given under Worcester China*

century more delicate pieces were made, and some of the finest existing examples date from that time. In that period the glass became thinner and lighter, relying less and less on enamelling for its beauty. The filigree was elaborated and different colours were employed. Pieces were also made in the form of lions, dragons, gondolas, etc. The mascaron (q.v.) or raised ornament of glass was often used on vases and bowls. See Glass Ware.

VENISON: How to Cook. Before it is fit for the table venison requires to be hung for two or, if the weather is cold, three weeks.

The principal joints are the haunch, which includes both the loin and the leg, the shoulder, the neck and the breast. Of these the favourite is the haunch, which is roasted and served with rich brown gravy, accompanied by either red currant or rowan jelly. The meat for the greater part of the time it is roasting should be covered with buttered paper placed over a flour and water paste, in order to keep in all the juices and retain the flavour.

To roast haunch of venison, saw off the shank bone, also trim the chine and pare away darkened skin and sinews. It is often necessary to remove entirely the outer skin of venison before roasting it especially if well hung. Cover a large sheet of kitchen paper, and place two more sheets underneath it. Cover the meat with a stiff flour and water paste, roll in the greased paper, and place it with sufficient good beef dripping in a baking pan, and roast it in the oven for from 2½ to 3½ hours.

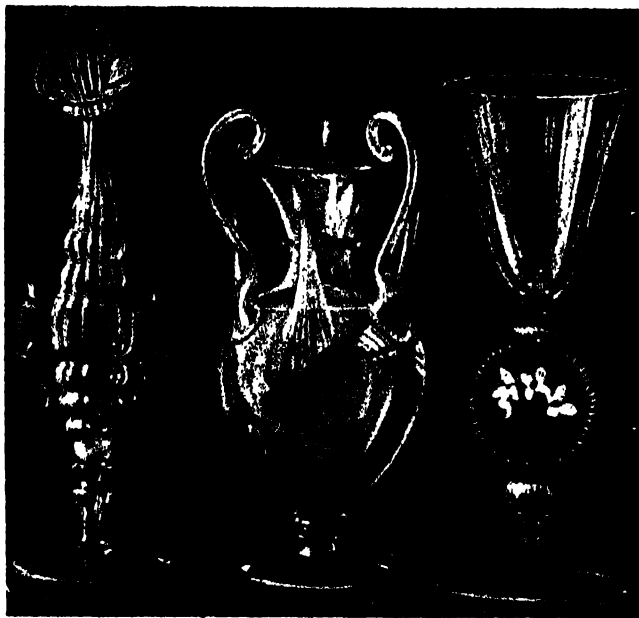
It should cook gently after the first 15 min., and should be well basted several times during the process of cooking. About 12 min. before the haunch is ready, remove the paper and paste, set on the meat with salt and pepper, dredge it with flour, baste it, and expose it to sharper heat to give it a brown tint. When well frothed up and a rich brown, dish up and serve very hot, with gravy in a tureen.

The gravy is made as follows. Chop small the knuckle bone and trimmings off the chine and fry these, with any game or chicken bones left over, in 2 oz. fat, adding 4 prepared and chopped shallots, a bouquet garni, and a shredded stick of celery. Fry all until a pale brown, then add seasoning and 1 gill white wine. Simmer these until they are reduced to a glaze, stirring all the time that the liquor is reducing. Then add ½ pint good stock, mix it in well, and cook very gently for 25 min. The essence is now skimmed and strained through a fine hair sieve. Have ready heated in a saucepan 1 pint good brown sauce and mix in with it the game essence, also the strained juice of half a lemon. Boil all up.

Venison Pasty. For an old-fashioned pasty, bone the shoulder, but as it is snowy beat it well and steep it in vinegar to which 2 glasses port wine have been added, leaving it in this pickle for 24 hours. It is better to rub the joint well with sugar before putting it into the vinegar. Do this for 2 or 3 days. When required for use, be careful that all traces of sugar are cleared away and that the joint is wiped quite dry from the wine and vinegar. Season it with salt and pepper, then lay the boned shoulder in a large earthenware dish.

Melt ½ lb. butter or margarine and pour it over the meat, adding ½ lb. fat from a loin of mutton cut fine. Sprinkle over it a little grated nutmeg, clove or mace, and 12 shallots which have been peeled and chopped. Half fill the dish with good stock, and cover it with a light pastry as for meat pie. Bake the pastry sharply for about 20 min., then slowly for from 3½ to 4 hours. The crust should be very rich, or it will dry in the long baking.

To make a more modern dish, use about 2 lb. of boned shoulder of venison, beat and



Venetian Glass. Three beautiful specimens of white Venetian glass, that on the right having a stem enclosing orange flowers in coloured glass.

soak it, and prepare as for the pasty, but cut it into neat pieces. Lay these in a pie-dish and season well, also dredge them with flour. Arrange among the pieces 12 small rolls of bacon and the same number of forcemeat balls, then fill up with good strong stock into which a wineglass of port wine should be introduced. The pie must be covered with a rich rough puff pastry, and will take about 2 hours to bake. It should be ornamented and glazed. After it is cooked the centre ornament should be removed, and in the vent should be poured as much extra gravy as the dish will hold. Venison dishes must always be served very hot. French beans are a good accompaniment.

Jugged Venison. For this savoury dish bone the shoulder and cut the flesh into neat square pieces, but first prepare the meat by beating it and soaking it. Fry the venison with ½ lb. bacon cut in dice until it is a good brown, then drain off all superfluous fat. Dredge over the meat 3 oz. flour and fry again a few minutes in order to cook and colour the flour. Keep all moving, and be careful that the flour does not burn. Now moisten the contents of the pan with 2½ pints good brown stock and ½ pint port wine. Season well, and add a bouquet garni.

Stir frequently till the whole comes to a boil, and then simmer while preparing the following flavoured: Procure 24 small button onions, peel them and fry them in butter for about

5 min., or until well coloured. Put them with the meat and gravy into a stewing jar, add 24 button mushrooms, and cook all gently in the oven or on the top of the stove, drawn back from the fire, for about 2 hours or until the venison is tender.

When ready to serve, remove the bouquet garni, clear the gravy from fat and scum, and dish neatly garnished with routes of fried bread. Mushrooms suitable for this dish may be procured preserved in bottles, and if button onions are not obtainable a Spanish onion peeled and cut into neat pieces may be used in place of them.

Casserole of Venison.

For a stewed loin of venison, trim the loin and cover the fillet

portion underneath with thin slices of bacon. Tie or skewer these in position, then place the joint in a large casserole with a prepared and sliced carrot, 2 onions, also sliced, a bouquet garni, a piece of butter or margarine as large as an egg, 4 oz. bacon rashers trimmed and cut into strips, 4 cloves, and seasoning. Put the lid on the casserole, and let all cook together.

After it has cooked for an hour add 1 pint stock and continue cooking for at least another hour, still turning and basting occasionally. Dish the meat removing the string or skewers, and keep it hot. Strain the liquor in which it has been cooked and fire it from fat. Add 3 gills brown sauce, a small pot of red currant jelly, a wineglass of port wine, and seasoning to taste. Pour the gravy round the meat and garnish with potato croquettes.

The remains of a cooked joint of venison may be hashed. Place a sliced onion in ½ pt. stock, season, add 1 tablespoonful red currant jelly and boil for a few minutes. Dust 6 oz. slices of venison with flour, add to the stock, etc. and remove the onion. Stew a few prunes with lemon juice to taste. When the venison is heated, place it round the prunes on a hot dish and garnish with sprouts of toast.

The fry of venison makes a good breakfast dish. Wash and soak the fry well, then cut into neat pieces and roll each in seasoned flour. Fry them in butter and dish on fried parsley. See Casserole; Fry; Rowan; Sauce.

THE VENTILATION OF THE HOME

Modern Ideas on a Matter of Vital Importance

This subject has been pursued further in this work under such entries as: Architecture; Climate; Heating; Hot-air; Windows; Cold-air; Draft; Air Conditioning; Refrigeration; etc.

Inefficient ventilation is often a contributory cause of ill health. Unless a room is supplied with ventilators, or the windows are kept open, sufficient fresh air cannot enter. An outlet for impure air is as necessary as an inlet for pure air. Therefore, if there is no chimney, an opening must be made in the wall.

The air of a room becomes impure mainly through the breathing out of the occupants and the carbonic acid gas produced by burning gas lights or oil lamps. Besides carbonic acid, the expired air contains organic matter and watery vapour. A man sitting in a room will breathe out 6 of a cubic foot of carbonic acid gas in an hour. To keep it at a wholesome degree of purity, from 2,000 to 3,000 cubic feet of air should be introduced

per hour for each 1,000 cubic feet of space. The carbonic acid content of the air is important as an index of the freshness of the air, and therefore of the efficiency of ventilation, or, in other words, of the movement of air within the room. The malaise, or sense of illness, which is a consequence of a stuffy atmosphere has been shown to be due to stagnation of air round the bodies of the occupants.

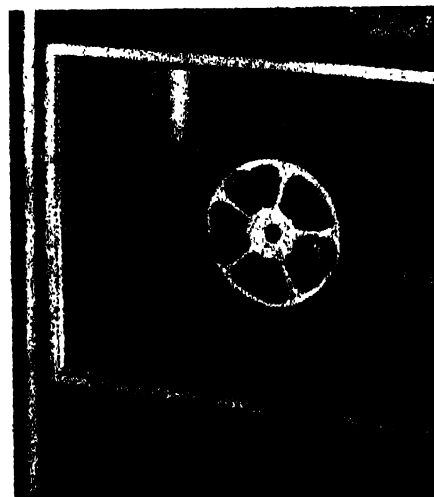
The general result of such stagnation is a diminution or suppression of perspiration, which function is always going on although we may be unconscious of it. The regulation of body temperature is thus interfered with. Equally important is the loss of stimulation of the nerves of the skin, caused normally by the circulation of the air about the skin. The

effect of this stimulation is to produce an exhilarating sense of well-being.

It has been found that average air in town areas contains about 4 parts per 10,000 of carbonic acid gas, the air of a room ought not to contain more than 6 parts. Closely related with this matter is the size of the room. A bedroom for one person should be of at least 800 and preferably 1,000 cubic feet. In calculating the cubic capacity of a room the length, breadth, and height are multiplied together, but any height above 12 ft. is not to be counted, because above that level little change occurs in the air. The floor space is also important, and for that is suggested $\frac{1}{2}$ of the cubic space.

In the climate of Great Britain it is found that the air cannot ordinarily be changed oftener than three times in an hour without the process causing a draught, so that to secure a supply of 3,000 cubic feet of fresh air per hour the room space must be 1,000 cubic feet. A certain degree of draughtiness does not matter so much in a bedroom. A good airing of a bedroom in the daytime is not sufficient, and ventilation during the night also must be provided for. It is usually best to keep a window widely open, there is less draught than when only a small slit is left for the air to enter, as the smaller the opening the greater will be the velocity of the air current. If the bed is not between the window and the fireplace no harm results, as a rule, from the wind blowing through the window on to the sleeper. But if he is liable to neuralgia or toothache he may have to avoid this. With a screen properly placed, full protection can be obtained from draughts.

Using a Sash Board. For ventilating a room a good plan is to raise the lower sash 4 to 6 in. and fill up the open space with a 1 in. thick



Ventilation. Fig. 1. Ventilator consisting of a movable piece of perforated glass fixed to a window pane with similar perforations.

board placed between the sash beads. The lower sash is shut down on to the board, which can be painted to match the window frame. This arrangement allows air to come in between the lower and upper sashes, and as it is directed upward there is no appreciable draught. This is called natural ventilation. Some artificial system may be necessary for sitting-rooms, and may be applied to sleeping-rooms as well. There are many such systems. In some houses one sees a small grating fixed near the ceiling to draw away the hot air. It may be arranged that the air passes into the chimney, a backward current being prevented by a valve.

A good appliance is the Sherringham valve, in which there is a wedge-shaped projection let into the wall of the room, communicating with the outer air and directing the current

of air upward. This ventilator should be placed about 5 or 6 ft. from the floor. Another is the Tobin tube. This consists of a shaft leading up the inside of the wall to a distance of 5 or 6 ft. The lower end communicates with the outer air through an opening in the wall guarded by a grating. Valves are attached to regulate the amount of air admitted. A screen may be placed in the shaft to filter the air from dust, or a coil of hot-water piping to warm the incoming air.

Perforated bricks in the wall also serve to ventilate a room. The openings through these are wider on the inside so as to diminish the force with which air enters. Air movement can be brought about by an electric fan, and if this is placed so that it can direct an air stream in a suitable manner, i.e. towards an outlet, the air is not merely agitated but exchanged.

The Cooper ventilator (Fig. 1) consists of a piece of glass which is perforated with four or five holes of about $\frac{1}{4}$ in. diameter. The perforation is covered with a disk of glass having perforations to correspond with those in the other piece of glass. The disk moves on an ivory pivot which passes through glass and the disk; a stop is also arranged so that the disk will not revolve beyond a certain point, that is, either open or closed. To open the ventilator the disk is turned until the holes of the glass disk and the glass sheet coincide.

With the Boyle type of ventilating radiator fresh air is admitted by adjustable air inlets in the wall and passes through a radiator heated to a suitable temperature, thus providing heat as well as ventilation. This method has the advantage that two objects are served by one piece of apparatus, and there are no objectionable fittings beyond the radiator.

A very simple outlet can be provided by inserting in the external wall a Boyle's mica flap valve. This consists of a metal box having a grid in the front, the inside has a smooth seating on to which fits a piece of mica suspended from the top of the grid. The expired air lifts the mica flap and passes outward. The action cannot be reversed, because any air which attempts to pass through from the outside pushes the mica flap on to its seating. By the use of this appliance good ventilation can be arranged for bedrooms or upper rooms.

The Boyle air inlet panel shown in Fig. 2 is adjustable by opening or closing the flap at the front, which when open directs the entering air in an upward path so that the fullest advantages are obtained from its use.

When a fire is burning and the window is open there is a good flow of air, but if there is no fire the outward current may be very slight. It is a good plan, therefore, if a room tends to get stuffy, to burn

an oil-lamp in the grate, or to light a gas jet in the chimney when no fire is going. This is essential in a sick-room. It must be remembered that gas and oil lamps vitiate the air of a room to a considerable extent, but against this may be set the fact that air currents are caused, which effect an exchange if suitable inlet and outlets exist. Even when a room is large the air will be impure unless there is free and constant circulation and renewal.

Under-floor Ventilation. The ventilation of the space above the ground and beneath

the floor of a house is provided for by building air-bricks or gratings into the outer walls just below the damp course. The sleeper walls, too, on which the joists are supported, are built up in honeycomb fashion, so as to leave a number of interstices through which air can circulate. Unless the under-floor space is well ventilated the timbers and floorboards are prone to the attack of dry rot (q.v.). It is important—though frequently neglected—to ensure that the

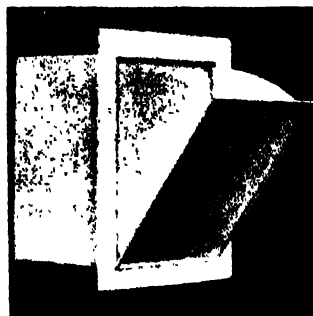
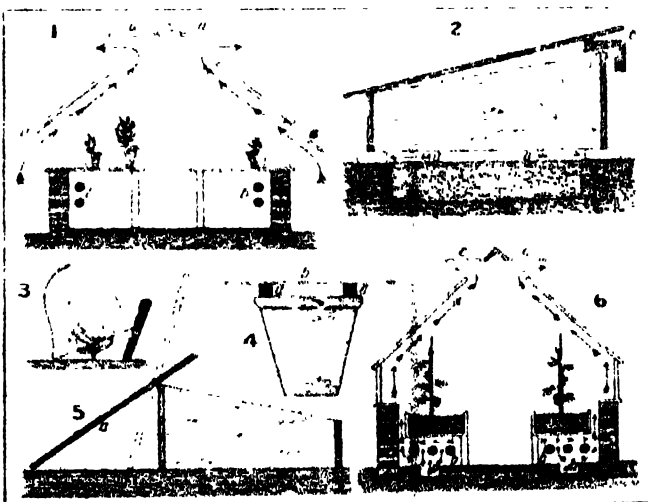


Fig. 2. Boyle air inlet panel.

ventilating bricks or gratings should not be obstructed on the outside by earth, plants, etc.

VENTILATION: For Plants. In the greenhouse ventilation is of supreme importance, for whilst the glass will rapidly conserve and bottle up sunshine, it will not readily allow the accumulated heat to escape. Too much fresh air cannot be given from the middle of May to the middle of September. During April and the early days of May more care is necessary, owing to weather vagaries.

In winter, ventilation should be allowed whenever the air is mild, opening up during mid-morning and always closing down between 2 and 3 p.m. When the air is very dry or very cold, ventilation should be reduced to a minimum, and unless heat is available to give it warmth before entrance, top ventilators should be opened in preference to those at the sides. Another point to remember is that ventilators must be opened to leeward and closed when the wind direction changes. During spells of very severe weather ventilation must be restricted to an hour, or even less. It is a safe rule to open top ventilators first, following, when necessary, with the lower ones, but always



Ventilation: for plants. 1. Greenhouse ventilation: a, lights; b, pipes; arrows denote direction of air currents. 2. Frame ventilation: a, bricks; b, light block. 3. Cloche ventilation. 4. Pot ventilation: a, sticks; b, glass. 5. How to remove top light, a, of a frame, the dotted lines showing insecure method of standing after removal. 6. Ventilation of a forcing house: a, flues; b, pipes; c, lights; arrows denote air circulation.

opening them on the same side of the house. Sliding lights are now out of date, and in modern houses the runs of ventilators are levered open to any desired aperture at one time, separate levers controlling top and bottom. Another important detail is provision of holes in the brickwork to admit air, where it will be forced to pass around the hot water pipes as shown in the diagram; this arrangement is usually adapted to large houses, but it may very well be arranged in those of smaller type. Ventilation of garden frames is often necessary, and our sketches show simple and effectual methods.

VENUS'S FLY TRAP. The plant to which this name is given is a greenhouse herbaceous perennial with white flowers. The leaves are edged with sensitive teeth, which are said to close up and interlock when a fly or other insect alights upon them. As soon as the insect is dead the leaf reopens. The plant, popular only as a curiosity and for collection, is grown in equal parts of peat and sphagnum moss. Latin name, *Dionaea muscipula*.

VENUS'S LOOKING GLASS. The best-known species of this hardy annual flowering plant is *Specularia perfoliata*, which grows 1 ft. high, with oblong or lance-shaped leaves, and purple flowers in July. It will thrive in any fairly good garden soil in a sunny bed or border.

VENUS'S NAVELWORT. This name describes a small group of low-growing plants suitable for the rock garden. One of them, *Omphalodes lineifolia*, is a pretty hardy annual, 10 in. high, with white flowers in late spring or summer from seeds sown out of doors in autumn and spring respectively. It needs rather light soil and partial shade. Of the perennial kinds the best are *cappadocica*, *verna*, and *lucida*.

VERANDAH. In its usual form a verandah is a raised covered extension from an outside wall of the house. In some styles of architecture it is a special feature of the building. A certain type of Victorian villas, for instance, have long narrow verandahs, situated a few steps above the ground level. The chief drawback to this style is that it darkens the rooms opening on to the verandah, with its curved iron roof, trellis, pillars and railing all obscuring the light; also it is not wide enough to afford the compensation of being a useful open air sitting-room.

In more recently built houses of corresponding size the comparatively spacious bricked, tiled or paved loggia has largely supplanted the old-fashioned verandah. The latter, however, in a wider form is a convenient extension over a porch or in conjunction with a large balcony on an upper floor.



Verandah, Constructed of timber and glass, this first floor verandah with its comfortable furnishing forms a pleasant sun parlour
Humphrey & Vera Jock

When constructed of timber and glass after the manner of a conservatory, as shown here in our illustration of a first floor verandah, it forms a sun parlour. Sections of its glazed front wall are movable and the glass roof does not darken the adjoining living-room. See Conservatory Garden Furniture: Glass Loggia.

VERATRUM. This is a vigorous hardy herbaceous perennial plant with large leaves and flower spikes which reach to a height of 3 ft. to 4 ft. It is suitable chiefly for the wild garden or large herbaceous border. It flourishes in ordinary well-tilled and manured soil. The chief kinds are album, 3 ft., greenish; nigrum, 3 ft., dark maroon; and viride, 4 ft., greenish: all bloom in summer. The rootstocks have poisonous properties and hell-bore powder, used as an insecticide, is made from the roots of *Veratrum viride* and album.

Verbascum. This is the botanical name for the border plants known as mullein (q.v.).

VERBENA. This is the name of a popular half-hardy plant which is largely grown for use in summer flower beds. There are several named varieties, of which the prettiest is the pink one named Mrs. Willmott, but a packet of mixed seeds will provide flowers of brilliant and varied colouring. If these are sown in a heated greenhouse in Jan. or early Feb. the plants will bloom in summer. They must be grown in a compost of loam, leaf-mould and sand and gradually hardened off for planting out in June. Cuttings may be taken in August and inserted in pots of sandy soil in a frame.

Verbenas make charming summer flower beds and yield a wealth of bloom if the shoots are pegged down. *Verbena venosa* bears blue-purple flowers. *Verbena chamaedrifolia*, which is suitable for the rock garden or a sunny border of light soil, has scarlet blooms.

VERDIGRIS. This is a green or greenish blue substance formed by the action of an acid on copper and on metal alloys containing copper. It is used as a stain and a dye, and for this purpose is produced by subjecting copper to the action of acetic acid.

Articles made of brass are liable to the formation of verdigris, which can be removed by dipping in a strong potash solution. Hydrochloric acid in a weak solution can be used for removing verdigris from articles of rolled gold, and, unless plated articles are badly coated, when the above method can be used it will be sufficient to wash them in strong soda water. Sub-acetate of copper or verdigris can be employed as a green stain by dissolving it in a hot solution of vinegar. It is also employed in making an ebony stain. See Brass; Bronze; Bronzing.

VERGE. In gardening operations the straight or curved edge of a lawn is known as the verge. It has to be kept clean and true after the mower has cut the grass as near to the boundary as possible. An edging iron is the best implement to employ, aided by a garden line stretched from end to end of lawn.

There is also a machine called a verge cutter, which trims off all projections of lawn edges. This cutter is supplemented by a knife blade, which requires frequent sharpening. See Lawn.



Verbena. Flowers of the pink variety, Mrs. Willmott

VERMICELLI: Cookery Uses. A delicate Italian paste, vermicelli is so called because of its thread or wormlike appearance. It is used for puddings, sweets and savouries; soups are thickened with it, and it forms an excellent substitute for bread-crumbs in the coating of small cuts.

All Italian pastes differ in the time required for cooking them, as if the paste is old or stale it takes longer to soften. Good fresh vermicelli should be done in from 5 to 7 min., and on that account is valuable when time is limited. No Italian paste should be soaked before it is cooked, but just dropped into plenty of salted boiling water, stirred occasionally, and drained off as soon as it is done.

For thickening clear soup, boil the vermicelli as directed above. Have the soup ready flavoured and strained, put the vermicelli into the tureen, and pour the soup, boiling, over it. Use 2 to 3 oz. paste to each quart of stock. For a family soup the vermicelli may be sprinkled into the boiling soup about 10 min. before serving it and stirred till it is soft. This latter method saves the use of extra utensils.

The following is a simple but nourishing dish for children. Put into 1 pint boiling white broth or milk 2 oz. vermicelli, season and flavour to taste, and then boil for 5 min., straining all the time. This should be served with rusks.

Vermicelli Sweets. Vermicelli pudding is steamed, and will take 1 pint milk, the rind of a lemon, 2 oz. castor sugar, 4 oz. vermicelli, and 3 eggs. Infuse the rind of the lemon in the milk for 40 min., adding a pinch of salt, but be careful not to let the milk waste. Then strain out the lemon, and return the milk to the saucepan used for the infusion. Bring it to the boil, and stir in the vermicelli (cooked). Continue stirring over the heat for 4 min., then draw the pan back. Beat the eggs and sugar together, and mix them thoroughly with the milk and vermicelli. Turn into a greased basin, and steam for 1½ hours.

A trifle can be made in this way. Cook 6 oz. vermicelli in salted water, and drain it. Have ready 1½ pints rich custard. Melt ½ oz. gelatine in 2 tablespoonfuls of water, mix this with the custard, and pour both over the vermicelli. Set the mixture in a border mould or in a dish, the centre of which has been filled in with a smaller dish. When firm, turn it out and

arrange it in a glass dish. In the middle of the border place a layer of sponge fingers and ratatouille soaked with sherry. Cover them with red chopped jelly, and heap it in a mound. Then pipe the whole with flavoured and sweetened whipped cream. Finish by decorating with coloured sugars.

Vermicelli Pie. An excellent pie is made with 4 oz. cooked vermicelli, $\frac{1}{2}$ lb. cold meat minced (chicken or veal for preference), 3 or 4 tomatoes, a little grated nutmeg, seasoning, $\frac{1}{2}$ pint vegetable flavoured stock, 4 oz. grated cheese and breadcrumbs. Arrange all these ingredients in layers in a greased fireproof dish, reserving sufficient breadcrumbs to cover the top, on which place small dabs of butter, and bake about 20 min. in the oven.

VERMIN. In English law this word is defined to include bugs, fleas, lice, itch, mites and their eggs, larvae and pupae. The Housing Act, 1936, states that for houses of a certain rental there is an implied condition that the house is at the commencement of the tenancy in all respects reasonably fit for human habitation, and a similar condition is to be found in the Rent Restriction Acts. Therefore if a tenant moves into a house and directly afterwards finds that the house is infested with vermin, he or she has just cause for complaint against the landlord, damages have been awarded in the courts in such cases.

Many large towns, including London, have acquired powers to deal with vermin, verminous rooms and persons by means of local acts; in addition there are particular sections of the Public Health Act, 1936, dealing specifically with vermin, and action can be taken under this act against the persons who cause the vermin. Again, all local authorities have powers given them under the Public Health Acts, enabling them to deal with premises which are a nuisance, and injurious or dangerous to health. Several towns have obtained powers by local Acts to deal with the dirty tenant, and where it is proved to the satisfaction of the court that within twelve months of a room having been properly cleansed they have by neglect and filthy habits made the room verminous a fine may be imposed.

London has considered this subject fully at various times, and borough councils have the right to enter premises, inspect and serve notices in writing upon the owner or occupier of a house or room to have it cleansed within a certain time, and if necessary to remove the paper from the walls for the purpose of destroying and removing the vermin. Failure to do so may upon conviction incur a fine of 10s. a day for every day of failure, or the authority may do the work and recover the costs.

The practical working of this is as follows: A complaint is lodged, or it comes to the knowledge of the sanitary authority, that a house or room is verminous. The sanitary inspector visits and possibly finds the tenant has only been there a short time, obviously then the liability is the landlord's and a notice is served upon him to remedy same. However, if it is found that the tenant has occupied the room for some time and the vermin is caused by his or her dirty habits, then the liability is theirs. Much trouble is caused by people buying old furniture and clothes and importing them into their rooms.

The London County Council has considerable local powers for the compulsory control of vermin. On the report of the medical officer of health that a person and clothing is infested with vermin, and such person will not consent

to be removed to a cleansing station, the court, if satisfied with the application of the local authority, may order his removal and detention. The local authority may take such measures as necessary to free him and his clothing from vermin. Females are protected, inasmuch as the examination of such must be carried out by a woman or a doctor. No charge is made for this personal cleansing.

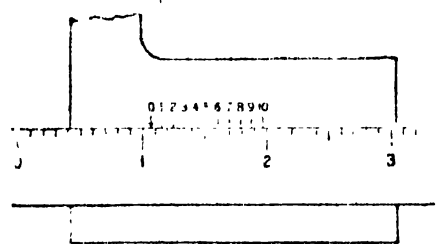
The Children's Act, 1908, gives the school medical officer and nurse power to examine children, and if it is found that such children are infested with vermin or in a foul or filthy condition, the local authority can give the parents or guardians of such child a notice in writing requiring them to cleanse properly the person and clothing of the child within 24 hours of the receipt of the notice. Failure to do so gives the officers power to remove the child and detain him or her till they are satisfied that the child is properly cleansed.

VERMOUTH. The mild cordial known as vermouth is made from white wine flavoured with wormwood and certain vegetable extracts. It is used mainly as an aperitif before luncheon and dinner and as an ingredient in several cocktails. A favourite appetizer is a French and Italian vermouth mixed half and half.

A vermouth cocktail is made with two dashes of Angostura bitters and one portion of Italian vermouth, filled with ice, mixed and strained into a cocktail glass. Another cocktail is made with three dashes each of Maraschino and Angostura bitters. Add one portion of Italian vermouth, fill with ice, mix and strain into a glass, the rim of which has been moistened with lemon peel and then dipped into some powdered sugar. See Cocktail.

VERNIER: On Calipers. This is a device applied to a scale to give accurate readings in fractions of the smallest division of the scale. It is used on micrometers, caliper gauges, and scientific instruments that are designed to work very exactly.

A sliding caliper vernier is shown in the accompanying illustration, as engraved on the sliding jaw. The scale on the shaft gives measurements in tenths of inches. The vernier scale has ten divisions, together equal to nine



Vernier. Diagram of portion of a scale, reduced, showing a measurement of 1.07 in. See text.

divisions of the scale; each therefore representing $\frac{1}{10}$ of $\frac{1}{10}$ of an inch. In the illustration the zero mark of the vernier has passed the inch mark of the scale, but has not reached the next $\frac{1}{10}$ inch mark. To decide the value of the fraction the vernier is consulted, and its 7 line is found to correspond exactly with a scale mark. The 6 line of the vernier is $\frac{1}{10}$ of $\frac{1}{10}$ inch to the right of the nearest scale mark on its left; the 5 line, $\frac{2}{10}$ of $\frac{1}{10}$ inch, and so on to the zero mark, which is $\frac{7}{10}$ of $\frac{1}{10}$ inch beyond one inch. The reading therefore is 1.07 inch. A finer reading could be made if the vernier scale had 20 divisions equal to 19 of the scale, as the difference would then only be $\frac{1}{20}$ of $\frac{1}{10}$ inch.

The vernier incorporated in a micrometer gauge is essentially similar in principle, though the scale is engraved around the thimble of the gauge. See Gauge; Micrometer.

VERNIS MARTIN. A brilliant lacquer or varnish used in the painted decoration of articles such as fans, fancy tables, and cabinet panels, takes its name from a French family who, during the 18th century developed a form of artistic decoration based on oriental lacquer work. See Lacquer; Watch.

Veronica. Hard and half-hardy evergreen flowering shrubs and perennial plants popularly known as speedwell (q.v.).

VERTEBRA. The spinal column is composed of a large number of separate bones superimposed one on the other, the object of such an arrangement being, of course, to secure flexibility. Typically, a vertebra consists of a mass of bone in front, the body, and a bony arch behind. The first cervical or neck vertebra, known as the atlas, the one on which the skull rests, does not possess a body, but consists simply of a ring of bone. The next one has on the upper surface of the body a long tooth-like process which engages in the front part of the ring of the atlas. The object is to permit of rotation of the head.

The bodies of the vertebrae are separated from each other by disks consisting of fibres and gristle. These, known as the intervertebral disks, increase the elasticity of the spine. The arches placed one over the other and the broad ligaments connecting the vertebrae form the spinal canal, which contains the spinal cord. The five sacral vertebrae are



Vetch. Dainty rose-pink flower clusters and vetch-like leaves of *Coronilla varia*.

fused to each other in adult life, forming a single bone, and the same is true of the four cervical or tall vertebrae. See Spine.

Vertigo. See Bivalves.

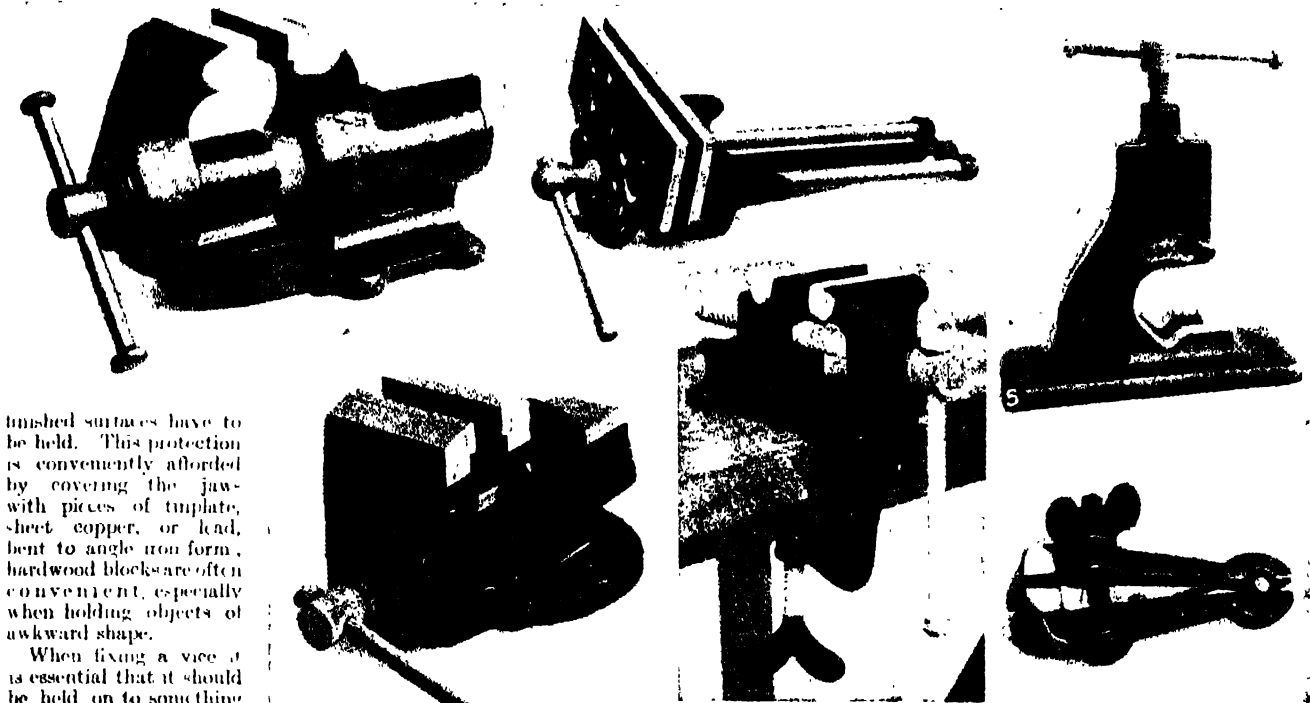
VETCH. Plants with small pea-shaped flowers, vetches are of little decorative value. *Vicia fulgens*, of slender climbing growth, has red flowers in summer. *Vicia faba* is the broad bean. *Coronilla varia*, 2 ft. high, has vetch-like leaves and rose-pink blooms.

VIBURNUM. This is a family of beautiful hardy flowering shrubs, with white flowers. Most of the species are deciduous, or summer-leaving, while some are evergreen. See Guilder Rose; Snowball Tree.

VICE: Different Types. The principal requirements in a vice are strength, rigidity, and a tight grip. Vices are made of many patterns, each specially suitable for some particular class of work, but the type in Fig. 1 is the most useful when a single tool has to be depended on for jobs of all kinds.

One jaw is fixed while the other is moved in or out as required by a screw mechanism concealed in the body of the vice. The screw is turned by a tommy bar which can slide through a hole in the projecting head of the screw, and has knobs on its ends to prevent it from dropping out. In addition there is a spring catch at the side, a touch on which frees the screw mechanism so that the vice can be open or closed rapidly by hand, the screw mechanism being then used for the final closing of the jaws tight on the job.

The jaws of a vice are serrated and hardened in order to provide a good non-slipping grip, and therefore some protection is needed when



Vice. Fig. 1. Engineers' bench vice for heavy work. Fig. 2. Small but useful bench vice for the amateur worker. Fig. 3. Portable bench vice which can be attached to bench, table, etc. Fig. 4. Woodworker's metal vice with quick-grip jaws. Fig. 5. Pipe vice for gripping tubing. Fig. 6. Small vice for holding in the hand.

finished surfaces have to be held. This protection is conveniently afforded by covering the jaws with pieces of tinfoil, sheet copper, or lead, bent to angle iron form, hardwood blocks are often convenient, especially when holding objects of awkward shape.

When fixing a vice it is essential that it should be held on to something very rigid, as any movement, however slight, is most objectionable, especially when filing. If the available bench proves to be unsteady, it can generally be improved by screwing wooden battens, say, 2 in. by 1 in., diagonally from the bottom of one leg to the top of the second all round the bench and screwing the legs to the floor with angle brackets.

In choosing a vice the first consideration is the purpose for which it will chiefly be required. If heavy work is to be done, such as forging or smith's work, then one of the regular blacksmith's leg vices is essential, but for the repair of a car or for bending heavy metal the regulation engineer's vice shown in Fig. 1 should be chosen. The width of the jaws should preferably be about 3½ in., and the opening up to about 6 or 7 in. This class of vice must be securely bolted to a strong and rigid bench. For lighter work, a vice of the pattern illustrated in Fig. 2 is suitable. It is made of cast iron from 1½ to 3 in. wide, and is not, as a rule, provided with quick release mechanism. It is screwed to the top of the work bench with stout wood screws.

For occasional use, the portable bench vice in Fig. 3 has many advantages, chief of which is the provision of a self-contained clamp with clamping screw which enables the vice to be attached to the work bench, kitchen table, or other convenient means of support. If the vice is to be used for any length of time, a couple of wood screws can be inserted in addition to prevent it shifting.

Woodworker's Vice. For woodworking, a joiner's or carpenter's vice, as shown in Fig. 4, is usually most serviceable. It is made in several sizes, usually with a quick release mechanism. This comprises a small trigger, located near the screw handle, the action being to press the trigger and pull the vice-jaw in or out to its approximate position, then release the trigger and tighten up the vice in the usual way.

These vices have smooth faces to the jaws, and can often be used with wooden faces which can be screwed in position when they are needed, holes being provided for that purpose. This type of vice is attached to the underside of the work bench with the upper edges of the jaws flush or slightly below the

surface of the bench. It is imperative that the vice should be securely fixed, as by the use of coach screws or by bolts with the heads recessed below the surface of the bench and the holes properly plugged with wood.

When circular work is to be dealt with, a pipe vice like that illustrated in Fig. 5 is the best. It consists essentially of a horizontal sole plate or base with an upright portion upon it, through which works the jaw with a V-shaped end. This slides in a passage way formed within the base and closes down to a slot in the lower jaw, which is similarly V-shaped. When the handle is turned, the jaws are forced together and the pipe is securely held. As such a vice is subjected to considerable twisting strains it must be bolted to a rigid bench.

In addition there are the various hand vices, ranging from that shown in Fig. 6 down to the jeweller's pin vice designed to hold fine wire while being worked. Some forms of the last named resemble a chuck in shape and action. A useful pattern for the amateur is the hand vice shown in Fig. 5. It is virtually a small

vice with a long extension piece on the opposite side to the jaws, these being hinged together. This part of the vice can be held in the hand, the work being grasped between the jaws by tightening up the thumbscrew. A considerable range of work can be dealt with by such instruments and they will often take the place of a bench vice, in cases where it is not practicable to take the work to the bench.

Vices as a rule do not receive sufficient care and attention. Except in the very heaviest patterns the vice should not be used as an anvil. The screw and the working portions ought to be lubricated from time to time so that they may work freely and easily. In this connexion it is well to clean out the screw and screw thread of the moving part occasionally by washing them out with paraffin, brushing away any chips or grit, and thoroughly oiling. If the permanently fixed vice shows any sign of working loose it should at once be made secure, by tightening the holding-bolts, or by removing the screws, plugging the holes, and rescrewing. See Hand Vice.

VICTORIAN STYLE IN BUILDING & FURNISHING

Its Distinctive Features and its Good Craftsmanship

The central action on the Adam and Regency Styles may be referred to as immediately influencing the development of early Victorian decoration and furniture. See also China; Davenport Table; Dr. Stone Table; Jacobean Style; Jewelry; Paper Mache; Sheraton; Tapestry; Needlework; Tudor Style; Wood Carving; Wood Turning.

Much that was cumbersome, badly proportioned, crude in colour and ornament, lacking in appropriate design and in meaning is associated with the decorative art and architecture of the Victorian era. It should, however, be remembered that the period was a long one, and its sixty-four years are generally divided into Early, Mid and Late Victorian phases by certain marked features and developments.

The first of these phases was chiefly characterized by a continuation of the classical revival started at the end of the 18th century and emphasized in the Adam and Regency styles. In the Mid-Victorian phase there was a great medley of the so-called artistic in

ornament and design combined with keen commercialism. The rise and prosperity of the middle classes was accounted for by the huge output of the factories which in turn led to the amassing of material possessions as evidence of social standing. After the Great Exhibition in 1851, china and glass ware factories and all the furnishing trades poured forth a stream of goods, and quantities were also imported, in which domestic comfort and the new mechanical processes were supposed to be allied to artistic designs. In the last Victorian phase reproductions of Tudor houses, Jacobean, Queen Anne and Sheraton furniture were in vogue. These were usually distorted with affectations of the day and stereotyped ornaments.

Machine-cut decorations glued on to so called Chippendale pieces took the place of hand carving. In the early phases colours were bright and designs were naturalistic. In the nineties curiously conventional designs and "art" shades, lacking in purity of colour, were the fashion. The vast accumulation in most homes of unnecessary accessories, draperies and heavily framed pictures reached a feverish pitch. Many things of beauty, old and new, might be included in the furnishing of a room, but owing to lack of tasteful display and the jumble of other shapes and colours, their decorative value was lost.

Domestic Architecture. Victorian architecture of the first two phases owes its character to two main influences. The classical style of the preceding period and the Gothic revival which was fervently advocated by Pugin, the prominent architect who designed many churches, was connected with the planning of the Houses of Parliament, and whose woodwork in the House of Lords is one of the really considerable artistic achievements of the early Victorian years.

Most of the public buildings and many large dwellings of the period are marked by badly proportioned pseudo-classical or Gothic features, while most of the small terrace houses were very ugly in design. In the towns the dominating consideration was a so called elegance and gentility. Typical Victorian houses are from three to five storeys in height, faced with stucco, and almost invariably adorned with a columned portico surmounted by a balcony, of which a narrower extension is carried to the boundaries. The windows are of the sash variety and the roof of slates. Balcony parapets are generally of wrought iron in a straight or curved pattern, but the square portion over the portico is often composed of stone pillars, carved or bulbous, supporting a flat entablature.

To these houses there is usually attached at the side of the entrance, an area, with stone steps descending to the basement and servants' entrance. Even in comparatively small houses of this type the pretentious portico is added to on a reduced scale.

Above the solid front door there is usually an oblong fanlight. This often consists of fully proportioned panes of glass, whereas the fanlights of the Georgian period were works of art when completed by grilles of scrolled iron work. The hall is narrow, and, once past the foot of the main staircase, continues in a narrower passage to the top of the kitchen stairs.

Distinctively Victorian features of the dining room on the ground floor and the double

drawing room divided by doors or by a heavily curtained archway, on the first floor are the substantial marble mantelpieces. The first flight of the stairway, up to the drawing room, is broad, with stone or wide oak steps. The flights diminish in width with each successive stage, culminating in the steep and narrow wooden staircase to the attics.

In the short transitional period before the Tudor revival in suburban and rural districts a type of house was built in town and country that was free from the worst faults of Victorian classicism. Round arched windows are often a feature of these façades, and verandahs were another, steps leading up to these and to the front entrances. There is neither a semi-basement of this depressing feature is absent. The portico is also absent, the front door being merely recessed with a semicircular fanlight above it. The door usually has four panels, the two upper ones being sometimes glazed and covered with a wrought iron grille.

The ceilings of most Victorian rooms are lofty, and there is a good deal of ornamental moulding. Structurally, the Victorian house is often far better than its modern counterpart, the woodwork especially being of greatly superior quality.

Victorian Furniture. Much of the early Victorian furniture was superbly made. The more solid pieces were of mahogany and designs were gracefully curved. Cabinet making retained the excellent quality of the preceding period. Carving was little used, but mouldings were introduced and plain panels showed off the grain of the fine wood to advantage. In contrast to the plain mahogany pieces which included wardrobes, sideboards, large

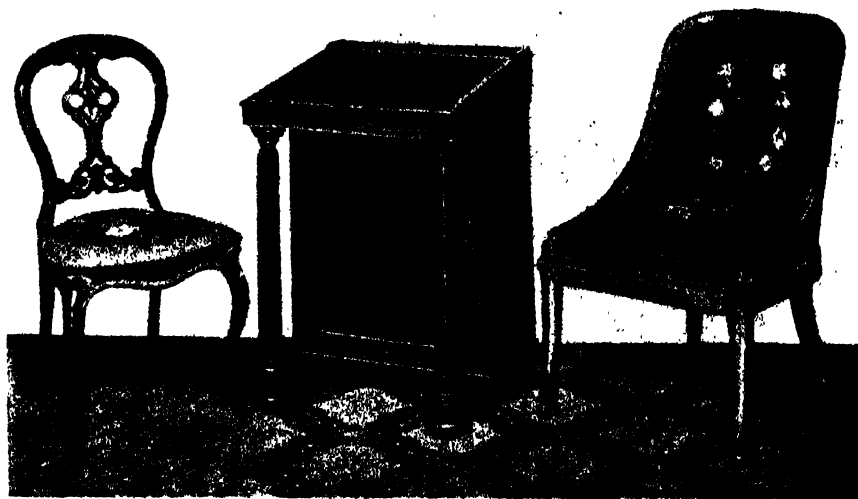


FIG. 2. A mid-Victorian bedroom chimney piece. The illustration affords an excellent example of the once prevalent fashion for a medley of discordant pieces and patterns.

book-cases and writing tables, were the drawing-room pieces: chairs with gilded or ebonized frames, fine cabinets, writing tables and book-cases, walnut chiffoniers and what-nots, interesting small tables, couches and sofas, all of which pieces continued to be made in Empire and Regency styles with brass mountings and decorated with inlay and marquetry or with burl work. Many charming small pieces were made in papier mâché, japanned black, delicately painted and inlaid with mother-of-pearl.

Conventions governing the choice of furniture for different rooms were much stronger than they are to-day. Solidity was the keynote for the dining room in the mid and late Victorian phases, and so the dining-table had to be of large and heavy structure in keeping with the sideboard, which often measured 8 or 9 ft. in width, was topped by a heavily framed mirror, and had drawers and capacious cupboards below. Victorian dining-tables of the early period were often circle topped, but later they were fitted with an interleafing arrangement. Even without the extra leaf or two specimens still in use generally occupy a great deal of floor space. These are oblong in form for the most part, having solid bulbous legs attached at the four corners, the last being rounded. Dining-room chairs are leather covered, the backs being slightly sloped. Every thing in this room was of plain and aggressively formal design, but much pattern was introduced into the decorative scheme by the wallpaper, the curtains with festooned pelmets, draped portières, chimney pieces also draped and crowded with ornaments and an array of Sheffield or silver plate on the sideboard, including probably a massive tea-tray and urn.

Pianos were mostly of the cottage type with pleated silk backings to tracery panels in wood, but immense grand pianos were also seen with cases of mahogany, walnut or rose



Victorian Style. FIG. 1. The two charming examples of Victorian chairs are covered with wool tapestry needlework. The davenport writing desk was a characteristic piece of the period.

wood. Another musical feature often to be found in the early Victorian drawing room was a handsome gilded harp. Gilding was much to the fore in the decorative scheme as the walls were sometimes literally covered with pictures in heavy gilded frames, all of one pattern irrespective of the size and style of the painting. For common use chairs and sofas were upholstered in horsehair, but finer pieces were covered in damask, striped satin, brocade or tapestry needlework. Two quite charming examples of the last are seen in the chairs in Fig. 1. Shown with these is a neat little davenport writing desk of the period.

In the middle of the 19th century a walnut fashion arrived and some excellent furniture was made in the Italian and Spanish varieties of this wood. The former was particularly favoured for wardrobes and other bedroom pieces, as the grain is close and the surface takes a high polish. After this time furniture makers became obsessed with the ante, and many hideous sets of furniture for drawing room, dining room and bedroom were designed, and so well made that they still exist almost unimpaired.

Early Victorian bedrooms in well-to-do households were charmingly and suitably furnished. They were characterized by clear bright colour, crisp silks, chintzes and muslins for curtains, bed and dressing-table draperies, and usually excellent carpets with floral patterns or wreaths on dark grounds. Woodwork was painted in colours to which the polished mahogany furniture formed an agreeable contrast.

With the late sixties arrived the large and cumbersome suite, the stuffy upholstery and the heavy curtains. Bedrooms as well as sitting-rooms were crammed with superfluous ornaments. Fig. 2 is a good example of the bedroom chimney piece of the mid-Victorian period, and also of the chaotic effect of too many patterns so characteristic of the day. A charming little papier mâché table is doing duty as an empty grate screen, but it cannot be appreciated with the designs of the pierced fender, ugly tiles, and floral brocade drapery fighting against it, while the domes of wax flowers in turn kill the delightful pieces of Staffordshire pottery.

While many of the productions of the art crafts were as inartistic as are some of the specimens turned out to day, and as some have been in most other periods, the Victorian output of these things was so vast that collectors are now finding much that is delightful and amusing among the treasures preserved particularly from the earlier work. Examples are also being widely copied. Apart from the undoubted beauty of the Victorian papier mâché work and exquisite coloured glass, minor crafts were admirably executed. Paper patchwork (see page 902), which was popular in the previous century, had a continued vogue and also had needlework and tapestry pictures. The Berlin woolwork of a later phase was crude in colour and design.

Beadwork in coloured glass beads was introduced into upholstery covers and widely used for fire screens and purses. Silhouettes and tinsel work pictures of early Victorian theatrical celebrities are now eagerly sought in curio shops, as also are the pretty or quaint specimens of Victorian jewelry, the tea caddies and intricate workboxes. The gay colours and ingenious patterns appeal to modern tastes, and certain of the pieces and ornaments discreetly chosen look particularly well in the plain settings of to-day.

VICTORIA PLUM. One of the best plums in cultivation is the Victoria, which succeeds well in pyramid, standard, or bush form, and will give good crops on a west wall.

As a preserve fruit the Victoria is unrivalled; even the thinnings of green and immature

fruit make excellent tarts. Unfortunately this variety is subject to the silver leaf disease, for which there is no cure. See Plum: Pruning.

VICTORIA PUDDING. This usually makes an excellent substitute for the more expensive kinds of Christmas pudding. When intended for that purpose it is a good plan to add $\frac{1}{2}$ lb. raisins and two or three apples minced.

Boil together $\frac{1}{2}$ lb. potatoes and the same quantity of carrots. When they are tender chop them very finely, add to them $\frac{1}{2}$ lb. finely chopped beef suet, $\frac{1}{2}$ lb. flour, $\frac{1}{2}$ lb. cleaned currants, $\frac{1}{2}$ lb. brown sugar, and lastly a little spice or grated nutmeg. Mix all well together and press the mixture into a well greased mould or basin. Cover it with a cloth, put it in a pan of fast-boiling water, and boil steadily for three hours, or longer. Turn out to a hot dish and serve with any good sweet sauce. See Sugar.

VICTORIA SANDWICH. Beat 2 eggs and 4 oz. castor sugar for about 10 min., then stir in $\frac{1}{4}$ oz. melted butter, afterwards folding in gently $3\frac{1}{2}$ oz. flour, and 1 teaspoonful baking-powder. Turn the mixture into two greased shallow tins, and bake in a hot oven for 10 min. When cold, spread with jam or cream.

VICTORIA WATER LILY. Often called the royal water lily, this is the magnificent aquatic plant scientifically known as *Victoria Regia*. Its cultivation is quite beyond the scope of amateurs, but under suitable conditions splendid specimens have been raised from seed in Great Britain. See Lily: Water Lily.

VICUNA CLOTH. Very little of the cloth bearing its name comes from the soft, and expensive hair of the vicuna goat. It is a yarn, generally dark cloth finished in a particular manner.

Vienna Bread. This term describes a light milk bread prepared with Vienna flour, and is also known as French bread. See Bread.

VIENNA CREAM. Beat $\frac{1}{2}$ pint milk and 1 tablespoonful castor sugar in a small saucepan, and bring to a boil almost to boiling point. Then strain in $\frac{1}{2}$ oz. leaf gelatine previously dissolved in about 3 tablespoonfuls hot water, add vanilla or other flavouring to taste and enough cochineal to give the whole a pretty pink colour. Pour the mixture into a flat dish, allowing the jelly to measure about $\frac{1}{2}$ in. in depth, leave it to set, and then stamp it into neat rings with two plain cutters, one slightly larger than the other.

Have ready $\frac{1}{2}$ pint clear wine or lemon jelly, coat the inside of a mould with it, and when it is set decorate the bottom and sides with the rings of milk jelly, arranging them as tastefully as possible, and setting them in place with a few drops of the clear jelly. When these, too, are firmly set, fill the centre of the mould with a cream filling made as follows.

Dissolve $\frac{1}{2}$ oz. leaf gelatine in 3 or 4 tablespoonfuls hot water and then add 1 tablespoonful castor sugar. Whip up $\frac{1}{2}$ pint cream, and when the gelatine mixture has cooled strain it in, mixing it thoroughly. Stir in also 2 tablespoonfuls chopped glacé cherries and half that quantity of chopped glacé pineapple and then turn the mixture into the decorated mould, being careful not to disturb the rings. Leave the whole to set, and then turn it out carefully on to a glass dish.

VIENNA ICING. A good recipe for this soft icing, which can be used for decorating fancy cakes, is 4 oz. butter to 10 oz. icing sugar, a quantity of black coffee essence or vanilla essence to taste, and $\frac{1}{2}$ gill rum, brandy, liqueur, or sherry. The butter is better if unsalted, and the sugar should be passed through a fine hair sieve. Work the butter to a cream, then add the other ingredients

by degrees. When the icing is ready it should look like cream and can be used as a filling for a layer cake or Victoria sandwich. See Cake: Icing.

VIEW FINDER. Every camera should be fitted with an attachment by the use of which the photographer can ascertain precisely what part of the view at which he is pointing his camera will be included on the plate or film. This attachment is known as a view finder and may take one of three forms.

The most common and least useful is that found on the great majority of small hand cameras used by amateurs, called the brilliant view finder. The amateur who wishes to produce anything more than snaps of varying success should discard it.

The image it produces is so small that it is impossible to see any detail in the picture, or to gain any clear idea of its composition, as it would be seen on the film or focussing screen. Again and again the amateur who relies on the brilliant view finder with its tiny image will find that his film is spoiled by some prominent object which he had not noticed, glaringly out of focus in the foreground.

Perhaps its most serious fault is that its use entails holding the camera about the level of the waist-line—a position which is hopelessly wrong. If a scene is looked at from the kneeling position, it will have a distinctly different appearance when we stand up and look at it in the normal erect position. In the first case, foreground objects possess undue importance, and the whole perspective is partially falsified. Since things are normally looked at from eye level in the standing position, the camera should be made to look at them in that position and not as if the photographer were one of those mythical beings found on old maps with eyes in his stomach.

A much better type is the direct vision finder in one or other of its forms. An example of this is seen in Fig. 1. It consists of a double concave rectangular lens fitted to the top of the camera body in a line with the camera lens. It is of the same proportions as the plate or film used. The view at which the camera is pointed is seen in reduced size, but perfectly clearly, on the inner face of the view finder lens, correct cutting being obtained by means

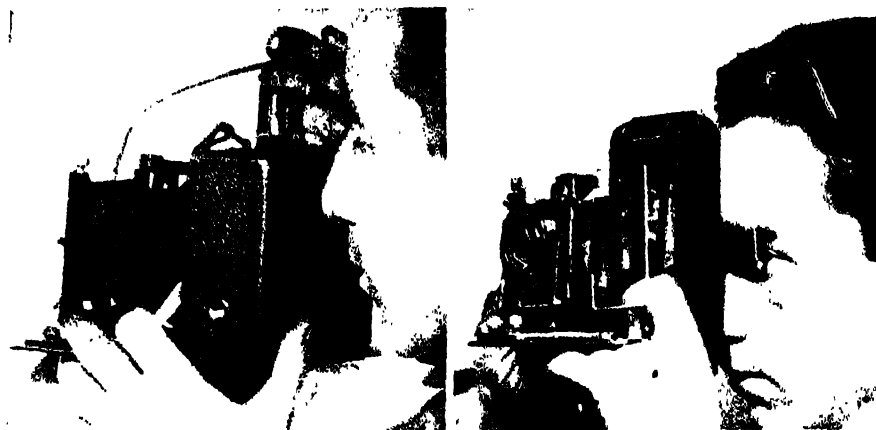


View Finder. Fig. 1. Showing a direct view finder, consisting of a double concave rectangular lens fitted to the top of the camera.

of a sighting pin, at the proper distance away from the finder.

The camera must be held at eye level, as shown in Fig. 2. When using this type of finder the camera is almost bound to be held squarely. The complete fitting folds down on top of the camera, and can be purchased separately and added to most types of folding camera.

Another form of the direct vision finder is the open frame (Fig. 3). Here a wire frame of the same size as the plate or film used is attached to the side of the lens mount. In some patterns it is attached to the top. At



View Finder. Fig. 2. Use of view finder as shown in Fig. 1. When this type is used the camera must be held at eye level. Fig. 3. Wire frame view finder with fixed sighting hole.

the back of the camera a sighting hole is fixed, and by placing the eye to it, as demonstrated in Fig. 3, the exact portion of the view which will be included on the film by the lens is seen. Moreover, the view is seen in its full natural size, so that it can be studied and the viewpoint varied as necessary to avoid ugly foreground intrusions or other undesirable features. This pattern has the additional advantage that, as the frame is attached to the lens mount, its distance from the sighting hole varies with the focussing so that the finder is accurate in all positions.

VINAIGRETTE. This refers to a small box, often made of silver and occasionally of gold with an inner perforated lid that is used for holding a sponge soaked in aromatic vinegar. It was carried in the pocket and the vinegar inhaled as a restorative.

VINAIGRETTE SAUCE. This is made by mixing together 1 tablespoonful of tarragon vinegar, a teaspoonful of cluth vinegar, and 2 tablespoonfuls each of chopped tarragon and chervil. Stir these well in a basin, and season with salt and pepper. See Salad.

Vinca. See Periwinkle.

VINES AND HOW THEY ARE GROWN

Hints on Their Cultivation in Greenhouse and Open Air

This article deals first of all with the varieties of the vine, and then with the culture of its most useful and popular form, the grape. See also Dessert. Greenhouse. Muscat.

Some of the vines are grown for their ornamental leaves, which colour brilliantly in autumn; others, valued for the sake of their fruits, are grown under glass. Although a few varieties of grape vine may be planted on a sunny wall with the prospect of a crop of small grapes in a favourable summer, large, well-flavoured fruits and a reliable crop are assured only by growing vines of proved value in a glasshouse. For planting against a sunny wall out of doors the best variety is Royal Muscadine, which bears small pale yellow grapes.

Haphazard methods will not meet with success in the cultivation of the vine. A border must be prepared just outside the glasshouse by excavating the soil to a depth of 2½ feet. A layer of broken bricks is put in the bottom for drainage and the border is then filled with a compost consisting of three parts of old turf, chopped into pieces about the size of one's fist, and one part of decayed manure, together with a sprinkling of bonemeal or special vine manure. The compost should be trodden firmly. Vines are best planted in autumn. A hole is made low down in the greenhouse wall to allow of the stem of the vine being passed through.

In January the stem is cut back so that it reaches only to the trellis on which the vine is to be trained. In spring two of the fresh shoots are allowed to grow, one being trained vertically up the trellis, the other horizontally along the front of the trellis. No further pruning is required until the following winter, when the past summer's growth is shortened to within 2 ft. of the base. In spring the new shoots at the ends of the two branches are allowed to grow unchecked and a few others are left to form side shoots or laterals, which will produce grapes. The same routine is practised until the available space is filled, the main branches being allowed to progress at the rate of 2 ft. every year and other

shoots being left for fruit bearing. These side shoots ought to be about 18 in. apart on each side of the main stems; it is important that they should alternate with, not be opposite to each other.

Most of the side shoots may be expected to bear bunches of grapes; the tips must be pinched off when two leaves have developed beyond the bunch. This will cause other small shoots called sublaterals to form and the tips of these must be pinched off beyond the first leaf. This summer pruning is most important, if it is not practised the trellis will become a mass of crowded leaves, and there is the

further risk that mildew will set in and the grapes will not ripen properly.

In winter, all side shoots, whether they have borne fruits or not, must be pruned to within two buds of the base of the past summer's growth. If in spring both buds start into growth one of the shoots, the weaker of the two, must be rubbed off. Summer and winter pruning in the way described is an important detail in the cultivation of the vine, and success depends chiefly on its being carried out. As the years pass this hard annual pruning will result in the formation of woody swelling, called spurs, at the base of the side shoots.

Ventilation and Thinning

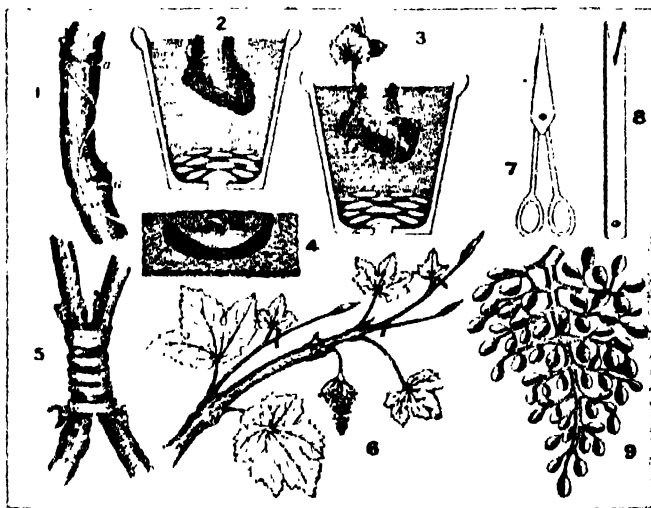
Other details which need attention are ventilation, the regulation of the temperature and thinning the bunches. If the glasshouse is heated, a night temperature of 45 degrees should be maintained in January and one of 50 degrees in February and during the spring months. As the temperature rises out of doors the ventilators must be opened to prevent the glasshouse becoming excessively hot, the amount of ventilation being increased as the day advances if necessary. In the afternoon, an hour or so before the sun has ceased to shine on the roof, the ventilators ought to be closed, at the same time the floor and walls should be syringed. The vine flourishes in a warm moist air except when the bunches are in flower; then the glasshouse ought to be dry and well aired if the weather is mild.

When the grapes are the size of peas they ought to be thinned; this is done by cutting out all the smallest berries and those in the middle of the bunches with a pair of scissors having long pointed blades. A further thinning will be necessary to give the berries room for full development. When the grapes begin to change colour a dry airy atmosphere is again necessary.

If the vine is grown in an unheated greenhouse it will start into growth later than if the glasshouse is heated and the grapes will ripen later in the summer. During dull wet weather great care must be taken to ventilate correctly and to keep the air of the greenhouse as dry as possible to prevent an attack of mildew; it is most important also to attend to summer pruning in the way advised to prevent overcrowding.

The best grape to grow in an unheated glasshouse is the variety known as Black Hamburgh; this variety is also well suited to a heated glasshouse where, however, others may be planted. Those most easily managed are Alicante, Gros Colmar, Madresfield Court and Foster's Seedling (a pale yellow grape). Other first rate grapes which need somewhat skilled attention are Lady Downe's, Muscat Hamburgh, Mrs Pince and Muscat of Alexandria; the last named is a pale yellow grape, generally regarded as the most delicious of all, which requires rather a higher temperature than most others to bring it to perfection.

Propagation. Vines are propagated by eyes or buds. In January a piece of shoot of



Vine. 1. Propagation by "eyes." 2. "Eye" suitably potted with its base in powdered charcoal. 3. Rooting of same. 4. Propagation in piece of turf: the eye is planted with a base of sand and charcoal dust and covered with fine rich soil. 5. Grafting a vine by approach. 6. How to stop shoots: pinching out points shown by thick lines. 7 and 8. Thinning scissors and special stick for thinning. 9. Bunch suitably thinned.

the previous year's growth is cut off; it should be about 14 in. long and contain a bud. If set singly in small pots of light soil, placed in a propagating case in a heated glasshouse and kept moist, these eyes will form roots. They are subsequently potted in small pots and re-potted as become necessary until they are in 8 in. or 9 in. pots. In late summer when growth is complete they should be placed out of doors so that the wood may become well ripened. In autumn the young vine may be planted in a border or re-potted in 12 in. pots in which they will bear fruit. The stems or branches are trained on thick bamboo canes inserted round the edges of the pots. They need similar treatment to that already described. In December all loose bark should be peeled off the vine stems, which must then be treated with a brush dipped in the Gishurst compound preparation; this will help to keep them free from the attacks of pests.

Pests of the Plant. Red spider is a pest which attacks the lower surface of the leaves and disfigures and weakens them; it is most likely to be troublesome in a dry, warm atmosphere. Syringing the lower side of the leaves with salt water, 1 oz. in one gallon of water, is recommended. Moth fly is the most serious pest; it can be killed by using a brush dipped in methylated spirit, but great care must be taken not to touch leaves or buds or they will be ruined.

Mildew is a troublesome plant disease to which vines in an unheated glasshouse are particularly liable. It spreads most quickly in a damp atmosphere; therefore if mildew appears the greenhouse must be kept dry and airy. Affected leaves should be "dusted" with sulphur. Great care must be taken not to let the trellis become overcrowded with shoots and leaves. Summer pruning should be practised in the way already advised.

Ornamental vines are handsome leafy climbing plants for covering trellises, arbours, and pergolas, and the self-clinging *Vitis* (ampelopsis) *Veitchii* is invaluable as a wall covering; its small leaves turn crimson in autumn. The best of the large leaved ornamental vines which become beautifully autumn-tinted are *Coccoloba*, *quinquefolia* (Virginia creeper), *Thompsonii*, *Thunbergii*, *Engelmannii* and *Vitifera purpurea* (the purple leaved vine). *Vitis Henryana*, which has small green and white leaves, is suitable for planting on a wall in mild districts. All these vigorous plants thrive in ordinary well tilled soil.

VINEGAR: Its Uses. Vinegar is a solution of acetic acid in water usually darkened by adding colouring matter. It may be prepared from malt, wine, cider, sugar, wood, and other substances. The ordinary brown vinegar is made from malt. Most French vinegar is colourless, being obtained from the fermentation of light wines.

Besides its use as a table condiment, vinegar is employed in cookery for giving a piquant flavour to savouries and sauces, for dressing



Viola. Fine flowers of this beautiful border plant

salads and for pickling. Various dishes are prepared with it, as, for example, herrings cooked and soured in vinegar. Tough meat is made tender by steeping in vinegar and water before cooking.

It is not difficult to make herb flavoured vinegars at home, and it is useful to have various flavours in the store cupboard. Tarragon vinegar is made thus: To $\frac{1}{4}$ peck tarragon leaves add $\frac{1}{2}$ gallon white vinegar. Leave it in a covered jug for two weeks, then strain it through flannel, return it to the jug. Dissolve in it a good pinch of isinglass in order to fine it. Afterward bottle and cork it down.

For chili vinegar add 1 oz. ground chilies to 1 quart white wine vinegar put it in a covered jar, and leave it for two weeks, shaking it each day, then strain and bottle for use. To make horse radish vinegar scrape 3 oz. horse radish, add 1 oz. shredded shallot and 1 dr. cayenne pepper. Put all into a jar and pour over it 1 quart white wine vinegar. Cover it closely and let it stand for two weeks, shaking it occasionally, then strain and bottle it.

Cayenne vinegar is useful when a hot seasoning is required. Put $\frac{1}{2}$ oz. cayenne pepper into a jar and pour on it 1 pint white wine vinegar. Cover it closely and leave it for three weeks, shaking it every two or three days. When ready, the liquid must be poured off; put into a bottle or strained through a piece of fine muslin.

Orleans vinegar, prepared in considerable quantities in the Orleans district, is a variety of white wine vinegar suitable for table use and for toilet preparations.

Vinegar is considered to help in the digestion of oily or fatty foods. It should, however, be

used in strict moderation, as it interferes with digestion, and may set up irritation of the stomach if taken too constantly or too freely. Vinegar is often taken by the ignorant as a remedy for reducing the weight. It should be clearly understood that its use for this purpose is utterly unjustifiable, as the only way in which vinegar can make one thin is by seriously harming the digestion. See Acetic Acid, Pickle; Salad; Sauce.

VINEGAR CAKE. Take 1 lb. self-rising flour, 4 oz. each margarine, sugar, raisins, and sultanas, 1 teaspoonful bicarbonate of soda, 1 breakfastcupful milk, and 2 tablespoonfuls vinegar. Rub the margarine into the flour, add the sugar and the dried fruit, and then the bicarbonate of soda dissolved in the milk. To these add the vinegar, mix all together, and then bake in a moderate oven for an hour.

VIOLA: The Flower. This is the botanical name of the group that includes the viola or tufted pansy, the ordinary pansy and the violet. Some of the violas are charming rock garden flowers, while the larger-flowered sorts are invaluable for filling spring and summer flower beds. The modern race of large-flowered violas originated by cross-



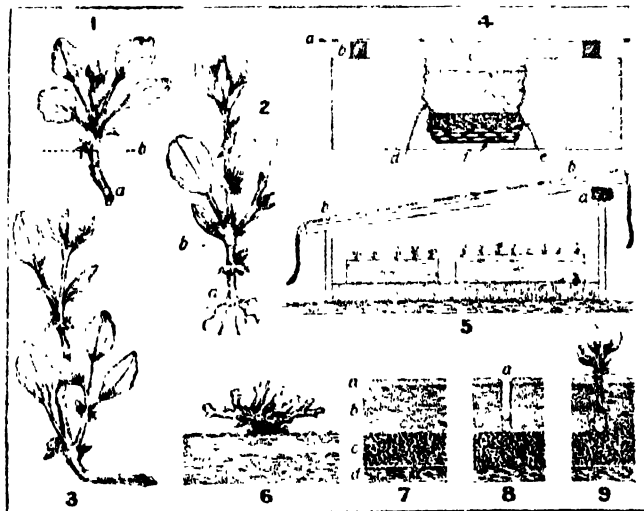
Viola. Tiny yellow flowers of the low growing rockery plant

breeding between *Viola cornuta*, a Pyrenean plant, and the pansy.

They flourish in ordinary well tilled soil, and are propagated by cuttings inserted in sandy soil in a cold frame in September, during the winter in mild weather the frame must be ventilated freely. The plants are set out of doors in April, and will bloom throughout many summer weeks if the dead blooms are picked off and the soil is moist. They are also easily raised from seeds sown under glass in spring. Some of the best varieties are: Primrose Dame, pale yellow; Maggie Mott, lavender; The Swan, white; Moseley Perfection, yellow; W. H. Woodgate, pale blue; Archie Grant, purple-blue; Mrs. Chester, white and purple; Redbraes, yellow; Arkwright's Ruby, red.

Viola cornuta is a plant of tufted growth which bears small flowers in profusion; there are varieties with blooms of purple, rose, and other colours which are most useful for planting in rose beds.

Of the species or wild types suitable for the rock garden the following are very charming flowers: *calcarata*, lavender-blue; *gracilis*,



Viola Culture. 1. Cutting: a, how to prepare; b, depth to plant. 2. Natural plantlet: a, root growth; b, depth to plant. 3. Type of cutting to avoid. 4. Violas from seed: a, glass; b, cross sticks; c, sandy soil; d, compost; e, leaves; f, crocks. 5. Seedlings transferred to shaded cold frame: a, ventilating block; b, shading material. 6. Old plant trimmed to provide cuttings. 7. Soil preparation for cuttings: a, sand; b, fine loam; c, ashes; d, sub-soil. 8. Dibbled hole with sand at base. 9. Cutting suitably planted

purple, and its fine variety Purple Robe and lutea. These should be planted in gritty, loamy soil in slight shade.

VIOLET. This favourite garden flower pays for good cultivation. If the plants are left undisturbed for years the blooms become small. It must be planted in deeply dug soil enriched with manure in a slightly shaded position; a border facing west is ideal. In May the old plants should be lifted and separated into pieces, the best of these being replanted. Single varieties are set at 15 in. apart, double varieties at 12 in. apart. During the summer months the soil between the plants should be hoed frequently to keep down weeds, and all runners must be cut off.

To ensure fine flowers the violet bed ought to be replanted annually, or, at all events, every two years. Some of the best varieties are Princess of Wales, Czar, California, and La France, violet blue; and White Czar, white. These are single flowered. Good double violets are Comte de Brazza, white; de Parme, lavender; Marie Louise, mauve purple; Mrs. Astor, rosy heliotrope; and Neapolitan, lavender. Admiral Avellan, reddish mauve and Coeur d'Alsace, pink, are two pretty single violets of unusual colouring.

To obtain violets in winter some of the plants should be lifted and planted in a bed of soil in a cold frame in September; the frame must be in a sunny position; it should be ventilated freely in mild weather in winter.



Violet, Princess of Wales, a large, long-stemmed bloom

It is an advantage to make up a bed of fresh, dry leaves in the frame beneath the soil in which the violets are. See Dog's Tooth Violet.

VIOLET CRESS. The hardy annual that is called violet cress or *Ionopodium* is of miniature growth, and produces tiny flowers of white tinged with purple. It should be sown in spring where the plants are to bloom in summer, in light soil in partial shade in the rock garden.

VIOLET GROUND BEETLE. This creature is a little friend to the gardener, and therefore should not be destroyed. It is one of a large family of beetles, the parents and larvae of which run about the surface of the soil devouring grubs and other pests. This beetle is about 1 in. long, and may be recognized by its colouring of violet-black.

VIOLETTA. This is a small-flowered viola, of which there are many varieties suitable for the rock garden or the front of the flower border. See Viola.

VIOLIN. To the eye the violin presents three principal parts: the body, which is the resonating chamber; the neck, upon which the finger-board is fixed; and the strings, which extend from one end of the instrument to the other. From a constructional point of view it comprises no fewer than 67 distinct pieces of wood, fitted and glued together, in addition to which there are 13 movable fittings, such as strings, pegs, the bridge, etc.

The violin is an instrument which demands not only absolute perfection of workmanship, but also most careful adherence to those principles of measurement and proportion exemplified in the extant specimens of Stradivari, Amati, Guarneri, and the other masters. It is possible for good workmen to turn out excellent modern violins, but the merit of these is always according to the personal care bestowed upon each instrument, a care which is necessarily lacking in the case of the cheap fiddle produced by the thousand.

Details of the Body. An examination of the body will show that the wood employed is not the same throughout. There is a reason for this. The back and the belly exert a mutual influence, and therefore if the former gives a hard, metallic sound when tested by rapping it with the knuckles it is necessary to counteract this by choosing for the belly a somewhat softer wood.

Besides the density of the wood, there are other factors which enter into calculation. The harder the wood, the thinner it can be worked to promote freedom of vibration, and this thinning of the plates is an important detail of the workmanship. Though other woods, such as sycamore, can be used, maple is preferably chosen for the back, as also sometimes for the neck and ribs. The belly and the inside fittings, such as the bass bar, the blocks, the sound

post, etc., are of pine. The age, density, and grain are all-important considerations in selecting the wood. The finger-board, the tailpiece, and the pegs are of ebony.

The body of the violin consists of the back and the belly, which are united by the ribs, but it would be too frail to withstand the strain of the strings without some internal adjuncts. These are first of all the blocks, four of which are glued in the corners next to the waist of the violin, with two more at the top and bottom respectively; but the most important fitting is the sound-post, which is placed about $\frac{1}{4}$ in. or less behind the right foot of the bridge. This resists the thrust of the bridge upon the belly, and plays an indispensable part in transmitting the vibrations of the strings to the body. Its thickness, density, and exact position are factors which vitally affect the tone.

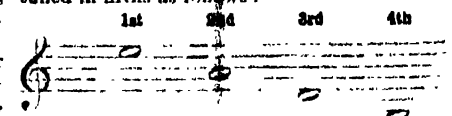
The linings are narrow strips of pine, which run all round the inside edges of both back and belly, affording a wider surface for gluing to the ribs, and thus strengthening the structure. The last inside fitting is the bass bar which is fixed longitudinally to the belly close to the left sound hole. Mention must also be made of the purfling, the thin black lines of stained plane wood which follow the outlines and obviate any possible danger of the edges splitting. Lastly come the *f* or sound holes which are cut in the belly.

Neck and Varnish. The neck is fixed to the upper end of the body, and terminates in the head or scroll. Immediately below the scroll is the peg-box, the sides of which are pierced with holes to receive the four pegs. The slight projection at the back is called the nut. Upon the upper surface of the neck is fixed the fingerboard, which is slightly convex, and projects over the belly to within an inch or so of the top of the *f* holes. The strings extend from pegs, round which their one end is coiled, and pass over the bridge to the tailpiece, in which the other end is fixed. The bottom of the tailpiece has a loop of stout gut, which passes round the tailpin on bottom rib.

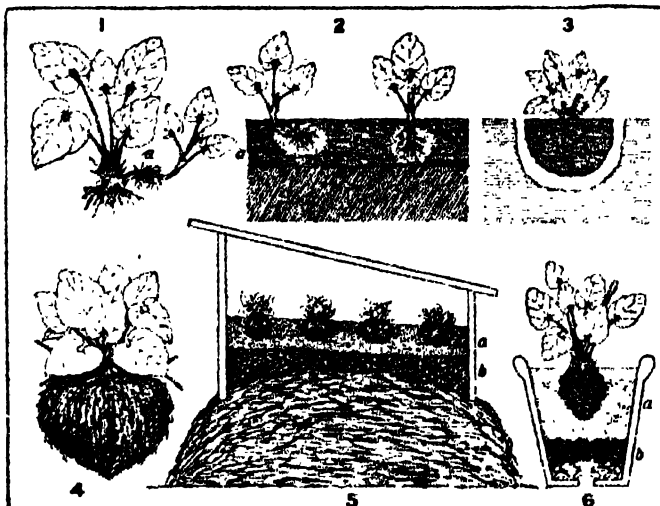
This description of the parts of the instrument may be completed by mentioning the varnish, which is put on after the desired yellow, red, or brown has been applied to the wood in the form of a wash. Spirit varnish is often used for cheap violins. Oil varnish, though slower in drying, is more lasting.

The bridge transmits the vibrations of the strings to the belly, and, speaking generally, a heavily built instrument will take a finer bridge than a lighter one. Its position is of extreme importance. The correct place for its two feet is exactly between the nicks on the inner edges of the *f* holes. The feet must also be adjusted exactly to the curve of the belly. When properly placed, the right foot will be in line with the sound post, and the left foot immediately over the centre of the bass bar.

Tuning the Strings. The four strings are tuned in fifths as follows:



The second string A is the standard by which the others are regulated. As they are all of the same length, the differences in pitch have to be secured by differences in thickness and density, while the fourth string G is wound round with silver wire. The requisite tension is obtained by turning the pegs so as



Violet Culture. 1. Plant with rooted runner (a). 2. Runner planted: a, fine soil with sand around roots. 3. How to lift clumps. 4. Trimming same for frames. 5. Frame culture for winter blooms: a, fine soil; b, leaves. 6. Pot culture: a, fine compost; b, rough soil

to stretch the strings. With experienced performers this is done by the left hand, while the right hand is free to test the pitch with the bow; but beginners hold the instrument by the neck, resting it against the knee, while the pegs are manipulated, the string being twanged from time to time until the pitch is correct. The final test, however, is always made by the bow.

To fix a new string, knot one end, slip it through the proper hole in the tailpiece, and draw it through the slit, where it will be held by the knot. Thread the other end through the small hole in the peg, pass it under itself, and turn the peg, which should be pressed inward as it is turned. The rest of the coil can then be cut off. The G string is sold of the proper length only. The pitch of the A string having been adjusted to the pitch required by circumstances, the D string is tuned with it, and then the G string below that. Finally, the first string is tuned with the second string. In each instance, make sure that the fifth is absolutely perfect before proceeding.

Holding the Instrument. The violin is held with the left hand encircling its neck, but so that the palm does not touch it. The end of the instrument rests on the left collarbone, where it is kept in place by a sufficient pressure from the performer's chin. To induce greater security of tenure, some players use a chin-rest fixed to the violin, or place a pad upon the collarbone; but this latter, at any rate, would seem to militate against resonance.

The neck of the instrument resting in the hollow of the thumb, the fingers are held over the finger board so that the first finger if pressed down will produce F on the first string, the second finger C on the second, the third finger G on the third, and the fourth finger D on the fourth string.

The bow is held in the right hand. The thumb must touch the raised part of the nut, and the fingers must be rounded slightly over the stick. Possibly, with some hands, the little finger will experience difficulty in doing this, but if it can be managed it will be of great advantage in forte playing. The bow crosses the strings at right angles between the bridge and the end of the fingerboard, and to secure an even, steady tone, it should preserve that position in every respect. The action of the right arm should be without stiffness, and special attention should be given to the freedom and independence of the wrist, the forearm, and the upper arm.

The Music. Music for the violin is always written on the treble staff with the G clef. Bowing is always indicated exactly, otherwise each note receives a separate bow. The combination of slur and dot, etc., are too numerous to be treated in detail here, and full information should be sought in violin schools, but the chief thing to be remembered is that all the notes under one slur are to be performed by the same stroke of the bow. A down bow is indicated by = and an up bow by ^.

The only other notation that need be mentioned here is that for harmonics. A small o placed above a note means that it is to be played as a natural harmonic. If artificial harmonics are desired, there is a double notation; the notes which have to be pressed down are given in the usual notation, while for the harmonic there is a diamond shaped note joined to it by the same stem, thus



VIRGINIA CREEPER. The botanical name of this common hardy climbing plant, so often planted against house walls, is *Vitis*

(*ampelopsis*) *quinquefolia*, its large lobed leaves colour brilliantly in autumn. The small leaved *Vitis* *inconstans* (*Ampelopsis* *Veitchii*) is self-clinging, and even more brilliantly tinted. These climbers thrive best on sunny or only slightly shady walls. It is necessary to support the self-clinging kind with a few pea sticks until it has started to cling to the wall. The large-leaved Virginia creeper should be trained to a trellis of wood fixed against the wall. Planting can be done in autumn or spring. Propagation is by



Virginia Creeper. Small leaves of the self-clinging variety known as *Ampelopsis* *Veitchii*, valued by the gardener for its decorative effect and beautiful autumnal colouring.

cuttings placed in a frame in autumn, and by small pieces of growth, each containing a bud, inserted in sandy soil in a heated greenhouse in early spring.

VIRGINIAN COWSLIP. This is the common name of a hardy herbaceous perennial, *Mertensia* *pulmonarioides*. It grows 18 in. high and bears blue flowers in May. It flourishes in ordinary well drained soil, and is increased by division in February.

VIRGINIAN POKEWEE. This vigorous hardy herbaceous perennial is suitable for the wild garden or large border. The stem reaches a height of 6 or more ft., and the small white flowers are followed by deep purplish berries; it is most ornamental in early autumn. Propagation is by seeds sown out of doors in spring. The roots are poisonous.

VIRGINIAN STOCK. This low growing, hardy annual blooms in about 6 weeks after the seeds are sown out of doors in March or April. It is a pretty little plant for an edging to a flower border, the blooms being crimson, rose, or white according to the variety chosen. Its beauty is rather short-lived, but another sowing may be made to provide blooms in late summer. Its botanical name is *Malcolmia* *maritima*.

VIRGIN'S BOWER. This is the common name of a rampant climbing plant, *Clematis* *flammaria*. It bears a profusion of small white fragrant flowers in late summer, and is useful for covering an arbour or trellis. It flourishes in ordinary soil.

VIRUS. Minute infective agent, smaller than bacteria, invisible under an ordinary microscope. Viruses cause foot-and-mouth disease, influenza, common cold, measles,

smallpox, yellow fever, and malaria. They are spread by insects, by contact, and in minute drops of moisture from nose, throat, or mouth (e.g. sneezing, coughing). Some bacteria are attacked. According to type, virus may be sensitive to intense heat or cold, succumb to or resist chemical substances, remain dormant for years in dry matter, requiring most favourable conditions. Plant viruses are usually transmitted by insects, e.g. aphids; by contact between infected plants, or through infected seed.

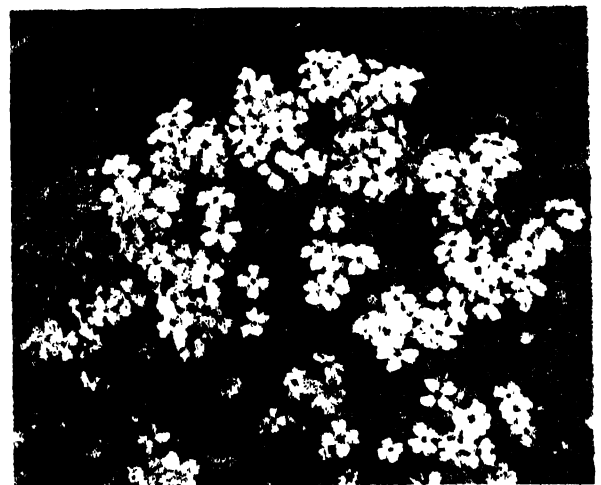
VISCARIA. This is a very showy hardy annual with rose, crimson, white, or purple flowers. It reaches a height of about 12 in. thrives in ordinary soil in a sunny position, and blooms in summer. The seeds sown out of doors in March and April. As with all annuals it is most necessary to thin out the seedlings to give them room for development.

VISITING: The Etiquette. The usual method of keeping up with friends who live at a distance is to stay with them or have them to stay in one's own home. Few visits exceed a fortnight in length, and a week end is the most usual. The invitation naturally depends upon the circumstances both of host and guest, and must be adapted to suit them. People who possess cars often enjoy week ends which might prove too expensive for a guest to whom the railway fare is a consideration.

The hostess will naturally invite people at the time when it is most convenient for her to have them, and if wise will also make the invitation a *debut* to one. She will ask the guest for a week, a week end, a fortnight, or whatever period may be suitable. The guest should seldom stay on after that period.

If asked for a week end, the guest should assume that he is not expected before luncheon on Saturday. He will also assume that his departure early on the Monday is expected. If asked vaguely for a few days, the visit should always stop short of the week.

The time of departure is necessarily varied by circumstances. If the guest is leaving by



Virginian Stock. Dainty flowers of a popular and pretty edging plant suitable for garden borders.

ear, as a rule an hour after breakfast is convenient but if returning to business after a week-end there may be a specially early train to catch which should be understood before or soon after arrival. Other departures may be regulated by convenient trains for cross-country journeys, but in any case it is best to have the matter clearly settled in advance wherever this is possible.

At the conclusion of a visit it is customary for the guest to tip at discretion any servant who has attended him or her. It is a matter of courtesy for the guest to send a letter of thanks and appreciation to his or her host or hostess.

VITAMINS. Complex organic substances which exercise a profound influence on the metabolism of the body and are necessary to the health and nutrition of human and other animal species. Vitamins originate in plant life and are present in the flesh tissues of animals that live on plants, hence vitamins occur in varying proportions in both animal and vegetable foods. Vitamins are classified by letters of the alphabet and by subscripts of certain letters, and their classification and nutritional and medicinal functions are as follows:

Vitamin A. This is found in animal fats, such as butter, cream, egg yolk, and cod liver oil. Margarine, unless artificially fortified with it, does not supply vitamin A, nor does lard or bacon fat, unless the pig is fed on green foods. Food deficient in vitamin A causes children to lose weight, and induces degenerative changes in the epithelial cells lining the mucous membrane of the body, so creating susceptibility to infection by micro-organisms. The human liver has a certain reserve of vitamin A but this reserve is always deficient in persons suffering from septicaemia and respiratory and kidney diseases.

Vitamins B and B₂ include a number of related but functionally dissimilar vitamins. Deficiency of vitamin B in the diet is the cause of beriberi. Vitamin B occurs in the outer parts and germs of cereals, but is removed when grain undergoes the usual commercial processes. Potato, meat, and milk contain some vitamin B, and these foods serve to protect people from the worst effects of its absence in processed grains.

Vitamin B₂ is a group designation which includes vitamins containing one or other, and sometimes all, the three substances nicotinic acid, riboflavin, and aderinin. Deficiency of nicotinic acid affects the nervous system and the skin, stomach, and intestines,

and is one of the causes of pellagra. Lack of riboflavin causes eye inflammations, acne, and skin troubles such as cracked lips. Aderinin deficiency may induce skin and scalp diseases such as acne and seborrhoea.

Vitamin C is essential to rendering the body resistant to scurvy and anaemia; deficiency in vitamin C lowers resistance to infection and prolongs the healing of wounds.

Vitamin D. Deficiency of this vitamin is a cause of rickets, lupus, chilblains, and rheumatoid arthritis. A diet rich in vitamin D is essential during pregnancy and for nursing mothers.

Vitamin E. A diet rich in this vitamin gives relief to some nerve and muscular conditions, and is important in the relief of heart troubles.

Vitamin K is essential to the clotting of the blood, and a diet containing it benefits sufferers from nettle-rash and chilblains.

Vitamin P is generally associated with vitamin C and has similar effects.

Although deficiency diseases are rare in

VITAMIN VALUES OF COMMON FOODS

VITAMIN A				VITAMIN C			
Carrots	100	100	100	Rose hips	100	100	100
Liver fish and cod	100	100	100	Black currant	100	100	100
Fish liver	100	100	100	Broad beans	100	100	100
Egg yolk	100	100	100	Peach	100	100	100
Butter	100	100	100	Orange juice	100	100	100
Let us vegetable	100	100	100	Strawberry	100	100	100
Carrots and turnips	100	100	100	Asparagus	100	100	100
Dried apricots	100	100	100	Spinach	100	100	100
Milk (condensed)	100	100	100	Cauliflower	100	100	100
Milk (sterilized)	100	100	100	Cabbage	100	100	100
Cheese	100	100	100	Watercress	100	100	100
Egg yolk	100	100	100	Liver	100	100	100
Whole milk	100	100	100	New potatoes	100	100	100
				Green peas	100	100	100
VITAMIN B, B ₂				VITAMIN D			
Yeast (brewer's)	100	100	100	Red currant	100	100	100
Shrimps	100	100	100	Rhubarb	100	100	100
Dried peas	100	100	100	Grapefruit	100	100	100
Butter	100	100	100	Gooseberry	100	100	100
Wheat flour	100	100	100	Loganberry	100	100	100
Rice	100	100	100	Sweet	100	100	100
Oatmeal	100	100	100	Beet	100	100	100
Rice	100	100	100	Letting	100	100	100
Pork (lean)	100	100	100	Raspberries	100	100	100
Liver (kidney)	100	100	100	Tomato	100	100	100
Egg yolk	100	100	100	Milk	100	100	100
Hard-boiled	100	100	100	Beet	100	100	100
Egg	100	100	100	Parsnip	100	100	100
Vegetable	100	100	100	Carrot	100	100	100
Lean meat	100	100	100	Onion	100	100	100
Soft-boiled	100	100	100	Apple	100	100	100
				Banana	100	100	100
VITAMIN B ₂				VITAMIN E			
Yeast (brewer's)	100	100	100	Wheat	100	100	100
Yeast extract	100	100	100	Cereals	100	100	100
Liver	100	100	100	Green leaves	100	100	100
Kidney and heart	100	100	100	Vegetables	100	100	100
Meat, lean	100	100	100				
Fish	100	100	100	VITAMIN K			
Wheat meal	100	100	100	Liver	100	100	100
Egg	100	100	100	Green leaves	100	100	100
Milk	100	100	100	Animal fat	100	100	100
Rice	100	100	100	VITAMIN P			
Oatmeal	100	100	100	Oranges	100	100	100
Potato	100	100	100	Lemons	100	100	100
Spinach	100	100	100	Prunes	100	100	100
Other vegetables	100	100	100	Grapes	100	100	100

This table shows the vitamins present in various foods. The comparative content of any one vitamin for specific foods is indicated by one or more stars, one star representing unity. Thus in the vitamin A foods, cod-liver oil contains twice the vitamin A value of green vegetables, and four times the vitamin A value of animal and fish meat.

Great Britain, there is evidence that many children suffer in health from an habitual slight shortage of vitamins, especially of the B vitamin complex and A and D.

Children require more vitamins A and D than adults do, and they commonly get too little good animal fat. Milk is an unreliable source of the fat soluble vitamins and should not be depended on to protect from rickets. See Diet.

VOICE: Its Care. The voice is the sound that is produced by the vibration of the vocal cords of the larynx. These are set in motion by waves of air breathed out from the lungs. The pitch of the vocal sounds depends on the rate of vibration. Sounds produced in the larynx are modified by the movements of the lips, tongue, etc. The quality or timbre of the voice depends upon secondary vibrations, overtones or harmonics, superimposed on the primary vibrations. The loudness depends chiefly on the quantity of air which is employed in order to set the vocal cords vibrating.

Men have deeper or lower pitched voices than women because, as a rule, they have longer vocal cords. The breaking of the voice, which occurs at the change from childhood to adult life in the male, is due to the rapid growth of the larynx at this time, and the temporary lessening of control over the muscles which govern the tension and rigidity of the larynx.

Loss of voice and gruffness of the voice or hoarseness may be brought about by anything which interferes with normal movements of the vocal cords. Paralysis of the nerves supplying the cords, growth on the cords, ulceration, catarrhal inflammation, etc., all may interfere to a greater or less extent with the production of or with the quality of the voice. See Laryngitis, Larynx, Throat, Tonsillitis.

VOILE. These are both silk and wool voiles, but these are unimportant in comparison with the cotton voiles. All are light in weight and open in texture.

Crispness is a virtue in cotton voiles, plain or knobby, double voiles, as they are sometimes called, crease less easily than the soft, clinging kinds, last longer, and require washing less frequently. Especially when buying all coloured voiles, care should be taken to choose the harder feeling variety. Patterned or plain coloured cotton voiles make excellent glass curtains for bedroom windows.

VOL-AU-VENT. This refers to a round or oval case of puff pastry which, after baking, is filled with some delicate ragout of chicken, sweetbread, lobster or other fish. Sometimes quenelles of chicken are mixed with the sweet bread. The sauce used is always rich and usually flavoured with mushrooms and truffles. When served as a sweet, the pastry case is filled with fruit.

To make a good vol-au-vent 1 lb. puff paste will be required. After giving the paste six turns, roll it out 4 in. thick and cut it to an oval shape. Place the case on a baking-sheet rinsed with hot water and brush the top of it with egg, then mark it with a cutter or sharp knife within about 1 in. of the edge all round to form the lid. Put a hoop of white paper 2 3 in. high and a little larger than the case around it. Bake it in a hot oven from 1/2 to 1 hour.

When baked, remove the lid, scoop out any soft pieces of pastry, brush the inside of the case with egg, take away the paper and return the pastry to the oven for a few minutes. Have the filling ready and well heated, then fill the case and cover with the lid. It is better to dish the vol-au-vent before filling it.

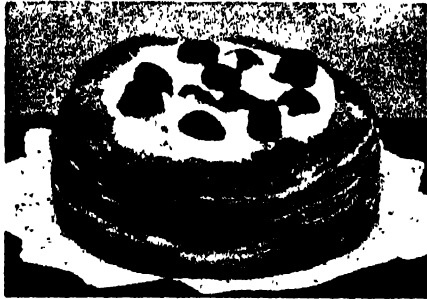
Turbot Vol-au-vent. A vol-au-vent case filled with cold boiled turbot reheated in some white sauce makes a good luncheon dish. Prepare the pastry case as directed, break the fish into flakes, rid it of skin and bone, and then moisten it with the sauce, made from fish stock. Add a few shelled shrimps and seasoning to taste, heat the mixture thoroughly, and then turn it into prepared case. Serve very hot.

Turkey Vol-au-vent. Small vol-au-vent cases can be filled with a savoury mixture of turkey and ham. While the cases are baking, mince the remains of some cold cooked turkey, add to it about a quarter of its weight of grated ham, a little white sauce and a spoonful of thick cream. Heat these together in a small

pan, season them to taste with salt, pepper, and mace, and then turn them into the hot cases. Serve them at once.

Fruit Vol-au-vent. A good sweet is made by putting 3 dessertspoonfuls Demerara sugar into a saucepan containing $\frac{1}{2}$ gill water and allowing the two to boil for 5 min. or until a thick syrup is formed. Add 1 lb damsons, cherries, plums or other suitable fruit, cook them very gently until they are tender and then leave them to get cold.

Make the vol-au-vent case, as previously directed, take out the inner circle of pastry



Fruit Vol-au-Vent an attractive sweet

and when the case is cold fill it up with the fruit, keeping back some of the juice if too moist.

Mix a few drops of vanilla and a sprinkling of castor sugar. On 1 gill of cream, whisk the whole until it thickens, and then shake it on to the fruit, decorating the top with one or two damsons, cherries, or neat pieces of fruit if a larger kind is used. If liked, a teaspoonful of lemon juice can be added to the flour when it is mixed with water; this counteracts the richness of the pastry. See Pastry Sauce.

VOLT. In electricity the unit of electromotive force or electrical pressure is termed a volt. It is that pressure which will drive a current of one ampere through a resistance of one ohm. See Electric Light.

Voltage. See Electricity.

VOLTMETER: Its Uses. The instrument known as a voltmeter is used for recording the voltage or pressure of an electric current flowing in a circuit. The watch pattern voltmeter is convenient for testing the voltages of accumulators or other sources of small voltage supply. It consists of a metallic casing enclosing the coils, etc., and fitted at its bottom end with a pointed lug which forms one of the connexions. The other connexion is a short length of flexible wire which passes through a hole in the knob to which the ring is fitted. The outside end of the wire is finished off in a sharp-pointed metal rod.

To use the instrument it should be inspected to see if it requires connecting to a circuit a definite way round. If this is the case, a plus sign is usually to be found near its appropriate terminal. This terminal should be placed on the positive side of the battery or circuit under test, while the negative side of the battery is joined to the negative side of the instrument. To obtain an accurate reading the voltmeter should be held vertically. Good connexion is made by scraping and pressing the pointed ends of the voltmeter connexions while a reading is being made.

As the voltmeter is required to read the difference of potential between two points in a circuit, it is placed in parallel to the circuit containing the resistance causing the potential drop. In this respect it differs from an ammeter, which is a low-resistance instrument, and, as it measures the total current flow it is wired in series to the circuit.

Testing H.T. Batteries. Only high resistance instruments should be used for testing the voltages of high-tension batteries, otherwise an unfair load is placed upon the small cells.

In order to obtain an accurate indication of the state of a battery used for a wireless set all voltage readings should be taken with the battery delivering its normal current to the valves. "Open circuit" readings are misleading because the cells tend to recover after a period of rest, but when current is consumed the voltage gradually falls to a steady value depending upon the condition of the battery.

The ordinary high-resistance voltmeter is not suitable for measuring the output voltages of mains H.T. units.

See Accumulator Battery.

VOLUME CONTROL: In Wireless. The most efficient form of volume control is obtained with the use of one or more "variable mu" valves (q.v.). These are valves in the high frequency amplifying circuits of a set whose amplifying properties can be varied by varying their grid biases. Thus the sensitivity of the receiver is altered as with the different levels of volume required. There is no danger, with this method, of overloading occurring in any of the subsequent amplifying valves up to the maximum output for which the receiver is designed, even in the case of the very powerful stations. The grid bias adjustments are usually effected by means of potentiometers.

Automatic Volume Control. An extension of the "variable mu" principle. Energy from the detector valve is fed back, rectified and smoothed, to the grids of the variable mu valves so that if the general level of the input to the detector valve rises, the sensitivity of the set is reduced and a substantially constant volume level preserved. In this manner the fading effects in the reception of distant broadcasting stations can be countered. See Potential Divider.

VOLUNTEER SNOOKER. This billiard game is a variant of snooker. It can be played by two or more persons either as sides or independently. It is called volunteer snooker because a player is said to volunteer if, when striking, the cue ball hits a pool ball which he is not on, after the first score.

In general the game proceeds in almost the same way as snooker pool. The same 22 balls are necessary and there are no cannons. The balls are the white one, known as the cue ball, with which each striker plays, 15 red balls, and one each of the following colours: yellow, green, brown, blue, pink, and black. These six are the pool balls. See Billiards; Snooker Pool, etc.

VOMITING. The forcible expulsion of the contents of the stomach through the mouth. Vomiting is generally preceded by nausea and with this a free flow of saliva. The first thought on the occurrence of vomiting will generally be that it is due to some disturbance of the stomach itself caused by the ingestion of unsuitable food or of some irritant poison, but there is a very long list of possible causes, many of which have no connexion whatever with the digestive apparatus. Those that have such a connexion, apart from gastric affections themselves, include irritation in the pharynx, irritation or obstruction of the intestine, appendicitis, gall-stone, and other affections of the liver and gall-bladder.

On the other hand, vomiting may occur in the eye disorder known as glaucoma, and in some ear disorders in which there is disturbance of the apparatus concerned with preserving balance; it is a common incident in pregnancy; it usually occurs when there is renal colic; it may be an early symptom of meningitis, and is caused by tumours in the brain.

Information regarding the cause of vomiting may often be derived from an examination of the vomitus, or vomited matter. Frequently this will consist of undigested food simply, but when vomiting is caused by corrosive poisons, the vomitus may contain shreds of stomach-lining and blood. In gastric ulcer and

cancer there is also blood, but there are other causes for blood vomiting. Bile is often found in the vomit, and sometimes wrongly supposed to be the cause of the vomiting, when what has happened is that bile has been forced into the stomach by the muscular contractions that cause vomiting.

The treatment of vomiting depends on the cause, and in many of the conditions above mentioned treatment will have to be directed to other things than the vomiting which is merely incidental and relatively unimportant. When the cause is irritating food or something of the kind, it is desirable to give large draughts of tepid water. This washes the stomach out, and makes the act of vomiting less distressing. Sips of hot water may check vomiting, though sometimes sips of acid soda water are more successful. In persistent vomiting during fevers, sips of acid champagne often prove beneficial when other remedies have failed. Counter-irritation over the pit of the stomach by applying a mustard plaster is another useful measure in some instances.

Many drugs, including bismuth, morphine, dilute hydrocyanic acid, and others are used in treatment. A convenient remedy may be found in a single drop of tincture of iodine in a tablespoonful of water, the dose to be repeated every 15 minutes for five or six doses. See Bihousness; Emetic; Gastritis; Indigestion; Morning Sickness; Nausea; Poisoning; Sea Sickness.

VOTE. Qualifications for parliamentary and local government votes are specified by the Representation of the People's Acts, particularly of 1918 and 1949. The vote can be exercised by virtually all men and women over 21 years of age, provided they are British subjects. Such persons must have resided for three months at the house in the constituency in which they vote.

The university franchise and university constituencies, together with the right to vote in virtue of business premises in a constituency other than that in which the voter lives, were abolished by the Act of 1948, which established the principle of one elector one vote and ended plural voting.

Special arrangements are made regarding the rights of soldiers, sailors and airmen to vote. They are registered in the constituencies for which they would be qualified if they were not away on service. This condition applies not only to soldiers and sailors on full pay, but to merchant seamen, pilots and fishermen, and to those engaged on R. d. Cross and other work of national importance abroad. These persons are allowed to vote by proxy. The Act of 1918 allows persons in receipt of poor relief to vote, previously they had been disqualified.

The Register of Voters. To exercise the right to vote the person's name must appear on the register of electors. This is compiled and published every year.

The town clerk or clerk to the county council acts as local registration officer and decides whether or not a person is qualified to have his or her name on the voters' register. Every household should receive once a year from his or her local registration officer a form on which must be entered the names of all persons over 21 residing with him or her. The completed form must be returned to the registration officer within its specified period. Anyone dissatisfied with the registration officer's decision can take the case to a county court and from there to a court of appeal. A person desirous of obtaining a vote should therefore first find out whether the name is on the register, and if not should claim a vote before Aug. 7.

Voting for Local Authorities. As regards local authorities, persons, both men and women are qualified to vote at elections for these bodies if they are 21 years of age and over,

and occupy, either as owner or as tenant, any land or premises in a local government electoral area. He or she must have occupied the premises for the qualifying period of three months, and the name must appear on the roll of electors. In this sense a tenant includes a lodger, provided he or she is in the occupation of unfurnished rooms.

VULCANITE. The real difference between vulcanite and ebonite consists in the quantity of sulphur used in the manufacture. Vulcanite is made by incorporating india-rubber or gutta-percha with ordinary sulphur and lamp black in a masticating machine. It is pressed into moulds and heated in a steam oven at a temperature of 315° F. In use and methods of working vulcanite and ebonite are practically identical. See Ebonite, Polishing.

WADDING. Cotton wadding, which may be bought cheaply at any draper's, is used for padding such articles as coats, and also as an interlining for quilting. A layer of wadding, cut to the same dimensions, is laid between the outer fabric and the lining, and the three are quilted together. A special attachment for quilting is sold by sewing machine makers.

Common wadding is usually of a brownish colour. Surgical wadding or cotton should always be employed for wounds or for direct application to the skin, as in making pneumonia jackets. In re-covering chairs it is often advisable to lay a sheet of common wadding under the embroidery canvas, cloth, or leather. See Upholstery.

WAFER. A wafer usually takes the form of an imitation seal. It is made of glazed paper, gummed at the back, and is affixed to the flap of the envelope in the same way as a seal. At one time they were very popular, and were used by many people, but of recent years they only appear in many colours and designs at Christmas time to decorate letters and parcels or gifts. Occasionally wafers are printed for some charitable purpose, and people buy them and use them on their letters as a means of inducing others to subscribe to the charity.

WAFER BISCUIT. Home-made wafers may be composed of equal quantities of sugar and flour moistened with 1 tablespoonful cream and a quarter that quantity of orange-flower water to each oz. of flour. The mixture is beaten for $\frac{1}{2}$ of an hour and then baked in portions between the wafer irons, somewhat on the same principle as waffles.

An easier and more modern recipe is to beat 1 oz. butter with the white of an egg till mixed, then to add them to 1 lb. flour, together with sufficient cream to form all into a thick paste. It is important to knead the mixture till it is as fine and smooth as glass, roll out into very thin pieces, shape and bake 3 min. in a quick oven. Before rolling, let the paste stand 20 min.

WAFFLE. This American dish has enjoyed fluctuating popularity in England. It is composed of a thin, rich batter mixture cooked at high temperature in a waffle iron until crisp and brown. A little practice is necessary to achieve the desired degree of crispness, and the amount of batter required for each waffle. The thickness of the batter may vary according to personal taste, a thicker batter requiring a little longer in cooking to crisp it. Plain waffles are served with maple syrup, golden syrup or honey as a rule, or with just a pat of butter on the top.

A good foundation recipe is as follows: 1 heaped breakfastcupful flour, 2 egg yolks and 3 egg whites, 1 teaspoonful salt, 1 teaspoonful sugar, 1 breakfastcupful milk, 2 tablespoonfuls melted butter. Sieve the flour, salt and sugar together, and milk and egg yolks beaten until light, and the melted butter. Beat well, and when smooth add the egg whites beaten stiffly. The batter is lighter if allowed to stand a little time.

But the waffle iron, sprinkled with a teaspoonful of water, and when the iron stops steaming put in about a quarter of the waffle mixture. This quantity may vary a little with different irons and only experiment will show the right quantity to use. If too much batter is inserted it will ooze out when the iron is closed; if too little, it will not spread evenly and the thin places will burn. Generally the squares in the iron should be two-thirds full.

Close the iron, and cook until no steam is seen coming from between the two halves. If the waffle is hot, crisp and brown by this time, lower the heat and cook for a minute or so longer, but be careful that it does not burn. Cooking takes 2 to 3 minutes as a rule.

Cheaper waffles may be made by using 1 egg and 2 teaspoonfuls baking powder to the above quantities, while they can be varied by sprinkling the top of the batter when in the iron with chopped cooked sausage or bacon, cooked chicken or grated cheese.

Waffle Iron. This utensil for cooking waffles can be heated by electricity, gas or fire. The electric ones are the most convenient, requiring no turning in the cooking of the waffles, and many of them have gauges which show when they are heated to the right degree. They are often made in aluminium or on bright metal stands for table use.

A new waffle iron needs burning in for 10 minutes before use. Then with a soft cloth dipped in melted fat the iron plate into which the batter is poured should be coated thinly with the fat, the iron closed and the heating continued for 3 minutes. It is now ready for use and grease should not again be applied, the surface merely requiring a sprinkle of water.

WAGES. Money paid for the services of persons in one's employ is known as wages. In the domestic sphere wages are paid to all indoor and outdoor servants, although in the case of governesses and others of superior status the payment is known as salary. Wages are paid either weekly or monthly. There is no rule on the subject, but in general it may be said that indoor servants are paid by the month and outdoor ones by the week. On the other hand, daily maids are as a general rule paid by the week.

Under English and Scottish law employers have certain legal obligations to those to whom they pay wages. The latter must be insured under the national health insurance and contributory pensions schemes while in the employ of their master. Wages that are not paid when

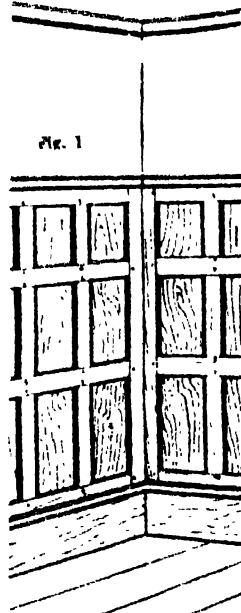


Fig. 1

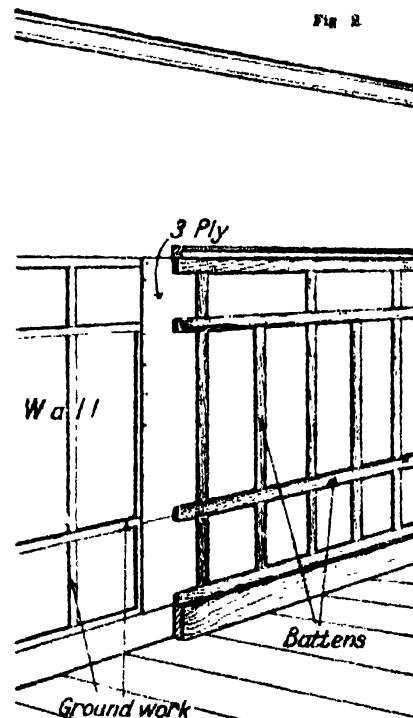


Fig. 2

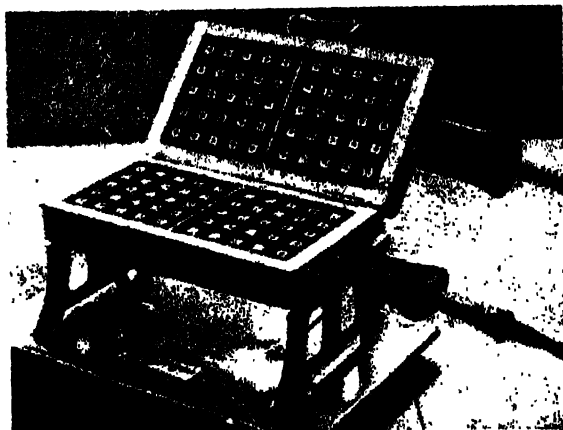
Wainscot. Fig. 1 Typical oak wainscot. Fig. 2 Showing how a simple wainscot can be made up from three-ply and battens.

due can be recovered by an action in a court of law, and in the case of an employer going bankrupt unpaid wages must be paid in full before anything is available for the ordinary creditors. See Employers' Liability; Insurance; Servant.

WAHLENBERGIA. The most beautiful of all the tufted harebells is a little rock garden plant named *Wahlenbergia serpyllifolia*. It grows only a few inches high and bears large purple blossoms of bellflower shape. It must be planted in gritty soil in slight shade. Pumila has lilac-blue flowers; *Hederacea* is of creeping growth and bears pale blue flowers. The best method of propagation is by sowing seeds in a pot of fine soil in a frame.

WAINSCOT. The form of wall covering applied to the interior of rooms and known as wainscot or wainscoting is sometimes composed of marble or other materials, but is usually of wood. It takes the form of panelling at the height of about 5 ft. from the floor to the top.

In construction, wainscot consists of a series of rails and uprights varying from 1 in. to 2 in. thick, tenoned into each other, the interspaces being filled with panels from $\frac{1}{2}$ in. to 1 in. thick. The edges of the rails and uprights are moulded or bevelled; the corners are mitred, and are also grooved to take the panels. Wainscots are generally surmounted by a



Waffle Iron. An electric waffle iron suitable for table use.

capping moulding and finally finished at the bottom with a skirting board.

In oak wainscot it is a common practice to peg the tenons, no glue being applied to the joints. This was the customary method in early oak wainscoting, in which the lower edges of the rails were left square, the top edges bevelled, and both edges of the uprights moulded. Fig. 1 shows a typical example of a wainscot of oak. Where a very large room is to be fitted, it is made up in sections and the parts secured in position separately.

A cheaper form of wainscot may be made by securing sheets of 3-ply to a rough groundwork nailed or plugged to the wall, and then nailing a series of battens to the surface to give the effect of panelling. It is essential to arrange the joints in the 3-ply so that they come opposite the battens, and are thus hidden. The groundwork also should be arranged in a similar formation to that of the battens, so that there is a solid ground to nail to. Fig. 2 shows the finished wainscot of this type and the under-ground. An effective finish to the work can be obtained by staining the battens a darker colour than the 3-ply.

The term wainscot is also applied to oak boards cut in such a way that the silver grain or medullary rays appear on the surface. To secure this effect it is necessary to cut them radially from the centre. See Panelling.

WAITER. This word is occasionally used for a piece of furniture that serves to hold something needful for the table at meal times. Such pieces are usually known as dumb waiters. The word is also applied to a small tray, or salver.

WAKE ROBIN. This name is sometimes applied to the cuckoo pint, otherwise lords and ladies, of English hedgerows. The botanical name is *Arum maculatum*.

WALDSTEINIA. This is the name given to a small family of hardy herbaceous perennial plants, known as the barren strawberry. They rarely attain to a height of more than 6 in., with yellow flowers in late spring and early summer. They are propagated by seeds sown at the same period of the year or by division of the plants in autumn or winter. Waldsteinias flourish in ordinary soil. The most noteworthy kind is *W. fragarioides*; it is useful for planting on a dry bank.

WALK : In the Garden. For convenience of access to various parts of a garden and to facilitate the work of maintenance it is necessary to have a number of paths. Those of gravel should be not less than 5 ft. wide to allow of two persons walking abreast in comfort. Paved paths, which are more expensive to construct, are usually laid only in certain parts, as in the roserie, the little formal garden or the rock garden; a width of 3 ft. is sufficient for these. A wide grass path between borders of hardy flowers is very attractive if kept trim. In making a gravel path the soil should be removed to a depth of at least 18 in. and carefully sifted for stones and other refuse. This refuse together with bricks, broken flower-pots and other drainage material should be placed at the bottom of the walk trench, which should then be filled up with coarse gravel and further surfaced with a layer of fine gravel and sand. The whole should be rolled, leaving the centre higher than the sides. Stone or brick paths must be laid on a foundation of sifted soil, sifted ashes, or sand. See Crazy Paving; Path.

WALKING STICK. Sticks have long been used as aids to walking and as a means of defence in case of attack by dogs or men. They are carried, however, by many men merely as an addition to an outdoor outfit, and a present to a man often takes the form of one of these sticks.

There is hardly any limit to the variety in which walking sticks are made. Many woods are used for them, cherry wood and malacca cane being among the most popular, and they can be bought at prices ranging from a few pence to several pounds. The price depends to some extent upon the material, but more upon the mounting, which may be of silver or even of gold. Initials are sometimes engraved on a band of the metal, this being especially the case with presentation sticks.

As regards shape, sticks may be divided into those with crook handles and those that have no handle but only a finished top. The former are perhaps more useful, and a good example is of a crook ebony with silver mountings at the base of the crook and at the collar. The best are fitted with a horn ferrule. Of sticks without handles, a good example is

of ebony fitted with a gold cap. Others are of malacca cane with a silver cap.

A development of the walking stick is the shooting stick, specially designed for sporting men and women, its special feature being the addition of a seat. The stick itself has a sharp spike at the bottom so that it can be inserted into the ground, and the seat is made by opening out the handle or head. These sticks are sold in various qualities and designs. The seat may be of mahogany, walnut, or some other wood. The better examples have fittings of aluminium, and the seat is covered with leather.

WALKING TOUR. Persons who spend a holiday, either long or short, in walking from place to place need to observe a few simple precautions if the tour is to be a pleasant one. Firstly, there is the choice of footwear. Since everything depends on comfortable feet, this deserves a little care. Stockings or socks should be made of wool as this is less liable to cause chafing or blisters. Men usually prefer thick ribbed golf stockings.

Boots and Shoes. The boots or shoes should fit well, especially at the heels, but should not be new. If they have been in wear for a few weeks they will have taken the shape of the wearer's foot and cause no discomfort. Square heels are essential. The heels should be inspected beforehand and, if necessary, levelled.

People with tender feet are advised to rub them over with a little methylated spirit before starting, and to put a little boracic or other foot powder in their stockings. Some people recommend soaping the inside of the feet of the stockings with a slightly moistened cake of soap. As far as the other clothing is concerned, so long as it is comfortable all requirements are fulfilled, but the wise traveller carries a raincoat or some sort of light coat to put on if the weather changes or during the pauses for lunch, etc.

In arranging a tour, it is wisest to take easy days at the beginning, unless the walkers are in the pink of condition, and to work up for the longer tramps towards the middle of the week, or whatever the period is. It is also wise, when planning the day's distance, to arrange for a shorter distance the day after an extra long one. Fatigue is often felt more the day after than on the day itself.

Accommodation. The securing of accommodation for the night is an important matter. In the more populous parts of the country, where the villages are not very far apart, it is generally possible for travellers to secure sleeping quarters in an inn or, if that is full, in a cottage near. Many walkers, however, like to walk over more lonely districts, such as Dartmoor, the Yorkshire moors, the Cheviot Hills or the Black Mountains, where houses are few and often at considerable distances from each other. Such persons should arrange the day's walking so that a village or an inn can be reached before the close of the day. The arrival should not be too late in the evening, so that, if the inn or cottage is full, there is still time and energy to walk a mile or two to another haven.

The Youth Hostels Association provides simple accommodation for walkers. Hostels are maintained throughout the U.K., each under the control of a warden. Accommodation includes separate dormitories for men and for women, with bed, pillow, and blankets, washing and cooking facilities, and a common-room. Use of these hostels is restricted to members of the association, which charges an annual subscription according to age.

Maps. The walker will find a good map essential. The best are those based on the maps issued by the Ordnance Survey, and the one inch to a mile will, for the majority, be found the most convenient, although the

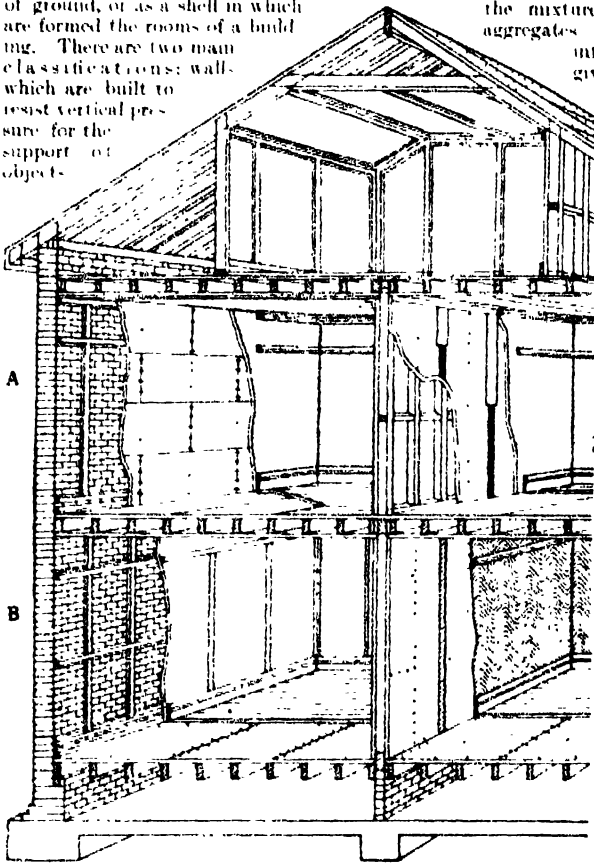


Walk. A richly flowering herbaceous border enhances the beauty of this grass walk, from which, by means of picturesquely curved steps, one descends to a quaint brick path set between grass borders.

two-inch can also be recommended. They can be bought through a stationer. See Holiday.

WALL: In Brick, Concrete or Stone.

A wall is a structure of brick, stone, or other material, generally built for enclosing a piece of ground, or as a shell in which are formed the rooms of a building. There are two main classifications: walls which are built to resist vertical pressure for the support of objects.



Wall Board. Fig. 1 Sectional diagram illustrating various methods of utilizing wallboard for attic lining, interior walls, etc. Wall board can also be used as a roof sheathing, and laid under floor boards as an insulator. See enlarged details of A, B, C, D in Fig. 2.

placed upon them, such as floors, and those built to withstand oblique thrusts, such as that of a vaulting or raftered roof trusses. Another kind of wall for the latter purpose is the retaining wall for earth.

Walls may be hollow or solid, according to the purpose for which they are required. Brick is the material mostly used in their construction except in districts where stone is available. Concrete, too, is much employed. For light partitions and as walls for small buildings, wood is extensively used, the wooden walls being set on concrete or brick foundations.

The thickness of brick, stone, or concrete walls varies according to the weight or pressure they will be called upon to withstand. For walls not more than 5 ft. high, which are to enclose areas, and will only have to withstand wind pressure, an ordinary 9 in. brick wall should be strong enough; lower walls, not called upon to withstand much weight, could sometimes be 4½ in. wide, or the width of a single brick. Concrete for this purpose consists of blocks about 18 in. long, 9 in. wide, and 2½ in. thick.

Internal walls may be made up of timber studding and with wall board. They are dealt with under the heading Partition.

Rougher kinds of walls, suitable for boundaries, are usually made of random rubble stone. Sometimes a walling material for a small building is simply rammed earth, the method being known as *pisé de terre*. In addition, many other materials are employed

in particular districts. Devonshire cob houses and the stone buildings of Gloucestershire and the northern counties are examples. A variety of materials have been experimented with as suitable for walling purposes, notably the mixtures of cement and different aggregates. In this Encyclopedia detailed information about walling is given under the headings of the

materials more commonly employed, e.g. Brick, Concrete, Stone.

It is often necessary to protect the surface of a wall so that the porous bricks do not allow water to pass through to the interior or upward. The latter is dealt with in the case of buildings for habitation by means of the damp course (q.v.), while the exterior surface may be covered with a rendering of cement. The inner surface of walls for buildings, if for habitation, are in almost all cases given a coat of plaster. See Building; Cement Rendering; Wall Board.

WALLABY. A cheap fur, wallaby is obtained from the smaller kangaroos. The hair is soft, rather long, and of a greyish colour, but it is usually dyed, being then sold as an imitation of skunk.

WALL BOARD.

Large flat sheeting composed of fibrous or other material known as wall board is employed in the construction or decoration of walls and partitions. For internal work many different

materials are used, including highly compressed paper, wood pulp or fibre rolled into sheets, plywood, reed and plaster slabs, asbestos cement. Asbestos cement composition is largely used for exteriors and also for internal panelling and partitions. For external walls the material may be purchased with a rough-cast surface on its outer side.

A common size is 8 ft. by 3 or 4 ft. in width. Larger sizes run up to 12 ft. by 4 ft. Thickness is from ½ in. to 1 in. As the weight is from 8 oz. to 1 lb. per sq. ft., wall board is a good substitute for wood and plaster ceilings, which average about twice the weight of a good quality wall board. Many varieties are supplied with a finished surface to take a coating of enamel or paint.

For both internal and external walls in bungalows, garages, or other buildings wall board is much used, owing to its panelled appearance and the rapidity with which it can be put up. The drying-off stages of plaster are obviated and an advantage is that the building is fit for habitation immediately upon completion.

A useful property of many of the wall boards is that of insulating against heat or cold. Some are made of sound-deadening material. The diagrams in Figs. 1 and 2 illustrate various suggested uses of wall board.

In new buildings the wall board is attached directly to the studding or joists of the framework. Short lengths of 2 m. by 2 m. timber are first nailed to the studding and form a means of attachment of the top and bottom ends of the panel. The usual method of fixing wall boards is to nail them in position, using 1 in. or 1½ in. nails spaced about 6 in. apart and ¾ in. from the edge of the panel. The panel is nailed to intermediate joists and studding, the nail space in this case being about 12 in. The nail heads are afterwards covered with plaster-of-Paris stopping, and coated with shellac to prevent the absorption of paint, thus rendering the detection of the nail more difficult.

If the positions of the studding do not conveniently work out to suit the edges of the panels, turning strips or rough grounds must first be nailed in position. This point should be determined before purchasing the material. For studding centred at 16 in. a wall board of 48 in. in width is suitable, while the same width is also used for studding arranged 12 in. apart. For 18 in. studding a panel of 36 in. should be used. A small space of about ¼ in. to ½ in. should be left between adjacent sides and ends of the panels to obviate buckling if the panels expand slightly.

The same applies at the ceiling and floor terminations of the panels. If the panel is a few inches shorter than the required height from ceiling to floor, the gap may be covered by a deeper skirting board. The latter should overlap by at least 1 in.

In fixing panels to vertical walls nailing should be commenced at the top and continued towards the bottom. In the case of a ceiling the centre should be nailed first and then progressively continued to the outsides. In the latter operation an improved T square will be found a useful supporting the panel to the ceiling during its erection. The long side of the square should be about the height of the room with the shorter side less than the width of the panel. (See also Board.)

Where the wall board is to be fixed over brickwork or plaster, battens or furring strips should first be attached to form a frame on

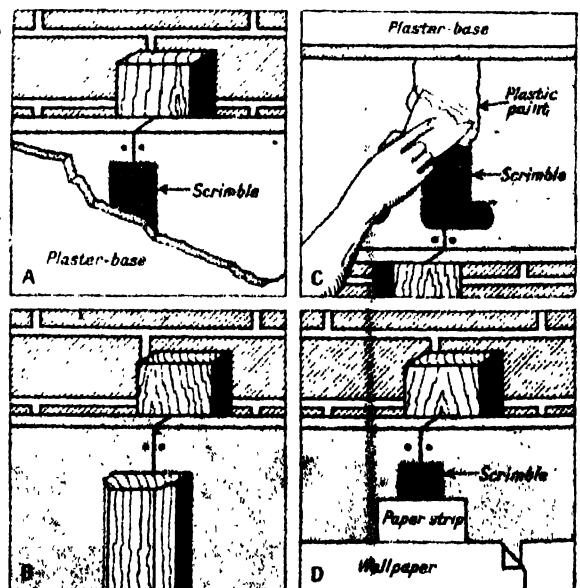


Fig. 2. Diagrams showing varied application of wall board. A. Showing plaster-base applied in sheets before plastering. B. How panelled effect is obtained by using large sheets of wall board. C. Treatment of internal wall, showing use of plaster base. D. Internal wall covered with wall board and papered.

Patent Impervious Millboard Co., Ltd.



Wall Board. Fig. 3. Showing how the home worker can use wall board to partition off a room. The material shown is Essex board.

Copyright of Pioneer Board Mfg. Co.

which the panels may be nailed. The frame-work should be spaced to suit the width of the panel. It must be secured to solid material, and to this end it is best to plug the walls before nailing or screwing on the battens. If the plaster is bulging or broken away, or the surface to be covered is found to be uneven, nail packing strips made from old pieces of the wall board may be tacked underneath. It is important, where the wall board is applied to a plastered ceiling, to ascertain that the panel coincides with the joists.

The space between adjacent panels is covered with an ornamental strip of wood, which gives the paneling effect to this class of work. A convenient size for this strip measures 2 in. wide and $\frac{1}{2}$ in. thick. Before nailing the strip over the wall board, the latter should first be painted, taking care that all holes not covered by the paneling strip are stopped. In fixing the paneling strips the vertical strips should continue unbroken if a sense of additional height is required.

A useful application of wall board is in dividing a large room into two smaller ones by means of a partition (Fig. 3). Information about this is given in the article on Partition. In the event of a window or ventilator

cutting into a sheet of the wall board, the latter may be cut to shape as required with a cross-cut saw. To cut a straight strip from a length of the wall board it may be heavily scored with a chisel and bent off at the weakened line, the board being supported at the score by placing it against the edge of a bench. Rough cast wall board is cut in a similar manner with the score on the smooth side. The rough side is then broken off by continued bending. See Asbestos, Paneling, Partition, Plywood.

WALL CRESS. This name is often given to the white arabis, a low growing spreading plant which bears a profusion of flowers in spring. See Arabis.

WALLFLOWER. The modern varieties of this favourite plant are invaluable for spring flower beds; there, in association with daffodil, tulip and forget-me-nots, they provide charming displays of bloom. The colours of the modern varieties range from white through primrose to yellow, orange, and dark crimson. Purple Queen, Lacie Queen, pale lemon yellow, and Primrose Monarch are varieties of unusual colouring. Wallflower, raised from seed sown out of doors on a reserve border in May, the seedlings are transplanted at 10 in. apart to give them room for development, and in October they are set out where they are to bloom. When the seedlings are transplanted it is a good plan to pinch off the end of the taproot and the leading shoot; this will ensure well-branched, sturdy plants.

The Siberian "flower" (*Chamaejasme Allionii*) which bears orange-coloured blooms, makes a magnificent display. The seeds should not be sown before the end of May or the plants may bloom prematurely. There is an early flowering strain of wallflowers which

blooms in mild weather in autumn and winter, and is in full beauty in spring. Wallflower, an excellent window box plant, and will flourish on a dry stone wall.

The double wallflowers are grown in pots for the decoration of the greenhouse in spring. Seeds are sown in a box of soil set in a frame in July and August, the seedlings being potted singly in small pots and subsequently into others 5 in. wide. Some of the wallflowers, e.g. alpinum, light yellow, and Mar. hildii orange, are pretty plants for the rock garden, where they should be set in light soil in a sunny place.

WALL GARDENING. A dry wall, that is, a wall built without mortar or cement in the joints, can be made a very beautiful feature of a garden if planted with snapdragon, wallflower, valerian, aubrietia, arabis, yellow



Wallflower. Flowers of the single variety which is known as Primrose Monarch.

lily-silene, silvery saxifrage, pink, sun-rose, stonecrop, dwarf phlox, and other suitable flowers.

If the wall is shady it provides a home for ferns, foxgloves, ox-eye daisies, toadflax, mossy saxifrage, fumitory, and bellflower. Seeds mixed with a little moist soil may be sown in the cracks of the wall in spring or late summer, or small plants can be set in spring or autumn. A bank provides an excellent site for a dry wall; or a double wall may be constructed in the open garden space, being left in the middle for well drained soil. In building a wall care must be taken that it slopes backwards from the base, so that all the plants receive their share of the rainfall.

Fruit Growing on Walls. On a sunny wall it is possible to grow fruits of the highest possible quality. Fan trained or single or double stemmed cordon trees are most suitable. Planting should be done in autumn in deeply dug ground enriched with basic slag or bonemeal, and it is beneficial to add old mortar rubble freely to the soil in which stone fruits are to be planted. Care must be taken to set the stems of the trees about 12 in. away from the wall.

A wall facing south or south-west is suitable for peach, nectarine, apricot, fig and the choicest dessert pears. Plums and pears will thrive on a wall facing west. Sweet cherries are suitable for an east wall, and on a north wall the Morello cherry and cordon gooseberries and currants may be planted. In cold northern gardens it is worth while planting some of the choicest dessert apples against a sunny wall. For a south or south-west wall:



Wall Gardening. An old wall provides an ideal home for pink and mauve aubrietia, alysium, arabis, silvery saxifrage, pinks and other suitable flowers.

peaches, Hale's Early, Peregrine, Bellegarde, Barrington and Waterloo, nectarines, Elruge, Hardwicke and Humboldt; pears, Doyenné du Comice, Bergamot d'Espéren, Bourré Superfin, Fondante d'Automne, Glou Morveau, Marguerite Marillat and Winter Nelis, plums, Coo's Golden Drop, Comte d'Althaus's Gage, Early Transparent Gage, Jefferson and Oullin's Golden Gage.

For a west wall the pears and plums already mentioned are suitable. A wall facing east will provide excellent crops of sweet cherries, e.g. May Duke, Black Tartarian, Early Rivers, Frogmore Bigarreau, Kentish Bigarreau, and Knight's Early Black.

WALLPAPER. The most important thing to do when wallpapers have to be chosen is to make up one's mind to a definite scheme of treatment. Every room has, by reason of its use, a character which is emphasized by its furnishing and which can be made a key to the problem of its decoration. The personal factor must not be relegated to a secondary place, because decoration should be the expression as well as the environment of personality.

Whatever the purpose of the room, there are certain general considerations which are of importance: aspect, lighting, size and proportions are conditions which must influence choice. Rooms facing north require tints which suggest warmth; south rooms can be treated with schemes in cool colours.

Effect of Lighting. Window space and the conditions imposed by artificial light should regulate the shade of the wall covering, whether it is to be light and so capable of refraction, or whether shades which absorb light can be used. Insufficient light, whether natural or artificial, is a fault which, if it cannot be remedied, must be corrected by the colour and texture of mural coverings if possible.

The effect of light can be attained by ensuring such contrasts of colour and shade as will make objects easily seen which would be otherwise indistinguishable. A wallpaper having a light background with well defined pattern will carry out this idea, or a brightly coloured border having distinctive forms and sharp contrasts will perform the same service.

In this connexion it must be remembered, however, that what is easily seen seems to be near at hand, so that easily seen patterns may appear to reduce the size of a room; whilst, on the other hand, if it is desired to make a room appear larger, indefinite patterns in low tones of colours, tending towards greys, will give the effect of space. The principle might be summed up thus: whatever the eye sees clearly is imagined to be near at hand, whilst haziness and indefiniteness are mentally associated with distance. The apparent size of a room is materially affected by the volume of light which enters it, or is provided by the proximity of the colour of the walls to white. Light and spaciousness are closely related, whilst shade and dark colours suggest closeness and enclosure. The effect of colour is dealt with in the article under that heading, and that of texture of wall coverings in the article on Decoration.

Use of Pattern Papers. It is not surprising that woven and printed fabrics, embossed leather and other materials which have been used for wall coverings are closely imitated in appearance and texture on wallpapers. There are papers having the appearance of canvas and hessian, produced by printing and embossing, which make excellent wall coverings for rooms which are much used. The design in popular use in the 18th century for printed linens and cotton hangings, and the hand worked embroideries which preceded them, have been followed most successfully on wallpapers, and are satisfying for many bedrooms and sitting rooms where the appear-

ance of brightness is desired. There is a series of such papers known as chintz papers, some based on the designs of Queen Anne embroideries which are most attractive, recalling rooms in country houses with period furniture.

For dining rooms, hall, landings and staircase, patterns based on tapestry designs have the advantage of traditional associations in their favour, and also of not showing marks. Many are well produced and can be obtained in a wide range of colourings. *Sourette* is the name given to a type of paper with silky surface which is used for drawing rooms, bedrooms and other rooms where delicate tints are suitable, and the furniture is highly polished and somewhat French in design.

Of the unpatterned papers which are called semi-plains there is sufficient variety in colour, type and texture to suit every kind of room. Here again materials which are used for wall decoration are imitated in wallpaper, notably leather of many kinds, oak and other kinds of wood grain, plaster of rough-cast and trowelled finish. The suitability of this range of papers for particular rooms depends on their colouring and their degree of finish; they are, however, in general use for living rooms and hall and staircase walls. Effects resembling old parchment are much favoured for modern decorative schemes and other suitable types resemble stippled and mottled paintwork.

The delightful blending of colours found in marbles of many different kinds has given inspiration for a great range of well produced papers in soft tints, but without any attempt at imitative rendering of actual marble. Other represent marble with varying degrees of accuracy, and these papers are excellent where Regency or Empire effects are liked.

Some imitations of marble are popular for bathrooms while others are used in narrow widths as surrounds for doorways, windows and niches. Recently there has been a revival of the use of marble papers for staircase and landing walls, when hung horizontally and panelled out to represent slabs; the result is impressive.

Motifs and Panels. A form of wallpaper decoration which has become increasingly used within the last few years is achieved by the use of appliqué motifs which are made in a great number of types and sizes. There are motifs for corners of panels, pendants for use with cut-out borders independent

of ornaments for centres of panels, over mantelpieces, bed heads or other positions where attractive colour is desired. All these present little difficulty in arranging. If there should be doubt they can be separated from the surrounding paper on which they are printed, and pinned up to judge of their suitability before actually pasting on to the background paper with which they are used. Another type of motif is designed for use above skirting or dado rail and takes the form of groups of flowers of varying height and width. Some of these are very extensive, and are of sufficient height to reach from skirting to picture rail. Their arrangement is not difficult, for with them are generally supplied illustrations showing how they can be adapted. A floral panel and an applied tree motif are illustrated in the article on Decoration.

Corner ornaments are used to enrich panels, which are arranged symmetrically to cover the wall space. Such panels are formed by using a "stile" or "stiling border." These borders are obtainable for use with appliqué motifs, and in several different widths. First the stile is hung under the picture rail and above the skirting, all round the room, then the stile is hung vertically at angles. If there are large wall spaces the stile can be used to form divisions between angles, the lengths being pinned up before pasting so that the proportions of the panels can be adjusted pleasantly.

It should be remembered that these fancy styles of bordered panels look better if one dimension is considerably greater than the other; if both dimensions are nearly equal the effect is not so pleasant. Square panels of this type are uninteresting. Panels in the proportion of 7 ft. high and 5 ft. wide are pleasing, and the narrower the panels in proportion to their height the greater will be the effect in increasing the apparent height of the room. Panels which are wider than their height will make a room appear lower.

Assistance in connexion with choosing motifs and simulated panelling can be found in the illustrated booklets which are obtainable from most up-to-date decorators. In the article on Hall the attractive use of a landscape motif on a marbled paper is illustrated, and also of a linearista panelling. See Colour Decoration, Frieze, Hall, Panelling, Paper-hanging, Paste.

WALL PLATE. This phrase is applied generally to almost all types of horizontal timber set upon the top or some other part of a wall to act as a support for joists, rafters, or the like. In a normal two-storey house three principal wall plates might be used. On the ground floor if the floor were made of boarding, the joists would rest upon a horizontal plate of wood set upon the lower part of the brickwork; this horizontal plate being known as the wall plate.

A somewhat similar arrangement may be adopted for the first-floor joists, except that the wall plate would either be supported on corbels or, preferably, built into the wall itself. On the top of the wall a horizontal member, also known as a wall plate, is provided as a means of fixing the roof rafters and ceiling joists. See Joist, Rafter.

WALL RUE FERN. The popular name of the fern which is known botanically as *Asplenium ruta-muraria*; it thrives admirably in the crevices of a shady wall. See Fern.

WALNUT. The fruit of a deciduous tree, *Juglans regia*, which grows to 60 ft. in height. The edible nut is within a wrinkled two-valved shell enclosed in a leathery husk. The nut is ripe when the green husk turns brown, in September. The husks yield a brown dye.

Propagation is by seed, sown 2 in. deep, outdoors in light soil, in November; by grafting, in March; by budding, in August. Time to plant is October or November. Pruning is not necessary.



Walnut. Cluster of green-husked nuts

Walnuts as Food. In addition to their use as dessert walnuts are added as ingredients to many dishes that need nut flavouring. Usually they are shelled, peeled, and roasted in a cool oven until they are slightly crisped, and then chopped or broken into small pieces.

One of the simplest ways of using walnuts is to make them into a salad. Toast them, and break them up as already directed, having removed the brown skin, and then mix them with some cleaned and shredded celery. Only the white portion of the celery should be used, and the quantity should equal that of the nuts. Season the mixture to taste, bind it with some thick mayonnaise sauce, and garnish the top with a few halved walnuts. This salad is a good accompaniment to chicken. (See Mayonnaise: Salad.)

For pickling, walnuts should be picked in July, when the husk is still green and the nut is quite soft and small. The nuts are not removed from the husks; the walnuts are pickled as gathered from the tree, after each has been pricked all over with a fork. They are then placed in a strong brine made by mixing 2 lb. salt with each gallon of water used. They should remain soaking for 9 days, the brine being changed every third day; after which they should be drained off, and placed, in dishes, in the sun, for two or three days, when they will have become black. The walnuts are then placed in jars, a space of an inch being allowed at the top, and the jars filled up with boiled vinegar and spices. The vinegar should be boiled for 10 minutes, allowing to each quart of vinegar 2 oz. whole black pepper, 1 oz. allspice, and 1 oz. bruised ginger, this being hot when it is poured over the walnuts. The jars are then sealed in the ordinary way. The contents are ready for use in about a month.

WALNUT: the Wood. This wood is fairly hard, heavy, and close in grain, easy to work and does not warp or shrink much. There is the European variety, the best of which grows in Italy; the American black walnut, which is darker in colour; and another American variety, called satin walnut. The Italian and American black walnut are those chiefly used for better-class furniture. Satin walnut, used for cheaper furniture, is a light brown or yellowish colour with darker streaks, and shows a satiny surface when planed. The others range in colour from greyish to purplish brown, often streaked with darker shades. Walnut is not used by builders, as it often becomes worm-eaten and its durability cannot be depended on.

American black walnut looks very well when treated with a wax polish. The polisher should look carefully for light portions of the wood, and, having found them, should take a small pencil brush and carefully stain them to match the surrounding parts.

The colouring-up of the light portions can be done with a water stain, made by mixing dry powdered vandyke brown with liquid ammonia, and then diluting this mixture to the desired shade, or it can be done with a judicious use of spirit stain, say, walnut crystal, or powdered stain dissolved in methylated spirit. The stain, no matter what variety is used, will raise the grain of the wood, and the usual course of glass-papering down the work must be gone through. Some prefer to rub the work over with linseed oil before using a wax polish. If it is first oiled in this way, it should stand for at least 48 hours before the wax compound is applied.

Another simple way of finishing walnut is by oil polishing. This is generally used for the tops of dining tables, although it is sometimes seen on chairs. The oil polish is far superior to a wax finish, as neither heat nor moisture will affect it. Either raw linseed

oil or boiled linseed oil can be used. American black walnut is frequently french polished. This begins with a preliminary staining, this being done with a water or spirit stain applied to any part of the work that shows signs of light sapwood. No hard and fast rule can be given for the mixing. A good plan is to mix a fairly heavy stain, and to dilute it as required.

The next step is to oil the work. Here again colour must be considered. If the general character of the work appears to border on slate colour, it is necessary to use red oil, otherwise the work when finished will be dull and lifeless. If the walnut has a rich red shade, raw linseed oil should be used. After the oiling come the three successive processes of filling in, bodying up, and spiriting out. These are described in the article on French Polishing.

Walnut Furniture. For articles of furniture, walnut was used earlier on the Continent of Europe than it was in England. In the latter half of the 17th century it was in great favour in Holland, and, with the close connexion between that country and England that began about 1660, much walnut furniture was brought over. About the same time the supply of English oak was diminishing, and walnut began to take its place. The Queen Anne period around 1700 being sometimes known as the age of walnut. In addition to its use for the body of the article, it was much used for veneering, walnut on oak being a popular form. It was used for decorative furniture made in the style of Louis XVI, but in England about the same time its place was taken to a large extent by mahogany. In the middle of the 19th century there was a great revival of walnut furniture, the Italian variety being particularly favoured for fine furniture. See Armchair, Bureau, Cabinet, Chair, Dressing Table, Furniture, Gilding, Grandfather Clock, Marquetry, Mirror, Queen Anne Style, Stool, Tallboy, Veneering; Wood.

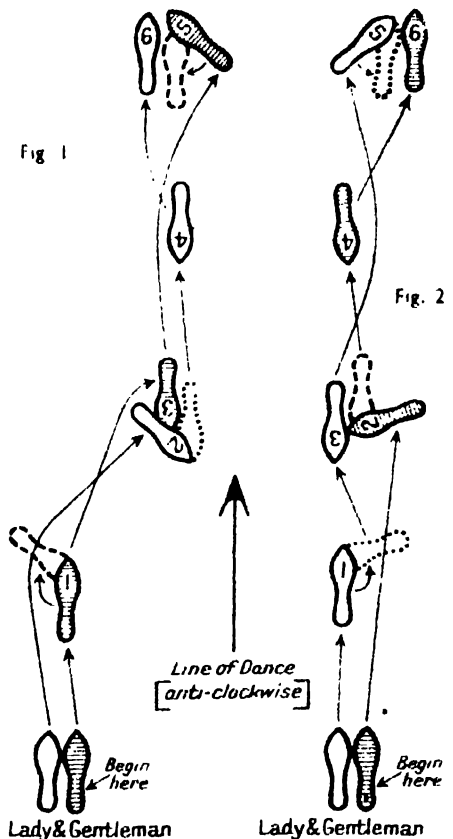
WALNUT BUN. The ingredients for making walnut buns are $\frac{1}{2}$ lb. flour, 2 oz. cornflour, 1 teaspoonful baking-powder, 3 eggs, 2 tablespoonfuls milk or cream, a little jam, and 5 oz. each castor sugar, butter or margarine, and walnut kernels. Put the walnuts into a moderate oven for a few minutes to crisp, and then chop them finely. Cream the butter and sugar, add nearly all the walnuts, then break in the eggs, beating one in well before adding another. Sieve together flour, cornflour, and baking powder, and then add them to the mixture, with the milk.

Beat the whole for a few minutes and put the mixture into small greased tins on a baking sheet. Bake in a good oven until they are firm to the touch. Turn them out and allow them to cool, brush with a little jam and sprinkle with chopped walnuts.

WALNUT CAKE. The ingredients that are required for a plain walnut cake are $\frac{1}{2}$ lb. each butter or margarine, castor sugar, and fine flour, 5 eggs, a good pinch of salt, $\frac{1}{2}$ lb. peeled and chopped walnuts, and 6 bitter almonds peeled and pounded fine. Cream the butter and sugar till very light, add 2 of the eggs, and beat for 5 min.; then add the remaining egg and give another good beating to the sponge. Sift the flour with the salt, add the nuts and mix it very lightly but quickly with the eggs, sugar, and butter.

Put all into a shallow cake tin and bake till firm and a golden brown colour. The time required for baking varies according to the depth of the tin, but the oven must be steady and not too hot.

This walnut cake should be iced with white fondant or French icing, and should be



Waltz. Fig. 1 Steps of the natural turn for both partners. Fig. 2 Those of the reverse turn.

decorated with peeled halves of walnuts placed here and there on the surface of the icing.

A rather more spongy cake is made without butter. Beat together the yolks of 3 large eggs with 5 oz. castor sugar, adding a few drops of water from time to time, in all 1 tablespoonful, and flavouring with the grated rind of a lemon. Mix with $2\frac{1}{2}$ oz. ground walnuts, $1\frac{1}{2}$ oz. wheaten flour sifted with $1\frac{1}{2}$ oz. potato flour, and a pinch of salt, then whip up the whites of the eggs.

Fold the flour and whites of egg alternately into the sponge, putting in about half of each at one time. Bake about 20 min. in a shallow tin lined with greaseproof paper. The oven should be of a moderate heat, and the cake on no account should be moved while baking until it has set. Ice with white icing, or dust the top of the cake with icing sugar and sprinkle over chopped walnuts. See Cake, Fondant; Icing.

WALNUT PUDDING. A variety of bread and jam pudding, with walnut flavouring, this can be made in the following way. Heat up 3 gills milk, then pour it over 3 oz. fine breadcrumbs mixed with $1\frac{1}{2}$ tablespoonfuls castor sugar, and a little grated lemon-rind. While these are soaking, shell some walnuts, weigh out 3 oz. of them and toast them for a few minutes before chopping them finely. Then stir them into the bread and milk mixture, adding also first the yolks of two eggs, and then finally mixing in the stiffly whisked whites.

Grease a small pie-dish, put into the bottom of it 1 or 2 tablespoonfuls of jam, then cover the latter with the pudding mixture, and bake it in a moderately hot oven until it is lightly browned.

WALTZ. There are three fundamental steps of this dance, the natural turn, the reverse turn, and the changes, i.e. changing from the natural turn to the reverse turn and vice versa. In these three main steps

there is only one rhythm, a step to every beat. The music and the steps go in threes, and as the first beat of the music is accentuated, the first of each three steps should be a little longer than the second and third. On the third beat in both the natural and the reverse turns and the forward changes the feet must be closed together.

An important point to observe is the rise, which commences at the end of the first step and continues through the second, bringing the dancer right up on to the balls of the feet on the third step. Contrary body movement (C.B.M.) is used on the first step of every three.

The Natural Turn (Fig. 1). This is composed of six steps. In the first three the man steps forward with R.F., turning on it to R., to side with L.F., still turning, and closes R.F. to L.F., completing half a turn. He then steps back with L.F., turning on it to R., to side with R.F., still turning, and closes L.F. up to R.F., completing the whole turn. When the man is doing the first three steps the girl is doing the last three, and vice versa. It is not always necessary to make half a turn on each three steps, a quarter turn is sometimes used. This depends on the direction in which the man wishes to steer. Contrary body movement is used on the 1st and 4th steps by both man and girl.

The Reverse Turn (Fig. 2). In the first three steps the man steps forward with L.F., turning on it to L., to side with R.F., still turning, and crosses L.F. up in front of R.F., completing half a turn. He then steps back with R.F., turning on it to L., to side with L.F., still turning, and closes R.F. up to L.F., completing the whole turn. When the man is doing the first three steps the girl is doing the last three, and vice versa. As in the natural turn, it is not always necessary to make half a turn on each three steps, but it less than

half a turn is made on the first three steps the man should close his feet together on the third step of the reverse instead of crossing them. The same rule, of course, applies to the girl's step. Contrary body movement is used by both dancers on the 1st and 4th steps.

The Forward Changes (Figs. 3 and 4). 1. After a natural turn the man steps forward with R.F., turning body slightly to R. (C.B.M.), to side with L.F., and closes R.F. up to L.F. The girl steps back with L.F., turning body slightly to R. (C.B.M.), to side with R.F., and closes L.F. up to R.F. 2. After a reverse turn the man steps forward with L.F., turning body slightly to L. (C.B.M.), to side with R.F., and closes L.F. up to R.F. The girl steps back with R.F., turning body slightly to left (C.B.M.), to side with L.F., and closes R.F. up to L.F.

The Backward Changes (Figs. 5 and 6). 1. After the first three steps of his natural turn (1, 2, 3, Fig. 5) the man steps back with L.F., turning body slightly to R. (C.B.M.) back with R.F., back with L.F., only just passing R.F., and finishes with the last three steps of his reverse turn. The girl, after the first three steps of her natural turn, steps forward with R.F., turning body slightly to R. (C.B.M.), forward with L.F., forward with R.F., only just passing L.F., and finishes with the last three steps of her reverse turn. 2. After the first three steps of his reverse turn (1, 2, 3, Fig. 6), the man steps back with R.F., turning body slightly to left (C.B.M.) back with L.F., back with R.F., only just passing the L.F., and finishes with the last three steps of his natural turn. The girl commences with the first three steps of her reverse turn, steps forward with L.F., turning body slightly to L. (C.B.M.), forward with R.F., forward with L.F., only just passing R.F., and finishes with the last three steps of her natural turn. In the diagrams accom-

panying this article the right foot is shaded, but the left is shown in outline only. The dotted line indicates the ultimate position of foot. It will be easier to follow the diagrams which are given in this and the previous page if the dancer faces the direction in which the toes are pointing and turns the diagram at the same time. See Dancing; Fox Trot; Quickstep; Tango.

WARD: In Chancery. By the theory of English law the king is the guardian of every infant (i.e. person under 21) in the country, but he exercises this guardianship through his judges, and only becomes an active guardian when in some way an infant is brought before the court. Any person under 21 may be made a ward of court by someone paying into court a sum of money in which the infant is declared to be interested. The court will not usually interfere unless the infant has some property.

The position of such a ward is that he or she cannot marry without the consent of the court. It is a contempt of court punishable by imprisonment for anyone to marry such a ward without the judge's leave. Ignorance that the infant was a ward of court is no defence in a case of this kind.

The judge has power to order the infant to be placed in the custody of any person he chooses. He can even take a child out of the custody of one or both of its parents and hand it over to somebody who may or may not be a relative.

The National Society for the Prevention of Cruelty to Children uses this weapon sometimes in order to take children out of the custody of undesirable parents. It is a contempt of court for anyone to interfere with such custody or to remove the infant out of the jurisdiction of the court without leave. The wardship ceases when the infant attains the age of 21. See Guardian.

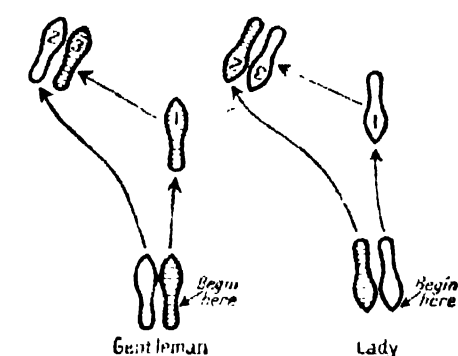


Fig. 3

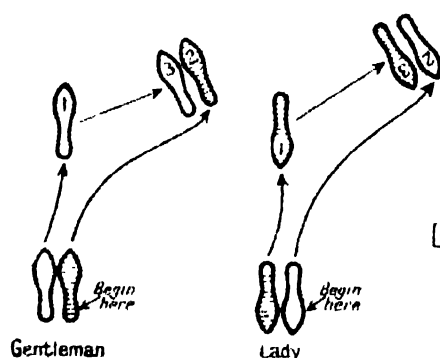


Fig. 4

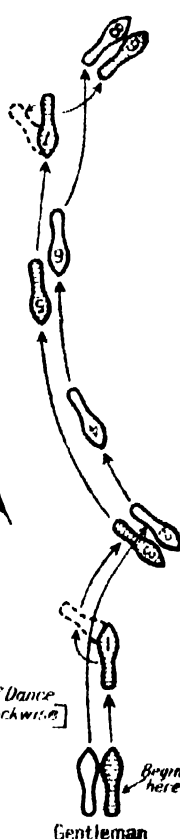


Fig. 5



Fig. 6

Waltz. Diagram showing the various steps and turns. Figs. 3 and 4 show the details of the forward change. Figs. 5 and 6. The backward change

WARDROBES: ANTIQUE AND MODERN

With Designs for a Hall Wardrobe and One in Veneered Walnut

After some remarks on the story of this piece of furniture, this contribution gives particulars, aided by diagrams, about making two types of wardrobe. The worker will obtain further assistance by consulting the entries Cabinet Making; Joint; Polishing; Stain; and others on woodworking processes. See also Bedroom; Corner Wardrobe; Cupboard; Fur; Furniture; Hall

The wardrobe was evolved about the last decade of the 17th century from the hanging cupboard and is a combination of that piece and a chest of drawers. Examples of Queen Anne period pieces are rare, but there is an interesting child's wardrobe dated 1712 in the Victoria and Albert Museum. It is made in the form of a contemporary house, painted to resemble brickwork. The roof has a gable at either end, a hexagonal chimney and dormer windows. There are three rows of small windows across the front. The doorway has pilasters and curved steps.

The centre of the front is hinged and forms the door of the cupboard fitted with clothes pegs. There are two wings, one fitted with small drawers and the other with shelves. It is therefore a complete wardrobe in the modern sense.

About the middle of the 18th century a higher standard of comfort was introduced into bedroom furnishing, and accommodation for clothes improved from the usual tallboy to the clothes press and wardrobe. The clothes press is sometimes known as a "gentleman's wardrobe." It consists of a cupboard enclosing sliding trays and mounted on a low chest of drawers. Most of these pieces were made of plain mahogany, but highly decorative carved pieces were based on a design in Chippendale's "Director."

Hepplewhite also designed and made wardrobes. In one fine example the mahogany piece was inlaid and ornamented with marquetry. The upper part was the wardrobe proper, enclosed by two doors, which were

panelled; and below were two small drawers and two larger ones. Contemporary wardrobes were of painted or lacquered wood. The illustration shows a beautiful piece with a Chinese design in lacquer work made for David Garrick.

Sheraton's designs for wardrobes were usually of mahogany with restrained use of inlay or marquetry in satinwood. The Regency period wardrobes by first-class makers often showed the familiar association of strongly figured woods with brass mountings. By the middle of the 19th century mahogany and walnut wardrobes had reached heavy and vast proportions, and a little later the wardrobe became part of a bedroom suite, including also a washstand and dressing table. Such wardrobes usually have a mirror on one side, in the centre or inside the cupboard door.

Modern Wardrobes. Apart from pieces included in modern suites, which are to be had in mahogany, weathered oak, Jacobean oak, walnut, sycamore and enamelled or painted wood, wardrobes in recent years have again been made as separate pieces either of the compact fitted type or designed to suit a special room. A good example planned for a man's study bedroom looks like a sideboard bookcase, but when open the two sides reveal a wardrobe fitting. The size of the hanging cupboard section is sufficiently large to take a number of a man's suits on hangers and is provided with a sliding rod. The other wardrobe section contains shelves and drawers. The central portion is reserved for bookshelves.

The compact fitted wardrobes are usually in oak or mahogany and are made in three or four sections.

Some designed particularly for men are provided with hanging space, sliding trays, shelves, an extending fitment on which to hang trousers, bootrack and a mirror. Other compact wardrobes are specially designed for women with more hanging space and good shoe and hat accommodation. The fashion for built-in furniture has extended to wardrobes. The illustration here shows one provided with an electric light which goes on when the door is opened and out after the required garment has been selected and the door is closed.

Quite an excellent wardrobe can be made of two whitewood cupboards, a narrow and a medium-sized one, screwed together to make one piece of furniture and painted or stained to match the walls or woodwork of the room. The wardrobe is provided with brass rods for the accommodation of hangers. One cupboard is used for heavy coats, the other being reserved for light dresses, etc. Alter-

natively the narrow cupboard may be fitted with trays or shelves. Ornamental brass-drops or ring handles if the wardrobe is stained, or if painted china or coloured glass knobs, and a lining of glazed chintz finish the piece. The lining is attached with drawing pins a curtain gimp hiding the edges and being caught down with invisible gimp pins.

Making a Wardrobe. The amateur who is desirous of constructing a wardrobe will find it worth while to study such woodworking articles as Cabinet Making, Cupboard, etc. Some proficiency in the use of tools and the making of the principal joints should be acquired before attempting a job such as the hall wardrobe or the veneered walnut article later described. If just a simple piece of furniture is needed which entails the minimum of skill and experience, the cupboard illustrated on page 325 could be modified slightly to serve as a hanging wardrobe. By incorporating a centre vertical partition and fitting the usual shelves, trays and pigeon holes to one compartment a useful man's wardrobe might be built.

On the opposite side a shelf for hats at the top and a rod for boots and shoes at the



Built-in wardrobe with electric light fitted to switch on with the opening of the door. The light is switched off when the door is closed.

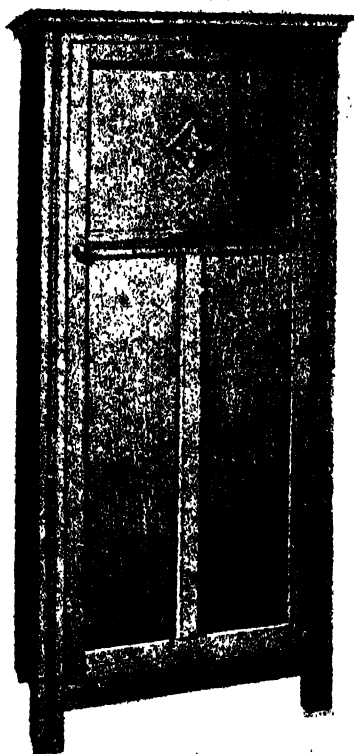
bottom could be contrived, leaving the rest of this compartment for coats and suits, supported on hangers which hook on to a sliding fitting attached to the under side of the hat shelf. A small mirror in a frame can be screwed to the back of one of the doors. The necessary metal fittings can be purchased at an ironmonger's.

Hall Wardrobe in Oak. A length of 30 in. for a hall wardrobe is ample for the small hall. It enables a good many coats to be put away, and does not take up much space. The wardrobe in Fig. 1 is intended to be made in oak. Practically the whole thing can be made up from $\frac{1}{2}$ in. oak for the main framework, and $\frac{3}{4}$ in. oak-veneered plywood. It is possible to obtain ready-grooved oak, the advantage of the use of which is that it saves the somewhat awkward job of grooving. If one has a grooving plane there is no difficulty, but this is not a tool generally found in the amateur's



Wardrobe. This piece of furniture was formerly the property of David Garrick, English, c. 1770

By permission of the Director, Victoria & Albert Museum, 8 Kensington



kit. However, this is a point that the home worker can decide for himself.

Fig. 2 gives the main sizes, and Fig. 3 the general construction. It will be seen that the main carcass consists virtually of four frames—the two sides, the front, and the back. These are made up independently and fixed together afterwards.

Take the two sides first. Each consists of two uprights, four cross-rails, and three panels. Prepare the uprights and mark on them the positions of the rails. Mortise and tenon joints are used to fix the rails. When marking out the mortises on the uprights the over-all width of the rails should be drawn in, and inside lines squared across just inside these at a distance from them equal to the depth of the groove. These inner lines give the length of the mortises. It will be appreciated that the tenons on the rails cannot extend to the full width of the rails because the grooves automatically reduce them.

Marking Out Rails. When marking out the rails it is a good plan to fix them all together temporarily so that all are marked alike. Allowance must be made, of course, for the tenons when cutting the rails to length. The top outer edges of the rails are chamfered. This should be done after the sides of the tenons have been cut but before the shoulders have been formed. When all joints have been cut and fitted the panels can be prepared. The whole unit is then glued up.

As shown in Fig. 3, the back is a similar framework. There is no need to have oak panels; ordinary birch plywood is good enough. Neither need the rails be of oak. The uprights must be of oak, however, as they show at the sides.

There are no panels in the front framework, because the door is fitted here, and no grooves are needed, of course. Before gluing up it is necessary to work the decorative channels in the front surfaces of the uprights and bottom rail. A plain channel in the form of a wide, shallow groove is worked first and a bead formed at each side afterwards. It should be noted that the over-all size of this front framework must exactly equal that of the back.

The four frames are joined together by means of dowels let into the edges of the sides (Fig. 3). In order to make good joints the sides should be carefully planed and fitted against the front and back. It is a simple matter to mark out the dowels so that they coincide, by fixing the joining parts together with a clamp and squaring lines across with a pencil. Then set a marking gauge and mark each line. Dowels $\frac{1}{2}$ in. thick are suitable. Cramps should be used after jointing up, so as to draw the parts tightly together.

centric. It is necessary to stop the chamfer on the bottom rail at the centre where the upright joins it. This is shown clearly in Fig. 5. A moulding similar to that on the top rail is worked at both edges of the centre upright.

The diamond decoration in the top panel is formed by the application of a thin fret with a moulding mitred round the edges. Wrought iron hinges screwed direct to the surface are the most suitable to use. A good finish for the job is a dark oak stain followed by one or two coats of french polish. After this the surface can be well waxed.

Veneered Walnut Wardrobe.

Present day design favours the use of large unbroken surfaces in effect which the work relies for its effect upon the main proportions and upon

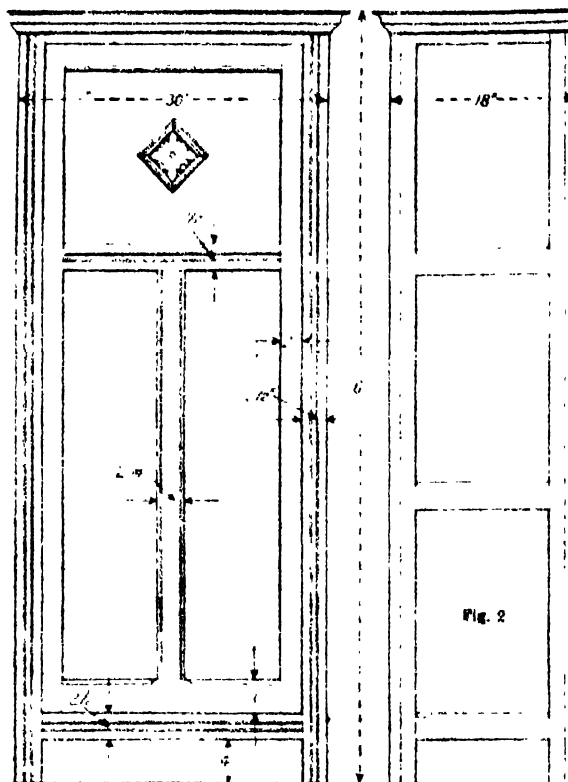


Fig. 2

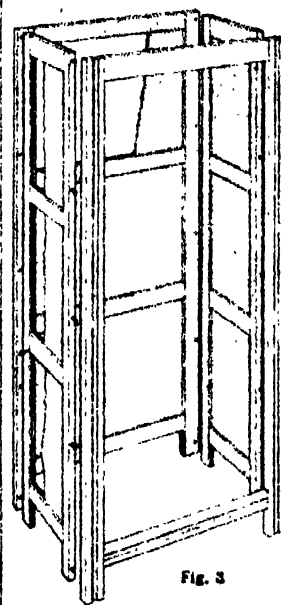


Fig. 3

Wardrobe. Small wardrobe for use in a hall. Fig. 1. Completed wardrobe. Figs. 2 and 3. Working details, together with method of construction.

For the top a piece of plain plywood can be used. If it is intended to use extending hanger rods a piece of solid wood should be attached beneath it to provide a fixing for the screws. Fig. 4 shows how the bottom rests upon fillets fixed to the rails. The addition of the cornice moulding completes the main carcass. This is mitred at the front corners. Shelves can be added if desired.

Making the Door.

Fig. 5 shows how the door is made. The framework is put together with mortise and tenon joints and the inner edges are grooved to hold the panels. A decorative effect is produced by moulding and chamfering the edges. The top rail is moulded at its lower edge. The middle rail is chamfered at the top and has a channel worked along the

beauty of the material. The wardrobe shown in Fig. 6 exemplifies this tendency. The doors have no visible framework, the whole surface being flat. The decorative effect is produced by the use of choice veneers. Another feature typical of modern practice is the absence of a cornice. The doors run right through to the top and are shaped.

The wardrobe gives excellent accommodation. There are three main cupboards and these can be fitted up in any way the worker pleases. It is advisable to give over one entirely to hanging space, with possibly a boot rack at the bottom. The other two can be arranged to have shelves or drawers as desired.

For the main sizes see Fig. 7. Fig. 8 shows how the main parts are made. There are three separate carcasses for the cupboards and a plinth upon which these stand. Each of these four parts is made up as a complete unit. Yellow pine, mahogany, or some other wood suitable to take veneer should be used throughout.

The Carcass. The sides of the centre carcass stand forward beyond the others. The reason is that the centre door must be contained between them, for otherwise it would be impossible to hinge it. The side doors are hinged over their carcasses. In order that the cross-banded effect on the doors may be continued

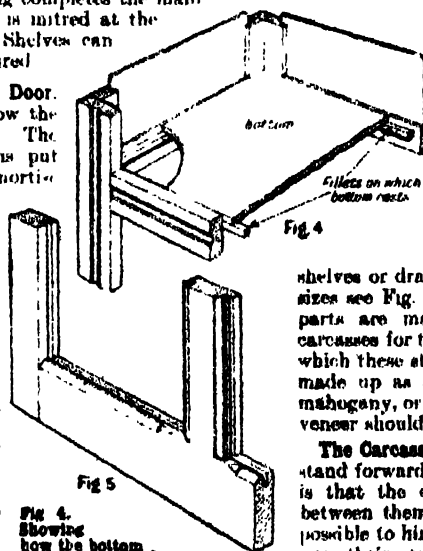
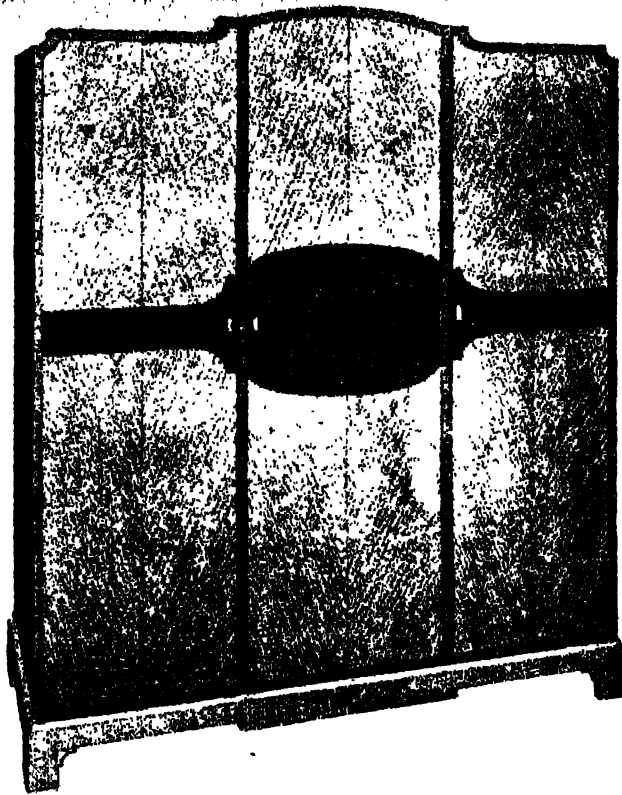


Fig. 4

Fig. 5

Fig. 4. Showing how the bottom rests upon fillets fixed to the rails. Fig. 5. How the door is made.



Wardrobe, e.g. b. Veneered walnut wardrobe with three compartments. It can be fitted up inside to suit any requirement.

round, the front edges of the centre sides are cross-banded. In this way they appear to be part of the doors themselves.

No attempt is made to follow the top shaping of the doors in the carcasses, except that the centre carcass is taller than the other and lined up with the over-all height of the side doors. One important point to watch in making this job is that all three carcasses must be made perfectly square. Otherwise, when they are assembled they will not stand true on the plinth, which is, of course, straight.

Lap-dovetails are used in the construction of the carcasses, as shown in Fig. 8. Dealing first with those at the sides, note that the top and bottom are narrower than the sides by the

(thickness of the back $\frac{1}{2}$ in.). Rebates of this depth are worked in the back edges of the sides to hold the back. This is also true of the centre carcass, but the top and bottom are made narrower still because the door, although it is contained between the sides, loses over the top and bottom.

When the carcasses have been glued up and tested for squareness the backs can be made. These are plain frames mortised together and with grooved-in panels. They are screwed on. If permanent shelves are being introduced these can be either housed in or be supported by fillets. If the former method is adopted the housings should be worked before the carcasses are assembled. It is not practicable to use fillets in the case of drawers, and the rails for them must be housed in.

The Plinth. At this stage the plinth should be made up. Its construction is shown in Fig. 8. It consists of four stout stub feet into which the rails are tenoned. As it has to support a fair weight $1\frac{1}{2}$ in. stuff should be used for the rails. To give additional strength two intermediate rails are dovetailed in between the front and back rails.

After gluing up, the joints are levelled and the surface veneered—the grain of the veneer running vertically. A wide, flat moulding is planted on top. Glue blocks should be rubbed in at the angles to reinforce the whole.

A simple method of making the doors is given in Fig. 9. A main framework of $\frac{3}{4}$ in. stuff is made up and a plywood panel glued over the front. The panel should be veneered

before being fixed to the framework. Note that the top rails must be sufficiently wide to allow for the shape to be worked in them.

Fixing Mirrors. A useful addition to the side doors are mirrors, fixed inside. A quite light frame mitred at the corners can be used. It is shown in section in Fig. 10. A rebated

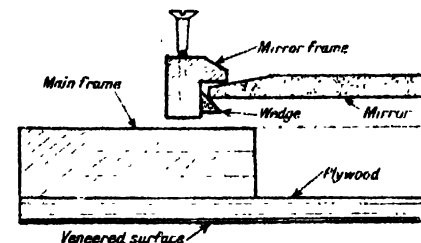


Fig. 10. Details of the method used when mirrors are required in side doors.

picture-frame moulding could quite well be used for the purpose. To secure the mirror the framework is laid face downward on the table and the mirror put in the rebate. The mirror should be about $\frac{1}{8}$ in. smaller all round. Wedges are then glued to the rebate at intervals of 9 in. or so. These hold the mirror without touching the silver. When the glue has set the whole thing is placed on the door and screwed.

The necessary information about veneering will be found in the article dealing with that subject. Other helpful hints are available in the articles Cabinet Making and Joint. If an inlaid or marquetry effect is desired reference should be made again to the specimen articles earlier in this work.

WAREHOUSING. Persons wishing to warehouse their furniture should first of all obtain an estimate from a good firm, who will, if requested, send a representative to look at the articles. The charge for warehousing usually takes the form of so much per van load per week or per month, and it does not include the cost of conveying the goods to the repository. Neither does it include the cost of insuring them.

The warehousing firm will make out an inventory of the goods that pass into its keeping and hand a copy of this to the owner. The firm is then responsible for the safety and good condition of all the articles mentioned in the inventory, but for nothing else, and can be called upon to make good any loss or damage to

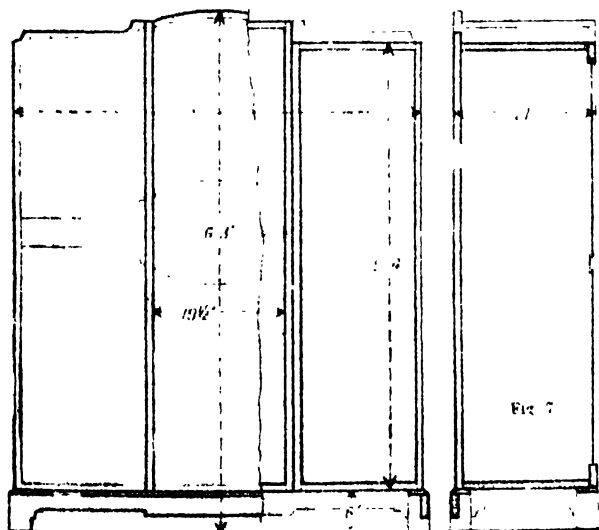


Fig. 7

Working diagrams of the wardrobe illustrated above. Fig. 7. Details of the main measurements. Fig. 8. How the principal parts are assembled. Fig. 9. Simple method employed for constructing the doors, showing mirror at back.

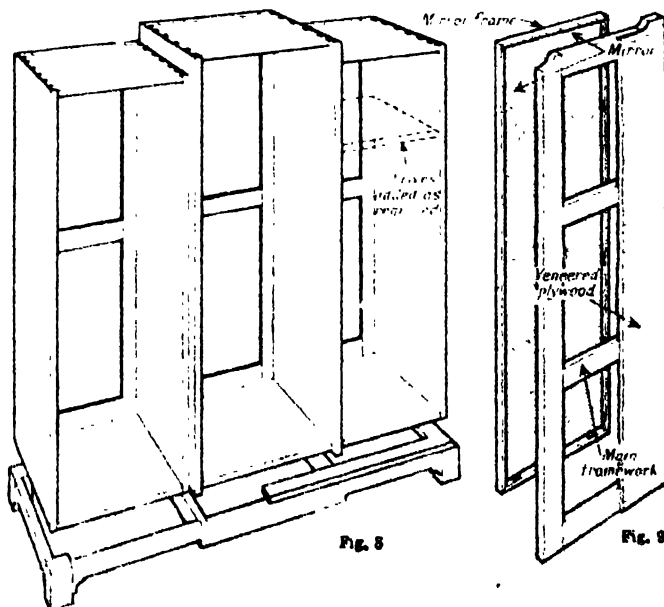


Fig. 8

Fig. 9

them, provided this took place after they had passed into its keeping.

The charges for warehousing should be paid when due. If they are allowed to fall into arrears and the arrears become considerable, the warehousing firm may sell the furniture to discharge the debt owing to it. Before doing this, however, ample notice should be given to the owner, or, if he cannot be found, the intention to sell the goods should be announced in the daily papers. The warehousing firm may also refuse to part with the furniture until all its charges have been paid.

Certain articles, such as pianos, are sometimes warehoused separately from other articles. Most dealers in musical instruments store pianos, and the arrangements for this are practically the same as for other articles of furniture. The storing firm usually undertakes to tune the piano at regular intervals. *See Removal.*

WARMING PAN. A predecessor of the familiar rubber and stoneware hot water bottles was the warming pan, a shallow, circular vessel with a hinged lid made of stout sheets of copper or brass. It was filled nightly during the cold season with red-hot coals and placed inside the bed. It was provided with a long handle, occasionally of iron, but generally of polished wood turned in the lathe. To avoid creasing the sheets, the top, bottom, and sides were made slightly convex in form.

Warming pans were in use from the 17th century onward. Early examples often bear a date engraved or embossed on the lid, sometimes with homely proverbial phrases, or love sentiments, such as one dated 1622 which reads: "God Save King James." These appliances are now in request by lovers of old brass, and they have not escaped the attention of the counterfeiter. They may be kept bright with dry leathers, preferably without metal polish, and should not be lacquered.

WARRANT: In Law. A warrant is a direction under the common seal of a competent court or magistrate, directed to an officer ordering or authorizing him either to seize the property of a debtor or offender, to arrest an offender, or to search a certain place for the actual effects of a certain person.

Warrants for arrest can only be issued by magistrates on sworn information, and will only be issued in the case of serious offences where it may be supposed that the person charged is about to attempt to escape or might run away if only a summons were served upon him. The difference between a warrant and a summons is that a summons is a document that is sent to the offender ordering him to attend the court on a certain day to answer a charge, while a warrant is directed to a police officer ordering him to arrest the offender.

A search warrant is only granted on sworn information and on strong grounds. It is very often applied for in cases of breaches of the liquor licence law. If a mistress wishes to search a servant's box on suspicion of theft, her only legal course is to obtain a warrant and have the search carried out by a police officer.

A prosecutor who goes to a magistrate and gives

him information, even though it be false, upon which a warrant is issued by the magistrate is not liable in an action for false imprisonment if the charge turns out to be a false one, though he may be liable in an action for malicious prosecution. Any police officer who arrests an alleged offender without a warrant is not liable to an action for false imprisonment if he can prove he had reasonable cause for suspecting that a felony had been committed and that the person arrested had committed it, or that he made the arrest to prevent a breach of the peace.

A private person, on the other hand, who arrests a suspect without a warrant must be prepared to prove that a felony actually had been committed, and that he had reasonable grounds for suspecting that the person whom he arrested had committed it. *See Summons.*

WART: How to Cure. A wart is a simple growth consisting of over-developed skin papillae. Warts occur most commonly in young people, on the hands, feet, and scalp. They are contagious.

Warts can generally be treated by applying glacial acetic acid every two or three days. This can be done with the end of a match. Care should be taken to keep the acid off the surrounding skin as much as possible. When warts are large in number and widely distributed, the free use of lime water inwardly has been said to be beneficial.

Care should be taken in applying caustics to warts in elderly people, especially those occurring about the face, as the growth may readily become malignant. The so-called "butcher wart" is a local infection with tuberculosis.

WART DISEASE. This disease, which is known also as black scale (q.v.), has been the cause of immense loss to potato growers. The warts, which form in the eyes of the potatoes, develop into small cauliflower-like growths eventually the whole tuber decays and the soil itself becomes infected.

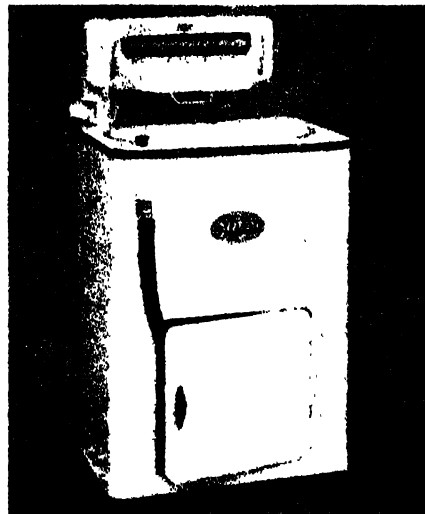
Fortunately the introduction of a race of potatoes which are immune to wart disease has been raised. These may be planted even on infected land. Some of the best potatoes which are immune to the wart disease are (early) Witch Hill Immune Ashted, and Dr. Vernon; (second crop) Arran Comrade, Ben Lomond, Abundant, King George, Arran Banner, and Great Scot; (main crop) Ben Chuachan, White City, Arran Consul, The Bishop, and Golden Wonder. Popular varieties of potato which are liable to attack by the wart disease and must not therefore be planted on infected land are King Edward, Duke of York, Sharpe's Express, British Queen, Arran Chief, and Up to Date.

WASHER: For Clothes. Where a good deal of laundry work is done at home, the task is simplified by the use of a reliable clothes washer. These machines are classed as gas, non-gas or electric washers. The gas models are provided with a gas burner, a heat retaining outer cover and constructed with a copper tank. Models are also obtainable which are complete with wringers and table tops. Deferred terms can be arranged for British washers which are fully guaranteed.

There is no complicated mechanism, and in most washers the agitator produces the action of hand-washing by means of which fabrics are stirred, squeezed, and rubbed. Embedded dirt is removed by the vigorous swirling of the agitator. It is inadvisable to place coloured articles in a washer while it is dealing with white articles, because the colours might

run. Mechanical washers should not be used for delicate lace articles, and woollens should not be left in the machine too long.

A vacuum electric washer has no moving part. The soapy water is drawn through the weave of the fabric fifty times a minute by



Washer for Clothes. Complete with automatic wringer, this all-electric washer runs off an ordinary domestic power-point and takes up little room.

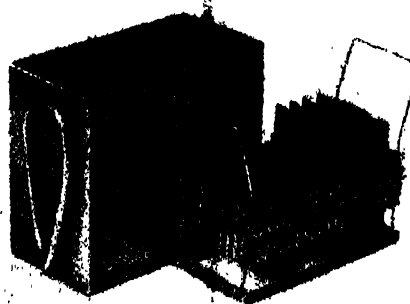
See Electric Washers.

the siphon action of the vacuum washer. A tablespoonful of soap flakes are placed in the bottom of the washer tub, the clothes are dropped in and the tub filled with water. The unit cylinder is then dropped into place and the machine is plugged to the nearest electric outlet for 20 minutes. The soapy water is then poured away and the clothes rinsed in a similar manner to that of the washing operation, but only immersed for a few minutes. *See Laundry.*

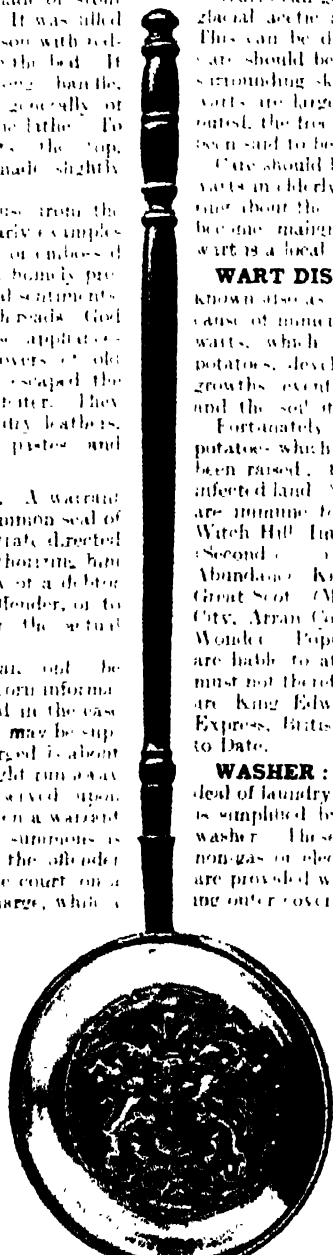
Washing. *See Laundry.*

WASHING. In Photography. The importance of washing thoroughly all plates, films, and prints cannot be too strongly emphasized. Prints or negatives which are insufficiently washed will inevitably develop stains and spots, or else the prints, particularly if made on gelatin chloride paper, will gradually fade until the image disappears altogether. As many prints and negatives are spoiled by insufficient washing as by any other amateur fault. The object of washing is to remove all traces of hypo (sodium hyposulphite) and free silver.

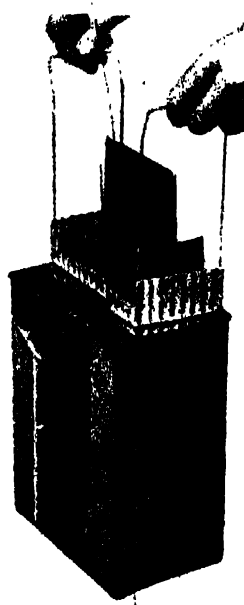
By thorough washing is not meant prolonged washing. It is quite possible to wash a print in a deep dish, from which the water overflows only at the top, for 10 to 12 hours, and still find traces of hypo. The reason is that hypo solution is heavier than plain water, and sinks to the bottom. Although various hypo eliminators have been recommended from



Washing in Photography. Fig. 1. Washing tank for plates. It is in japanned tin and fitted with a syphon.



Warming Pan in embossed brass. Courtesy of Country Homes, supplies.



Washing in photography.
Fig. 2. Excellent type of washing tank

print is allowed to stay in the water for 7 or 8 min., the dish is rinsed out and then filled again with fresh water. If this is repeated eight times the most delicate chemical test will reveal no trace of hypo.

Apart from the use of the commercially made washing apparatus, several methods are open to the amateur photographer. The points to bear in mind are that the water must always be able to run away from underneath, that the water must have free access to both sides of roll films, and these must not be allowed to curl up or to get into violent motion which would cause scratches and other damage; that prints should not be allowed to stick together; and finally, that postcards and prints on thick paper must be washed for a considerably long time than other prints, since the hypo is present in the pores of the paper as well as in the film. In practice, if the washing methods are sound, the following times will be sufficient.

Glass plates and bromide and gaslight prints on light-weight paper, $\frac{1}{2}$ hour. Roll films and ordinary P.O.P. prints, $\frac{1}{2}$ hour. P.O.P. postcards and heavy-weight prints, one hour. These times will allow a certain margin of safety.

Glass plates may be placed in a clean sink

time to time, there is no doubt that water, properly used, supplies the quickest and best means of removing hypo. Experiment has shown that 10 min. really efficient washing is sufficient.

The amateur must not imagine that he will be safe if he washes his plates or prints in a sink or bath under a stream of running water for so short a period as 10 min. The most efficient method, though rather tedious, is to immerse the negative or print in a dish in successive changes of water. The

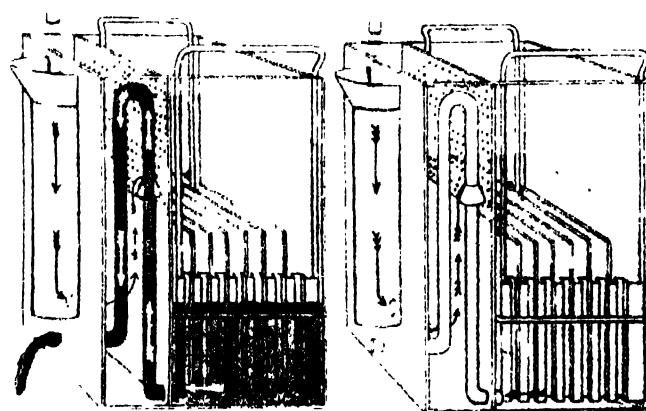
under a gently flowing tap, if means are adopted to prevent them being washed over and blocking up the outlet, so causing the sink to fill and overflow. Adjust the flow of water so that all the plates are sufficiently covered with out the stream being so violent as to move them about. Flat films and prints may be washed in a bath with the waste plug nearly closed and the inflow regulated so that the water level remains constant. Each film or print is floated by means of a cork in which a nick has been cut with a sharp knife,

the corner of the print being inserted in the nick. A large cork can be cut up into a number of sheets about $\frac{1}{4}$ in. thick, each sheet being nicked. The water flow will keep the prints on the move, while the corks prevent them sticking.

Roll films can be washed by a similar method if larger pieces of cork are attached at both ends, at one corner and also one or two others along the edge, so that the film is suspended edge downward in the water while the cork prevents it rolling up. Any risk of damage to the surface of the film while wet is avoided by the use of wooden spring clips to which the corks are attached.

Washing tanks for plates in japanned tin or zinc can be obtained in various forms. A simple form is shown in Fig. 1 which holds 12 quarter plates or 6 half plates. It is fitted with a syphon so that the water is removed from the bottom of the tank. A better form is shown in Fig. 2. Here a complete change of water is obtained every minute. The principle is seen in the diagrams Figs. 3 and 4.

An effective print washer is illustrated in Fig. 5. It is connected to the tap by a short length of rubber tubing and so shaped that the water is constantly in a circular motion,



Figs. 3 and 4. Sectional view of tank shown in Fig. 2. Left, syphon shown in full action, hypo laden water (coloured dark grey) being removed, and fresh water (coloured light grey) taken in. Right, when water level reaches bottom of inverted cone on inlet of syphon tube, a hole admits air to syphon and stops water discharging. The whole process is then repeated.

Courtesy of W. Butcher & Sons, Ltd.

carrying the prints with it. This washer can be obtained with a metal rack to take plates.

Where a considerable number of prints have to be washed, special types of washer can be obtained in which the large numbers of prints are kept in constant rotation by means of apparatus resembling a turbine.

A simple test for the presence of hypo, which will indicate whether washing is efficient, is applied by allowing the last drop from the negative or print to fall into a tumbler and adding a little water faintly tinted pink with potassium permanganate. If hypo is present the pink tint will disappear immediately. See Bromide Paper, Fixing, Negative, P.O.P. Printing.

WASHING POWDER. For washing clothes and other domestic purposes special soap preparations are sold in the form of powders. As some are injurious to fine materials only those produced by reliable firms should be used, and the powder should be dissolved in the washing water before the clothes are put in. Washing powders will make a quick lather, and are less wasteful than soap. They may be employed also for dish washing, and are more satisfactory than solid soap for use with washing machines. See Laundry; Soap.

WASHING-UP IN THE HOME

How Modern Methods Lighten this Domestic Labour

This article gives suggestions on the daily cleansing of china, glass, and silverware, and also of cooking utensils. Other articles that may be consulted are Drainage Board, Hot Water Supply, Kitchen, Scullery; Sink; Water

There are many devices for lessening the drudgery of washing up after meals and cooking. The most expensive is a dish washing machine and the least costly are mops. In the larger household the former appliance is probably worth while. A combined clothes and dish washer is obtainable in three models, hot water, gas and electric, and converted from one of its cleansing uses to the other by the simple interchange of two fittings. The floor space required is 20 sq. in.; the machine washes and dries all classes of crockery. There are several other types of washing-up machines on the market, the general principle of these being that hot water is sprayed on to the plates, etc., and when the hot water is turned off they are dried by hot air.

Apart from such a machine, the task of washing-up is made less fatiguing by the use of plate racks, draining boards, and various other devices. A plate rack fixed over the sink or draining board does away with the necessity of drying plates and dishes, provided they are thoroughly rinsed. An improved type of rack is made to hold cups and tumblers in addition to plates. Some are made so that they can either hang on the wall or stand on the drain-

ing board. Sinks should, when newly installed, be placed in a good light and at a convenient height to obviate stooping too much while working. Where an existing sink is too low, boards made of wooden slats raise the height of the washing-up basin.

Portable draining boards are made to clip and clamp on the side of the sink. These are useful in sculleries where the sink is immediately next to the door or passage-way, and where a fixed board is not possible.

Inexpensive Aids. Paper mâché or wood pulp bowls are more suitable than those of metal for washing up glass and china, as they save a number of pieces from chipping and breakage during the year. A long-handled mop saves the hands. A plate scraper should be used to remove particles of food and grease from dishes, etc., before putting them into the water. A little pad is obtainable for cleansing and polishing knives.

Bottle brushes are invaluable for decanters and other narrow necked vessels, whilst fresh tea leaves may be used to remove stains from the inside. A spiral rubber mop can be obtained which is excellent for cleansing glass bottles. Wire-headed brush mops are useful

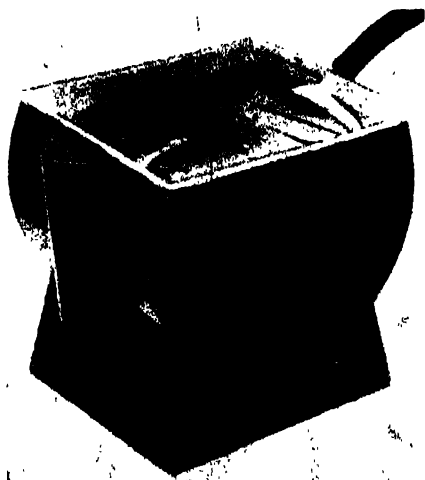


Fig. 5. Print washer so shaped that, on connecting it to a tap with rubber tubing, the water and the prints are kept in a circular motion.

Courtesy of W. Butcher & Sons, Ltd.

for detaching particles and grease from saucepans while a scouring glove and a metal scouring pad are both practical aids for the same purpose.

The cleansing of greasy articles is greatly assisted by the use of soap or soap powder in the water, so as to provide a lather. The small pieces of soap that accumulate in a house can be utilized in this way by being put into a wire soap-saver. The oddments are placed in the cage of this and boiling water poured on to them, a few whisks with the soap-saver quickly producing a lather. To soften the water and to save soap, a little washing soda emulsifies grease and makes it easy to remove. Those who find that soda has a harsh effect on the hands and causes cracks should put a table-spoonful of borax instead of the soda in a medium-sized basin of water. Rubber gloves are suitable in cold weather for anyone whose hands quickly chap and crack. If the insides of the gloves are sprinkled with French chalk before use they do not stick to the hands.

Efficient Procedure. Whether the washing up is done by hand or machine, plenty of hot water must be available. This is an important matter to be seen to when moving into a new home. For a small amount of washing up a kettle or large saucepan can be boiled. In a gas oven, after the gas is turned out, there is usually sufficient heat retained in the oven to heat a basinful of water, if it is not quite hot enough a few minutes over a small gas ring will bring it to the right temperature.

Where there is no constant supply of hot water from the range or from an independent boiler, a supply is obtainable at a minimum cost by the use of a small gas or electric water heater placed near the sink. In districts where electricity or gas is not available, a rapid water heater may be installed for use with paraffin oil or an oil stove will supply sufficient hot water.

When the washing up is actually done in the sink or in a basin standing in the sink the right hand draining board or a small table placed against the right side of the sink is the most handy position for the dirty things. Where there is a pantry, finer china, silver and glass ware will be washed at the sink there the cooking utensils and crockery, etc., being done in the kitchen.

First remove all scraps, remains of food, and grease from plates, spoons, knives, and forks. A piece of newspaper can be used for the purpose if no scraper or rubber squeegee is at hand. Tea cups and milk glasses should be rinsed under the cold tap. If a little trouble is taken with this part of the work the washing up water will remain comparatively clean.

The things should be washed in the following order. Glass, silver, china, knives and other metal articles, saucepans, and baking tins. A few things only should be washed at a time, and, when there is a good supply of hot water, a better result is obtained and with less effort if the things are rinsed in hot water, drained, and dried at once. The smeary marks frequently noticed on glass and china are due to the fact that water containing soap and soda has been allowed to dry on the articles instead of being removed with a cloth or by rinsing.

When washing china with gilt or hand colouring on it, soda or strong soap powders should not be put in the washing up water, as the alkali is likely to remove the gilt and spoil the colours. Glass requires special care, particularly when new. The water should not be very hot or the glass cracks, being a poor conductor of heat, and the thicker the glass the more liable it is to fly. A small brush should be used to clean cut and moulded glass.

White marks on water jugs and bottles are often caused by hard water that cannot be removed with soap and water. The best way to deal with these is to allow vinegar to remain in contact with the chalky deposit for a

short time, then rub hard with a small piece of cloth moistened in vinegar; the acid in the vinegar dissolves the chalk. A rub with a cut lemon answers equally well.

All knives and forks with handles attached require special care. Whether the handles are riveted or stuck on, they should on no account be put right into the washing-up water, for hot water soon loosens those that are stuck on and cracks and splits ivory. They are best placed upright in a jar or jug partially filled with hot softened water.

To simplify the cleaning of greasy saucepans and baking tins fill them with warm or cold water immediately the contents have been dished up, add some washing soda, stand them on the stove or in the oven, and when ready to be washed the pans will be found to be practically clean. All saucepans, other than aluminium, in which food has been burnt should be boiled up with a strong solution of soda and allowed to soak, as this saves both the time and labour necessary for hard scouring.

After use, the washing-up bowl, mop, dish cloth, scouring cloth, or saucepan brush should be scalded, and then washed in hot soapy water, rinsed, and hung up. Separate towels are required for drying glass, china, and silver and knives. So that they may be easily distinguished, the glass cloth could be of checked linen of medium texture, the china cloth of coarse white linen, and for knives and tins a thick, unbleached linen towel is suitable.

WASH LEATHER. Wash leather or chamois leather is unrivalled as a cleaner and polisher of glass and silver. It should never be used with anything but cold or tepid water; hot water will cook the fibre and render it perished and brittle. After use, the surplus moisture should be wrung out and the leather hung to dry. When thoroughly dry it will be found somewhat hard, but can be returned to its original softness by pulling and stretching.

Wash leather should always be used in preference to other materials for putting the finish on silver and plated articles, after all plate powder or whitening has been removed. It will not only impart a high polish, but its continued use will remove light surface scratches. The best results are obtained by the aid of a small quantity of jeweller's rouge applied as a final operation with soft, dry wash leather.

Grease marks and other stains on articles made of suede leather or cloth with a velvety pile or nap, soft felt hats, for instance, may be removed by rubbing briskly with a clean, dry piece of wash leather. The linings of men's pockets, especially vest pockets, are sometimes made of wash leather. See Glove Window.

WASHSTAND. Except in houses where the bathroom accommodation is limited for the number of bedrooms, or in rural districts where the water supply has to be economically considered, there is a tendency towards the disappearance of the movable washstand as a piece of furniture. They can be bought separately or made to match other bedroom pieces, but are not included in many of the more expensive modern suites. Owing to their partial decline in use oak, mahogany and painted wooden washstands can be picked up in reliable secondhand shops at comparatively low prices.

In some of the newer houses and flats hot and cold water fitted washstands are built into the bedrooms. Such washstands are either concealed in a cupboard, or are planned

on the same lines as a lavatory basin, in more or less expensive styles, and provided with pedestal base or supported on plait legs.

Antique mahogany washstand of corner shape are usually more decorative than practical. Many people cover the top with a fitted board, hiding this with a slipped piece of old brocade, damask or tapestry needlework, and thus convert the washstand into an attractive little corner piece for the sitting-room. See Bathroom, Bedroom.

WASP. Usually in hot weather numbers of these insects frequently invade the house, especially congregating where there is anything sweet, such as jam or fruit. They are not only a great nuisance but, owing to their capacity for stinging, may be a positive danger. They can be killed one by one, or trapped and then killed, but a better plan, if it is possible, is to seek out and destroy their nest.

Treating a Sting. When a person is stung by a wasp, the part begins to swell almost before the first acute pain from the wound subsides. This swelling is generally confined to the immediate neighbourhood of the point of entrance of the sting.

Ordinarily the system is not appreciably affected by the poison in the sting, but in rare cases, and particularly when the victim has been stung in a number of different places, the poison may act directly on the heart. A wasp sting over a vein, when the poison is poured directly into the bloodstream and so carried straight to the heart, is more likely to be serious than one in which the poison enters solid tissues underlying the skin.

A wasp sting on the tongue, lips, or inside the cheek may lead to suffocation through rapid

swelling of throat tissues, preventing air being drawn into the lungs. Not infrequently, as the result of the wasp poison in the blood, a type of nettlerash, which may persist for several days, may break out over the part affected. In some cases this rash may cover the whole body.

The wound should first be carefully examined to see whether the insect's sting has been left behind. If so, this should be carefully squeezed out or re-

moved with a needle or a fine pair of tweezers. If the pain and swelling are severe, a handkerchief soaked in lead-water and laudanum lotion may be tightly bandaged over the part or the old-fashioned bluegag may be employed. Another homely but usually efficacious remedy is rubbing the sting with a strong onion.

Destroying a Nest. Found in the ground or on grassy banks, wasps' nests can be destroyed in several ways, an old method being to burn them out with sulphur fumes. This method, however, is attended with some risk, especially to those inexperienced in the use of sulphur. A good plan is to pour some petrol in the opening late in the evening when the wasps are all in their nest, and seal up the hole with some clay. The next morning a little more petrol should be poured in, and then the nest can be dug out and destroyed. Cyanide of potassium can be used in the same way. The latter should be dissolved in water in the proportion of 3 drams to 1 pint, and carefully squirted into the opening of the wasps' nest with a small syringe.

Trap for Wasps. A wasp trap can very easily be made from a flower pot, a jam jar, and a saucer. The flower pot should be turned upside down, and raised from the ground on three small blocks of wood. The jam jar is then placed over the hole in the bottom of the flower pot, and underneath the whole is the



Wasp. Enlarged photograph of this stinging human arm.



Waste Paper Basket. Fig. 1. Gilded waste paper basket decorated with flowers in brightly coloured raffia. Fig. 2. Waste paper receptacle with wood pulp foundation painted and decorated with old flower print

saucer with some sugar therein. The wasps will enter in the space between the bottom of the flower pot and the earth, in order to eat the sugar. When satiated, they will fly up and through the hole in the flower pot into the inverted jam jar where they will be caught.

To remove the wasps, a card should be placed between the mouth of the jar and the inverted bottom of the flower pot. Keeping the card firmly fixed against the mouth of the jar, this can be removed and immersed in water, drowning the wasps.

WASTE PAPER BASKET. Receptacles for holding waste paper and discarded scraps of other materials are necessary in all sitting rooms and in most bedrooms. They can be bought very cheaply, especially the varieties in wicker cane, rush, imitation leather and cardboard covered with cretonne. Metal baskets are constructed of interlaced steel hoops and various forms of woven wire work.

Woven cane baskets are enhanced in appearance by barbola decoration (see Gesso Work), the contrasting tones of the gold,

silver or other coloured barbola work throwing the ground colour of the basket into harmonious relief. The gilded cane waste paper basket shown in Fig. 1, embroidered in coloured raffia is a variation of the same type. The basket may be bought ready gilded or painted at home with metallic paint. The flowers should be loosely made (see Raffia Work), and two or three shades of pink may be used for each rose, the leaves and stems being worked with green raffia. The basket may be lined with silk and finished at the top with gold galon if desired.

Varieties of parchment covered waste paper receptacles can be obtained either plain or ready decorated. The one shown in Fig. 2 has a wood pulp foundation, is painted green, with a gilded rim and base, and lined with marbled paper. A beautiful old flower print has been used to ornament one side and the whole has then been varnished. Stencilled or hand painted designs would be an equally suitable form of decoration. See Writing Desk Set.

WATCHES AND THEIR MECHANISM

Simple Explanation of Different Types of Escapement

Aided by diagrams this article first describes the working of a watch, and in a subsequent section gives hints on the selection and care of this delicate apparatus. See also Clock

Watches small enough to be carried in the pocket were first invented in Nuremberg, about the year 1600, by Peter Hele, a clock maker, who devised the mainspring. In 1658 a step forward was made by the discovery of the balance spring, and in 1695 Tompion, the great London clockmaker, patented a cylinder escapement. In the early part of the 18th century Graham brought out his dead-beat escapement, while John Harrison invented the compensation balance to counteract irregularities of time-keeping owing to variations in the temperature. The keyless watch appeared during later Regency days, and after 1850 was made in great quantities in, and exported from, Switzerland.

Though watches have usually preserved a round and fairly flat shape, ball and square, oblong and lozenge forms have appeared from time to time. The watch belonging to Mary Queen of Scots, illustrated in this page, was made in the shape of a skull and beautifully wrought.

In the 17th century decoration in enamel

for watch cases and dials appeared. In the 18th and early 19th centuries pinchbeck (an alloy of copper and zinc) was used instead of gold for cases, and was sometimes as richly chased and engraved. Silver was extensively used and other examples had outer cases of shagreen, tortoiseshell, etc. A fairly representative series in order of date is illustrated on page 1384.

The mechanism of the watch will be more readily understood if the article on Clock is first referred to. The number of wheels in a watch has always remained the same, variations in the number of teeth in wheels and pinions being made to suit the different escapements that have been used. The main wheel gears into the centre pinion, which carries the hands. From there the centre wheel gears into the third pinion and the third wheel into the

fourth pinion, to which is fitted the second-hand. The fourth wheel gears into the escape wheel pinion.

Escapements. Various types of escapement have been devised, the first of these being the cylinder or horizontal. This comprises an escape wheel with wedge shaped teeth, which stand up from the flat of the wheel on stalks and work in and out of a steel cylinder, nearly half of which is cut away. On the cylinder is mounted the balance and spring and in swinging it gets impulse from the inclined plane of the teeth rubbing against the edges of the cylinder. This escapement was never used extensively in England as it was found that there was a tendency to excessive wear on the working parts. Swiss watchmakers got over the difficulty by making the cylinder and wheel of hardened steel, and this device is still in use in the cheaper grades of both Swiss and French watches.

Fig. 1 shows a detached lever escapement, typical in the main of the form found in the great majority of modern watches. The balance has a free swing, the pallets B and lever C interposing between the wheel and the balance. Fitted on to the balance staff E is a steel roller D with a jewelled impulse pin F standing out at right angles to the face; the pallets and lever are fixed together and swing on an axis at K.

When the balance swings, carrying with it the roller, in the direction of the arrow, the impulse pin enters the notch of the lever, striking with sufficient energy to move the lever and pallets far enough to release the wheel tooth from the locking face of the pallet. The wheel, actuated by the force of the main spring, now moves forward in the direction indicated by the arrow, pushing the pallet out of its path. By the time that the wheel tooth has reached the end of the impulse face the other pallet will be in position to receive another tooth.

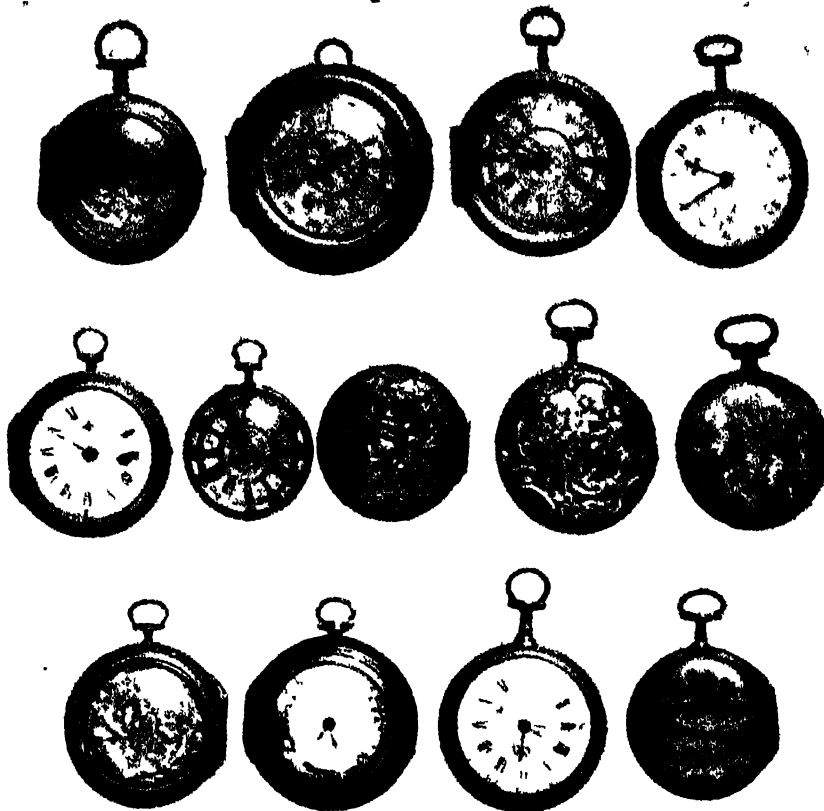
When the pallet was pushed aside it carried with it the lever in the same direction as the roller is travelling, and in its passage it imparts a blow to the impulse pin that sends the balance on with renewed energy. The impulse pin has a dual use, unlocking the pallets by giving a blow on one side of the notch of the lever and receiving a blow from the other. The balance in its swing coils up the balance spring until its energy is expended. Its motion is then reversed by the uncoiling of the spring, when it repeats its operation in the opposite direction.

In the roller a small crescent is cut out, and into this passes the guard pin H to prevent the escapement from unlocking except when the impulse pin is in the notch. There are two banking pins L, set one on each side of the lever to keep the motion of the lever within the desired limits. The locking faces of the pallets are cut back from the radial line, and this causes the teeth to draw the pallets inward towards the centre of the wheel, and the lever is held up against the banking pins so that the guard pin is clear of the roller. The working faces of the pallets are jewelled, J, and are slightly rounded to lessen the friction.

There are some minor variants of this escapement. The Swiss, for example, have abandoned the pointed teeth and use a wheel with what are called club teeth M, Fig. 2—that is, teeth with the tips formed into an inclined plane dividing the impulse face between the wheel teeth and pallets. Some escapements are made with a double roller, the guard pin working on a smaller roller



Watch. MEMORABLE watch, belonging to Mary Queen of Scots and given by her to Mary Beaton



Watch. Typical specimens, 18th to 19th centuries. Top row: 1 Single band watch brass, c 1560. 2 Claud Viet 1696, shagreen case. 3 W Tomlinson 1699-1732 silver. 4 H Massey 1692-1707 silver. Middle row: 5 T Tompion 1639-1713 gold. 6 H Prevost 1710 gold with repoussé outer case. 7 J Shearwood 1789 silver. 8 J Harrison 1693-1776 early work, case in Vernis Martin. Bottom row: 9 Robt Fleetwood, 1780, gold, in shagreen outer case (back). 10 W Collett, 1789, tortoiseshell painted dial. 11 Justin Vuillamy 1739 gold. 12 Ben Taylor 1784 skin.

modern with the impalpable. The chronometer, scraped out, is only used in very high class watches and locks for use at sea.

Jewelling: two methods of which are shown in Fig. 3 is another important part of a watch. The parts of a watch are made from hard materials into the brass plates and cogs. These tend to smooth the running and diminish wear. Some of the pivots run in holes, some in jewels, and some are protected over the outside of the jewel hole. The pivots in the case are held in a bearing on the case and the shoulder of the pivot which is held in one strap of a line.

low of the jewel hole always made this way. The jewels of a watch have no value as gems in this useful function of making for the mechanism.

The Balance. With the ordinary plain steel brass or gold balance changes in temperature cause variations in time keeping, through the metal expanding or contracting. To overcome

this the compensating balance is used, as in Fig. 4. The parts A and B are turned out of one piece of steel, on the outer edge of which is melted a brass band C twice as thick as the steel band B. These two bands are cut through at opposite sides (D) close up to the rim leaving the balance with two free ends.

With a rise in temperature an ordinary balance expands, and in so doing increases its diameter, which causes it to vibrate more slowly. With a drop in temperature the operation is reversed. The remedy for this is a compensating balance. The compensated balance also expands with a rise in temperature, but as brass expands more than steel the effect is that the brass bends the rim inward at the free ends. This causes the centre of gyration to approach the centre of motion in the opposite direction to which the mass would expand, thus restoring the balance to its former shape. Around the rim are a series of tapered holes into which screws E are fitted and these can be shifted from one hole to another to vary the compensation. There are also four tuning screws I which can be used for bringing the watch up to time by screwing in or out, thus decreasing or increasing the diameter of the balance.

The balance spring controls the number of vibrations a balance will make in a given time, so that the strength of the spring is in proportion to the weight of the balance. The usual form of spring is the valve or flat spiral. The inner end is pinned to a collar which is fitted friction tight on the balance staff and the outer end is pinned to a stud in the balance cock or the plate. An over coil or Breguet spring has the outer end bent upward and carried in a long curve over the flat plane of the spring toward the centre, near which it is fixed. The advantage of this type of spring is that it listens in a motion on each side of the centre, thus relieving the balance pivots of a good deal of side motion.

The regulator of a watch is generally a steel index held down by tension right by the end piece on the top of the balance cock. Its axis coincides with the centre of the balance, the index finger pointing to a scale engraved on the

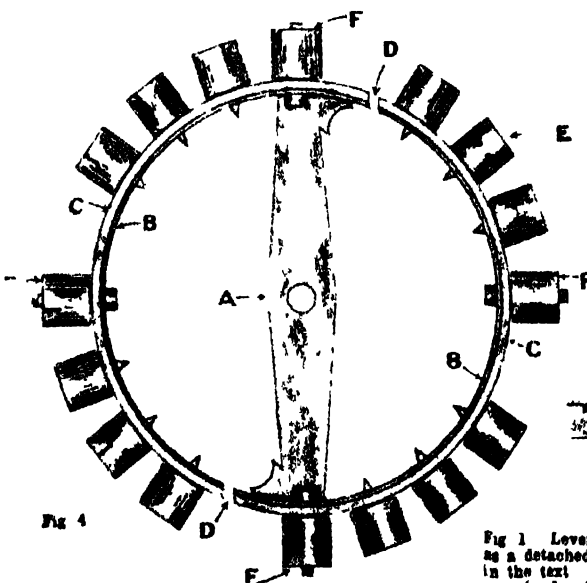


Fig. 4

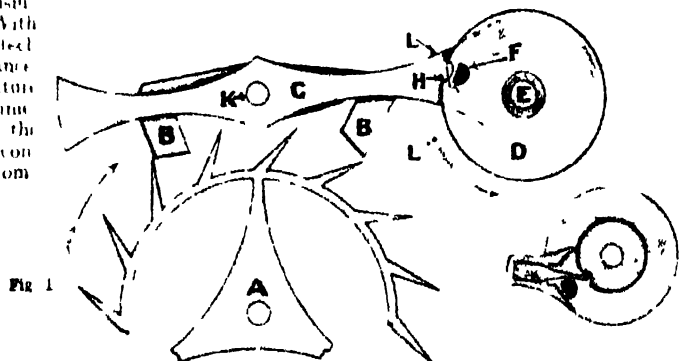


Fig. 1

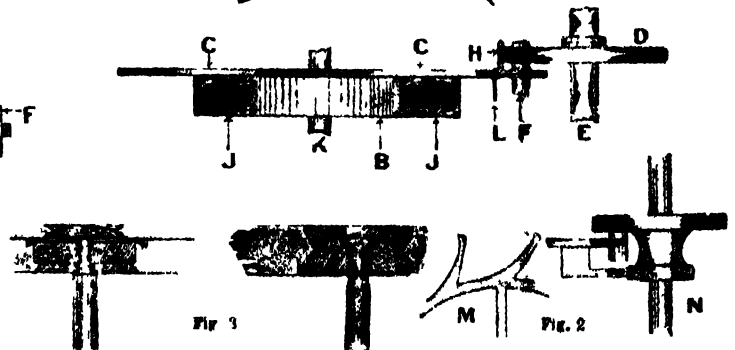


Fig. 3

Fig. 2

Fig. 1. Lever escapement, invented in the eighteenth century, and still the best to-day. It is known as a detached escapement, the balance having a free swing. An explanation of the lettering is given in the text. Fig. 2. Swiss form of escape teeth, club shaped. Fig. 3. Sectional view showing two methods of jewelling. Fig. 4. Compensating balance for counteracting changes in temperature.

on the top of the balance cock. At the other end of the index there are two fine pins standing out at right angles. Between these pins passes the outer coil of the spring, about a quarter of a turn from the pinning-up stud, and from these pins to the centre is the effective length of the spring. As the regulator is moved the pin passes along the spring shortening or lengthening its effective length and therefore making the balance vibrate faster or slower.

The Care of Watches. A watch should be purchased from a reputable watchmaker, who can give much useful information on the question of its choice. It is well to consider the difference between a high grade watch and a cheaper one is of personal importance. The difference, apart from external details, such as the material of the case, etc., is one of service; a cheap article may serve for a time and give tolerably good results for the money paid. While it is uncommon to find a poor movement in an expensive case, it is by no means necessary to have a gold case in order to secure a good timepiece. Reliable movements in silver or other metal cases can be bought at quite moderate prices.

A watch is a delicate piece of apparatus which violence or ill usage will immediately put out of order, causing damage to its finely constructed parts and rendering necessary a visit to a repairer, with its attendant expense. In the average watch there are upwards of 150 parts, some microscopically minute, although, for as size it is a robust as well as a most delicate machine. The watch should be wound at regular intervals, night or morning, and should be removed from the garment at night. To throw down a garment with the watch in the pocket is to risk damage to the delicate mechanism.

The mechanism of a watch is enclosed in a drum or barrel and consists of a finely made steel ribbon. It is the motive force of the remaining wheels, composing the whole train down to the balance wheel, which latter may make as many as 18,000 vibrations in an hour. Regular or irregular beats of the balance will indicate its condition; many watch troubles will arise from a defect hereabout, and on the accurate adjustment of the balance wheel and hair spring depends good timekeeping. The hair spring is so fine and sensitive that it should never be touched by any but an expert; it is most easily damaged and put out of working order, and is usually costly to replace.

The question of periodical cleaning and readjustment is vital to good performance. If a watch is allowed to run for years without this attention the constant running friction will cause the lubricating oil to dry up, or on the other hand it may become thickened. If the oil dries up the effect on the fine pivots, running in dry bearings, can be imagined.

The regulating of a watch when gaining or losing is a delicate operation and is best performed by a watchmaker. The regulator is in close proximity to the balance wheel and hair spring, and if the alteration is made by an amateur a slip with any instrument that may be used may cause considerable damage to these parts. Further, the regulation is not always effectively made with the index or regulator, but may require to be done by way of alteration to the timing screws, to be seen around the balance wheel and none but an expert should venture this. On some watches, again, the index is provided with a tiny micrometer screw adjustment.

The watch pocket should be kept free of dust, since a tiny particle of grit in the working parts will cause a stoppage, and necessitate a cleaning job for the watchmaker. If a watch stops for no apparent reason, it may need re-winding. Apart from this, try gentle pressure on the winder, and if it fails to start, do not tamper with it, since a stoppage then indicates something amiss.

Should the user of a wrist watch inadvertently omit to remove it before entering a bath or the

sea, the case front and back should be opened at the earliest moment, draining out all the water possible, after which the whole watch should be immersed in oil to prevent the steel parts becoming affected by rust. The watch should then be passed on to the watchmaker to deal with. If a watch keeps erratic time, it may be because it has become magnetized. The watchmaker will possess an instrument for testing and demagnetizing which will correct this defect.

WATER SUPPLY AND DISTRIBUTION

Methods in Use in Town and Country

The subject of this article is touched upon in a large number of related entries in this work. A selection of these only is named here, but a perusal will suggest others: Cistern; Drains; Filter; Frost; Hot Water Supply; House; Pipe; Pump; Rainwater; Soakaway; Tap; Well.

The water that forms the domestic water supply is obtained in a variety of ways. Houses in towns and populous districts are almost always connected up with a local supply, and this ensures to the house an amount ample for cleansing purposes of all kinds, and of a quality good enough for drinking.

In country districts water for the former purpose is often obtained by the collecting of rain-water, but this will not serve for drinking. A supply of drinking water, therefore, is often secured by sinking a well, but water from shallow wells in the neighbourhood of houses or of land grazed by livestock should be regarded with suspicion. A good plan is to pass all the drinking water through a filter, a process carried out in many homes. When this is done it is of vital importance that the filter be kept scrupulously clean; the filtering medium frequently renewed, or if of the porcelain candle type, washed and sterilized. If this is not carefully attended to, instead of killing the germs from the water, it will add further germs. Water may be divided into hard and soft, each with its own advantages and defects for washing and drinking purposes. It is quite possible to soften hard water

and this is sometimes done by the company that is in control of the supply. Water softening apparatus for use in the home is dealt with later in this article.

The supply of water for domestic purposes may conveniently be divided into two branches, the external supply to the house and the internal arrangements for distributing. Rainfall constitutes the chief source of all supplies. For the water supply of towns, rivers and lakes are dammed and reservoirs are filled from them. Distribution is effected by means of main pipes. The water is purified by being made to pass through filter beds, which usually consist of concrete receptacles having layers of different filtering material arranged in them. A typical filter bed has at the bottom a layer of large graded gravel, on the top of which is another layer of smaller grade gravel. This again has pea gravel on top of it, and above this a very thick layer of fine washed sand. Distribution from the purifiers to the houses is usually accomplished by gravity, and in many cases the water has first to be pumped to a sufficiently high level to ensure adequate pressure.

With regard to the actual chemical contents of an ordinary public supply, the following analysis may be taken as typical in a rural district in England.

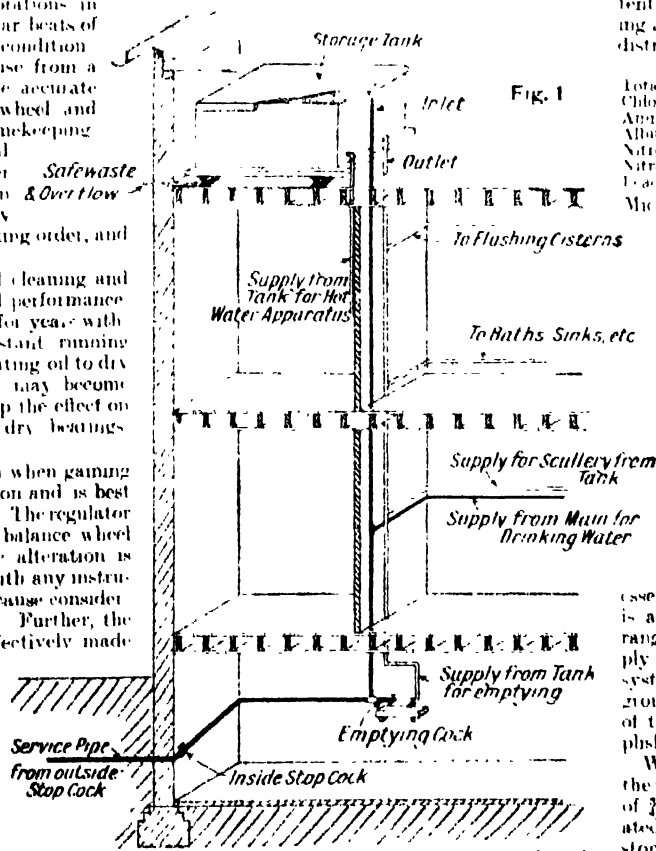
	Grains Per Gallon
Total solids	28.00
Chlorine	1.50
Ammonia	0.00112
Aluminium ammoniac	0.00042
Nitrogen as nitrites	Absent
Nitrogen as nitrate	0.017
Lead	Absent

Microscopic examination revealed a little vegetable debris and mineral matter, and there was the faintest trace of iron.

In the case of country houses water supply may present a considerable problem, and the choice of a suitable system for its collection depends entirely on circumstances. Wells are still in use, and care is required to choose a site where the water is pure and free from decayed animal or vegetable matter.

The House Supply. The internal distribution of cold water throughout a house where a town main exists presents no difficulty, as the pressure is always ample to supply all floors. Where there is no main, however, a tank placed at the highest point available is essential, and the distribution to lower parts is accomplished by gravity. A common arrangement is to use a storage tank for the supply to the lavatory basins, bath and hot water system, the main being connected to the ground floor taps only. Automatic regulation of the water to the tank or cistern is accomplished by a ball valve.

Water from the main supply is carried from the main to the house by a service pipe generally of $\frac{1}{2}$ in. lead pipe, fitted with a stop cock situated below the pavement. The position of this stop cock should be noted and the cover should be examined from time to time to prevent



Water. Fig. 1. Showing entry of main, and also storage tank and internal distribution scheme for an intermittent water supply

it becoming clogged up. The service pipe is carried through the wall of the house at some convenient position, and is then connected up to the main internal distribution pipe. In the event of a burst pipe or during a severe frost the internal supply should be cut off at the stop cock by means of a T-handled key.

The usual arrangement of the supply main is indicated in Fig. 1, which shows how the pipe is brought into a house provided with a cellar. In addition to a stop cock outside the house (usually in the forecourt), it is an advantage to fit an indoor stop cock at the point of entry into the house, as shown. In districts where the pressure is intermittent it is necessary to use a storage tank at the top of the building for use when the main supply is not operating, but in this case a tap should be fitted to the internal main supply pipe so that drinking water is obtainable direct. Storage tanks are also necessary in all buildings possessing modern systems of domestic hot-water services.

The arrangement of the internal distribution of pipes for an intermittent supply is illustrated in Fig. 1; the main supply is shown as a solid line and the supply from the tank as a double line. It will be noted that the main supply pipe is fitted with an emptying cock; this should always be done and it should be at the lowest point of the pipe. In houses where the supply is obtained from a well or surface storage tank, the water should be carried direct to the upper tank, arrangements being made for emptying the tank at the lowest level of the internal piping. For bungalows in cases where the supply is obtained from rainwater from the roof a convenient plan is to support a tank as high as possible close under the eaves. The support can be arranged as a cool store for food.

Storage tanks should be provided with a cover and must be periodically and frequently cleaned. Supply pipes should be accessible and not bedded in plaster, and internal pipes must be inclined towards the lowest point.

Water Softening Apparatus. The question of the hardness and softness of water for household purposes is important, and in some districts it is essential that artificial aid be used to render the water soft. The term hard is applied to water which has absorbed mineral compounds from the ground, generally some chemical compound of lime or magnesia.

Water softening plants may be obtained in sizes suitable for any household, and a type of plant in general use for this purpose is the Permutit softener, illustrated in Fig. 2. The water is softened by a chemical compound through which it is made to pass. The cylinder shown in the photograph contains the compound, the upper tank containing a common salt solution which is regulated automatically and regenerates the permutit. If a quantity of dry salt is added at stated intervals the apparatus requires no further attention.

There are a number of reliable apparatus on the market functioning in somewhat the same manner. Sometimes there are considerations which prevent the installation of a plant for dealing with the entire water supply for the household, in which case it is possible to obtain small supplies of soft water for drinking, toilet, or culinary purposes by using

a portable apparatus connected at will to a kitchen, lavatory basin, or bath tap. Fig. 3 illustrates a typical softener of the smaller type. No plumbing is necessary, the appliance being simply fastened to the wall and the flexible connexion slipped over the nozzle of the tap.

Advantages of Soft Water. While some people claim that a certain degree of hardness makes drinking water more palatable, an excess renders it harmful. Organic purity of water may be attested, and yet inorganic purity may not be attained. The former refers to freedom from harmful bacteria, the latter indicates the absence of chemical compounds which make water hard, as for example, salts of lime and magnesia.

Most housewives know the deposit of "fur" or "scale" which forms on the kettle where water is hard, and can have some idea of the effects of this on the interiors of hot water pipes and boilers. Hard water has been replaced for various household purposes by rain water and distilled water in the past, but the first of these is uncertain in supply and not always possible to obtain and the second is costly.

As soft water effects many economies in the household, the installation of a softening plant is worth consideration, especially as some reliable and effective water softeners are obtainable at very moderate prices. They require no expenses of upkeep beyond the passing of a solution of ordinary salt in water through the appliance at stated intervals, take up little room and are noiseless.

The use of soft water in the kitchen produces immediate benefit and saving both of labour and money. Tea and coffee can be reduced in quantity, as the full value is extracted by soft water. The latter is necessary when cooking vegetables to preserve colour

and flavour. The consumption of soaps for toilet and domestic use is reduced almost by half, and soda or powders to soften water are unnecessary. For washing-up, the task is lessened when lime and magnesia have been removed and no chalky marks are left to polish off glass or silver ware. The insoluble curd of soap which makes laundry work difficult is obviated by soft water, in which a small quantity of flakes produce a copious lather.

WATER BED. In order to lessen friction and pressure and prevent bedsores in cases where from paralysis or other illness patients must lie in bed for long periods at a stretch a water bed is often employed in place of a mattress. It is simply an india-rubber bag of the size of an ordinary mattress. A screw stopper is inserted in one corner of the mattress through which it is filled.

The patient should not be on the bed while it is filled and should be taken off before it is emptied. The water for filling should be at a temperature of 90° and sufficient should be used to separate properly the two surfaces when the patient is on it. On the other hand, it must not be too full or it will be uncomfortable. A water bed should be covered by a mackintosh sheet, and a blanket beneath the sheet. See Bed-making; Bed Sore.

WATER BISCUIT. These plain biscuits are made by rubbing 3 oz. butter or margarine into 1 lb. flour, and adding sufficient water to mix the whole to a stiff dough. Knead the latter well, roll it out very thinly, and stamp it into biscuits. Prick each biscuit on top, and bake until they are pale brown in colour.

WATER BOTTLE. Glass bottles for holding water are ordinary household items. But old ones, some of them made before the invention or at least the general use of glass, are regarded as curios and are prized accordingly. Some of these are made of skin, others are of metal, in some instances the precious metals being used for them, and examples may be seen in the various museums.

In the ordinary household, the most usual type of water bottle is the one which is placed on a washstand. These bottles are bought complete with one or two tumblers, and vary from plain to cut glass or crystal.

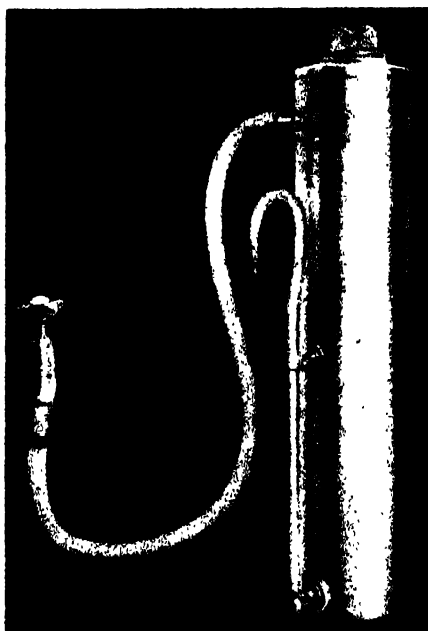
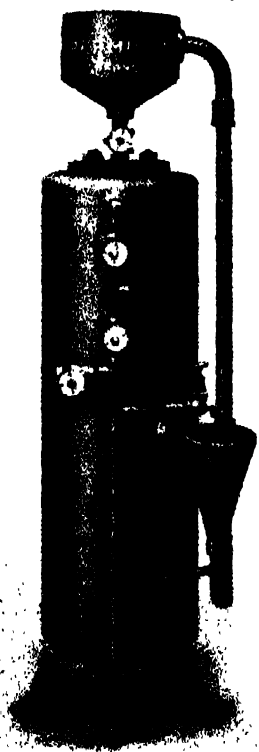
A flat shaped water bottle of glass or aluminium, for carrying when out for a long walk, can be obtained in a case fitted with a long strap. See Hot Water Bottle.

WATERBRASH. The regurgitation of a watery acid or acid material into the mouth from the stomach is a feature of some forms of indigestion, and is popularly known as water-brash. It is usually accompanied by a hot sensation behind the breast-bone and in the throat, which is described as heartburn (q.v.). See Indigestion.

WATER CLOSET. Both the construction and the arrangement of water closets are governed by building acts and the regulations of the local sanitary authorities, and when any alteration or addition is contemplated such requirements must be observed.

The usual apparatus comprises a closet pan and a flushing device known as a waste-water preventer. This consists of a tank or cistern holding two or three gallons of water. When the water is released, it is forced down a vertical pipe and flushes out the pan. The amount of water in the cistern is regulated by a ball cock, which is generally made of thin copper and should be airtight, so that the ball floats on the surface of the water. Its function is automatically to raise a lever, which closes a valve and cuts off the supply of water to the cistern when it has reached a certain level.

Should this ball be punctured, it becomes partly filled with water and is no longer



Water. Fig. 2. Permutit water softening plant which softens water by means of a chemical compound. Fig. 3. Portable softener suitable for a moderate-sized house.

Fig. 2. Courtesy of United Water Softeners, Ltd.
Fig. 3. Efficient Water Softeners, Ltd.

sufficiently buoyant to close the valve with the result that the water continues to run into the cistern and escapes by the overflow pipe. The remedy is to turn off the water at the source of supply, or else temporarily to fasten up the valve and then remove the ball and lever. The water is expelled by enlarging the puncture and by warming the ball, then the surface is scraped clean and a small patch of thin copper soldered over the aperture.

If the ball is immersed in water, air bubbles will show at once if there is another leak which can be remedied in a similar manner. If no air bubbles are visible, the ball may be considered watertight and can be replaced. Another cause of the cistern overflowing may be found in the lever gradually bending and not rising sufficiently. This is remedied by bending the lever to its proper shape with the aid of pliers and spanners. When the valve is the cause of the trouble, the remedy is to replace the worn washer with a new one.

The cleansing of a water closet should be carried out regularly, using a long-handled, stiff-bristled brush and one of the branded preparations or disinfectants which are put up for that purpose, failing which a few drops of hydrochloric acid may be dropped into the pan, which should be thoroughly flushed two or three times in succession. See Bull Cock; Drains; Pipe; Sanitation.

WATER COLOUR. Damp is the worst enemy of water colour drawings, because its presence is often unsuspected before the damage has been done. Common effects of damp are the crinkling up of the drawing and the appearance of milky spots on its surface. Initial care in seeing that the drawing is properly set in its mount—the slightly sunk variety is preferable—helps to prevent crinkling, but where doubt exists as to the dryness of a particular wall the frame should be kept clear with strips of cork glued at or near its points of contact with the wall. Cork studs about $\frac{1}{4}$ in. thick make a perfect non-conductor of damp. Mildew is very difficult to remove without injuring the drawing, but, if its presence is detected at an early stage, light rubbing with breadcrumbs may prevent its development. See Picture; Print.

WATERCRESS. Watercress is a hardy perennial herb, and is a true nasturtium. It can be cultivated in gardens without a waterway so long as it is given a moist, shaded position. It will thrive in still water, but steps must be taken periodically to renew it, otherwise it may become foul.

Table Uses. Watercress is an adjunct to salad and is also useful for sandwiches to be served for afternoon tea, or may be eaten with bread and butter at breakfast. It has medicinal qualities as a blood purifier. The cress must be very thoroughly cleansed and picked before being served at table, and the thick stalks removed. When added to

salads it is divided into sprays, but the leaves are always allowed to remain whole.

Many dishes are garnished with watercress, notably those which are egg and crumbed and fried. As a garnish for duck, chickens, pigeons, or game it is, after washing and picking, heated over steam or in a cool oven and seasoned with pepper and salt.

WATER GARDEN. The simplest form of water garden is a small pool of which the sides and bottom have been made watertight with layers of cement. On clay land the pool may be rendered watertight by puddling, but it is safer to use cement.

Water lilies, set in shallow baskets filled with loamy soil and planted in April or May are the best plants for a garden pool. There are many varieties suitable for deep or shallow water. Other attractive aquatic plants are the bog bean, Cape pondweed, and flowering rush (*hottonia*).

Those who possess some kind of waterway, be it shallow water, ditch, stream, or even bogland, can transform it into a charming adjunct of the garden proper. The mud of the water-edge will accommodate bold groups of Japanese irises in company with *Spirea palmata*. Then one may select the marsh marigold in single and double forms, together with the vivid orange globe flowers. Space may also be found for the sweet flag, funkia, and Japanese primulas. The reed mace will find a home, but its growth must be kept under control. Where space is ample gunneras, rodgersias and giant reeds are available for use. See Arrowhead.

WATERGLASS: For Eggs. As used for preserving eggs, this is a strong solution of silicate of soda and water, varying in specific gravity according to the amount of silicate that is dissolved. The strongest solution usually found has a specific gravity of 1.7, and contains about equal parts by weight of sodium silicate and water.

In preparing the waterglass for use, five or 10 times its bulk of clean boiling water should be added to the concentrated solution, the amount varying with its strength. The preparation should be quite cold before it is used. Experiments have shown that a 3 per cent solution, i.e. 3 parts by measure of the concentrated solution to 97 parts of water, yields as good results as the one of 10 per cent that is often recommended. A 5 per cent solution can be used with safety.

When the waterglass is added to the water, the two must be very carefully and thoroughly mixed. The eggs may be dipped in the waterglass and dried off, leaving a film on the shells and then stored upon shelves, or they may be kept in the liquid until wanted. The latter method is preferable. When taken out of the solution they should be washed. See Egg.

WATER JUG. Water jugs were made in the 18th century, and some of these are beautiful specimens of cut glass. Others were of pottery or china, made in plain, fancy and sometimes grotesque shapes. Most of those in use to-day are based on 18th century patterns, or else are of coloured glass, modern in form, and sold to match sets of tumblers. See Glass Ware.

WATER LILY. The *Nymphaea* or water lily makes a charming display in the summer months in a garden pool or even in tubs sunk in the ground. It must be planted in still water open to the sunshine. Running water is too cold and it does not flourish in the shade. The larger kinds need 2 to 3 ft. depth of water but the smaller kinds flourish in a pool 18 in. deep, and the miniature water lilies are happy in 12 in. depth of water. The way to plant them is to place the roots in a basket filled with loamy (turfy) soil and manure, weight them with stones, and sink them to the bottom of the pool in April or May. The

baskets will gradually decay. The smallest of all water lilies suitable for tubs or for a shallow pool are *pygmaea*, white; *pygmaea helvola*, yellow; *odorata alba*, white; and *Luciana*, rose.

One of the loveliest of the water lilies suitable for cultivation in a tank or large tub in a heated glasshouse is the blue *Nymphaea stellata*. If this water lily is started into growth under glass in a tub of water it may be placed out of doors for the summer months. See Lily; Victoria Water Lily.

WATER MELON. The water melon which is one of the two chief varieties of melon the other being known as the musk melon, is a popular dessert fruit and is also sometimes served as hors d'oeuvres. Several different kinds are grown, three of the best being known as the Spanish, apple-seeded, and the citron water melon. See Cantaloup; Melon.

Water on the Brain. See Hydrocephalus.

WATERPROOF. The name waterproof is given to mackintoshes and any other coats which have been so treated in manufacture as to be impervious to wet. Oilskins and cloth raincoats are in this category, and coats made of material that will not in itself withstand the rain are often lined with rubber. All such garments should have ventilation holes.

WATERPROOFING. Rubber is the most reliable substance for rendering fabrics impervious to water. There are other commercial processes which are used in the manufacture of rainproof cloths, and they depend mainly on the reaction between two or more substances which causes a substance insoluble in water to be deposited in the fibres of the material.

The process of treating calico and other thin materials with both raw and boiled linseed oil forms another method of waterproofing. It can be carried out by the amateur. The oil should be brushed very sparingly and dried in a current of air. If the material can be placed out of doors in a position free from dust, it will dry quicker. But the best method is to place it in a room near an open window, which should be covered with fine muslin. Three or four thin coats of oil will be necessary. Raw linseed oil makes the material more flexible, but it takes much longer to dry. A little gold size is sometimes added to the oil, in the proportions of 1 oz. to 16 oz. of oil, to assist the drying. If it is desired to make the material black, the method is to thin some black paint with turps and apply it when the last coat of oil is dry.

Coarse canvas for use as awnings, covers, and tents can be waterproofed by applying a solution made by mixing 1 part of sulphate of zinc and $1\frac{1}{2}$ parts of sulphate of iron with 18 parts of linseed oil and boiling it for two hours. When cool, add 15 parts of oil of turpentine and any colouring matter desired. The canvas should be left to dry for a week and a second application will complete the process.

Methods of rendering brick work and concrete resistant to damp and the action of driving rain or falling water are described in the article on Damp.

WATER RATE. This describes the charge made for the use of water by the municipalities and public companies that provide it. It is payable by all householders to whose premises the water is laid on, and is calculated at 5 or some other percentage on the rateable value, the amount being fixed by Act of Parliament. It is usually payable every quarter, but in London every half year, and landlords who themselves pay the rates on the houses they let pay also the water rate.

Water companies make an extra charge to persons who require water for other than strictly household purposes, e.g. those who have a garden hose or a garage or stables. If the water rate is not paid when it becomes due, the supply may be cut off and the occupier of the premises summoned. See Rates.



Water Lily. Soft pink flower of the variety *Colosseum*, which blooms throughout the summer.
Courtesy of Amateur Gardening

WATT. In electricity a watt is the unit of electrical power. It is the power exerted by a current of one ampere flowing under a pressure of one volt. A horse power is 746 watts. See Electric Light.

WATTEAU STYLE. Paintings or decorative designs imitated from the work of Antoine Watteau a French artist of the early 18th century, are said to be in the Watteau style.

Graceful fantasies of figures, in the court or pierrot costume of the period, set in a landscape of park or garden, the subjects are sentimental comedy or romance, the colouring is delicate and the figures dainty, but at the same time realistic and beautifully drawn. Statues of nymphs, musical instruments, and garlands appear in many of the compositions.

The style is used in mural and ceiling decorations for rooms to be furnished in imitation of this period. The ornamentation is often arranged in medallions connected by garlands. Designs for tapestry to upholster the gilt furniture of his time, for paintings on screens, on cabinet panels, on china and on fans are also often in so-called Watteau style.

Watteau style in dress usually refers to the *sacque* or overdress in which he painted so many of his court ladies, and particularly to the pleated fold at the back of the neck which flutes out into the skirt and is known as the Watteau pleat. See Fan.

WATTLE. Twigs or reeds daubed with clay or covered with tarts and used for building huts by some primitive peoples, e.g. by aborigines of Australia. In Australia a species of acacia is called wattle, and Wattle Day (Jan. 26) commemorates the founding of Sydney N.S.W. Wattle is also a type of garden fencing.

WAVELENGTH: In Wireless. The measurement of the wave produced in the ether by a wireless transmitting station. The ether is presumed to be a substance which permeates the whole of space, soaking through the interstices of the atoms of all gases, liquids and solids, in the same way that water soaks through a sponge. Therefore, ether waves are independent of the atmosphere and can travel equally well through a vacuum. Their form is similar to that of sea waves in so far as they possess crests and troughs. The distance between the crests of two successive waves is the wavelength. The measurement is normally given in metres. The number of waves which are produced by a transmitting station in one second denotes the frequency of that transmission.

The velocity of an ether wave (its speed of travel) always remains constant at 300 million metres per second. Therefore, if this velocity is divided by the wavelength in metres of a transmission the result is the frequency of that transmission. The unit of frequency is the cycle. A kilocycle is one thousand cycles and a megacycle is one million cycles. Usually the transmissions of medium and long wave broadcasting stations are listed in wavelengths and the short-wave and ultra short-wave stations in frequencies.

WAX FLOWER. This is the popular name of an evergreen plant of slender climbing growth, with wax-like flowers, suitable only for cultivation under glass. The commonest kind is *Hoya carnosa*, which needs a minimum temperature of about 55 degrees and bears white flowers tinged with pink. It should be planted in a tub, well drained, and filled with a compost of loam, peat and sand. Propagation is by cuttings inserted in sandy soil beneath a propagating case in spring.

WEAK MIXTURE: In Motoring. This fault in carburation may be due to the jets being too small or the choke tube too large. At one time it was thought that a uniform mixture was necessary at all engine speeds; but it has now been ascertained that a some-

what richer mixture is best for running at high engine speeds with the throttle wide open. A weak mixture contains about 17 parts of air to 1 of fuel.

The following rough tests will assist in determining the condition of the mixture. First shut off the fuel supply to the carburettor float chamber, then open the throttle wide enough to cut out the slow running jet. Fix the throttle so that the engine runs at a fair speed, but do not race it. If the engine speed increases as the fuel in the float chamber is consumed, the mixture is too rich. If speed is unaffected, turn on the fuel and flood the jet while the engine is running on the same throttle setting. If engine speed increases, the mixture is too weak. See Carburettor, Motor Car; etc.

WEANING. An infant at the breast should be weaned gradually when it is nine months old. A meal of cornflour, arrowroot, barley jelly or something similar, with cow's milk, is substituted for a breast feed, and in the course of a few weeks the child should have all its meals of the latter description. Should the time for weaning fall in hot weather, or when the child's health is disturbed by teething or some other cause, weaning should be post-

poned till the circumstances are more favourable. See Baby.

WEATHERBOARD. The particular class of timber known as weatherboard is used extensively in the construction of small buildings. It is commonly made with a feather edge and is wedge shaped in section, being 1 in. thick on one side and $\frac{1}{2}$ in. on the other, averaging in width 5 to 6 in.

The boards are weather-tight in virtue of their characteristic overlap: the lower edge of one plank overlapping by about an inch the upper edge of the plank beneath it.

It would be undesirable to expose the end grain of the weatherboard to the full force of the weather and for this reason vertical timbers, or cover strips, should be employed at all external angles. These strips are erected first and the weatherboard fitted into the space between them when the timber is of sufficient length to reach from one side of the wall to the other side.

In addition to the ordinary form it is possible to get rebated weatherboard, the use of which permits of a flat surface on the inside. For good work T. and G. matched weatherboard should be used. See Board, Draught House.

WEAVING IN THE HOME

With Descriptions of Various Kinds of Loom

This article deals with a domestic industry that is becoming increasingly popular. After a clear description of a typical loom and its mechanism the reader is told how to weave a piece of material suitable for covering chairs, settee, etc. The article loom may also be profitably consulted.

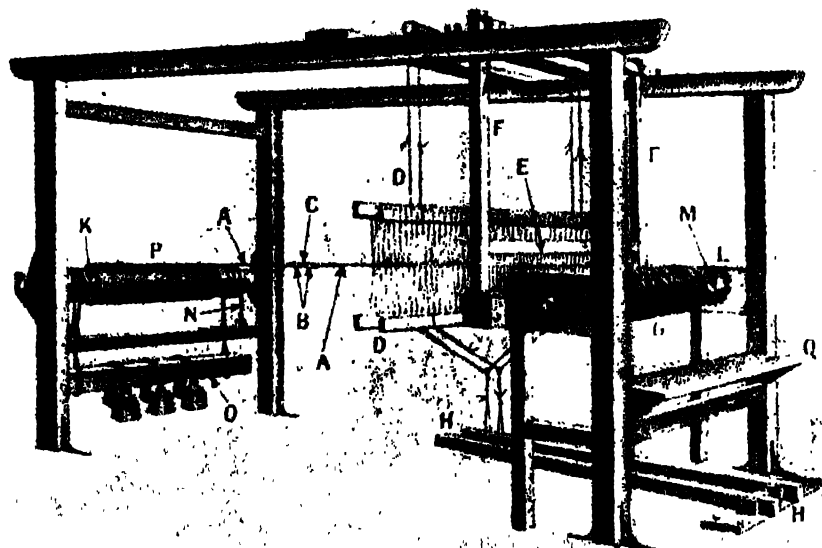
It is not necessary to provide a large loom in order to gain some practical experience of weaving in its simplest form—narrow materials, bands, trimmings, and ties can be made on a board loom of quite simple construction, as illustrated in page 733 of this Encyclopedia. The material produced is weaving in its simplest form, depending on colour for its effect, but it thoroughly illustrates the essentials of the craft. The proportions of this simple appliance can be increased, but for anything but the simplest work the table loom shown in the same page is recommended. It is not expensive to purchase, and can be obtained in widths from 18 in. to 33 in., made either as a simple loom, as illustrated, or with four heddles, manipulated by cords.

In a pedal loom the heddles are operated by the feet, and four or more can readily be manipulated, the hands being left free for passing the shuttle and beating the weft.

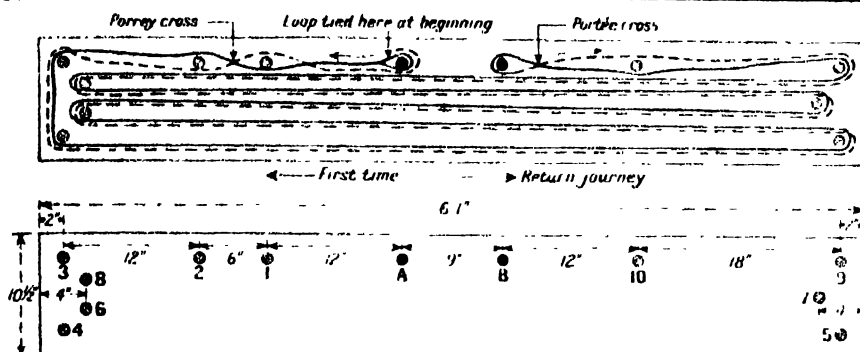
Greater speed is possible, and more intricate patterns can be undertaken.

In this page we illustrate a heavy loom of the conventional type, useful especially to the weaver who goes in thoroughly for the craft and can devote a room to the loom with its associated appliances. While the table loom will probably be preferred by the beginner on account of its compactness and ease of manipulation, there is a great deal to be said for the pedal loom, especially the simple type illustrated in page 731, for which we give working drawings and full constructional details.

In order to describe the basic principles of the craft, the setting up of a piece of weaving on the large loom will be described in detail. The first thing is to decide on both fibre and colour for the foundation, or what is called the warp of the weave, that is, the thread which forms the basis of the fabric, passing from roller to roller in the loom, as in Fig. 1.



Weaving. Fig. 1. Hand loom. A, warp stretching from roller to roller. B, lease rods. C, porrey cross. D, heddles. E, reed. F, shuttle. G, breast roller. H, treadles. K, grooves in roller. L, pawl and ratchet wheel. M, groove in roller. N, friction brake. O, weight beam. P, beam warp or cane roller. Q, weaver's seat.



Weaving. Figs. 2 (above) and 3. Showing a simple warping board, together with the necessary constructional dimensions. For further details see text.

Having selected the warp yarn, decide on the length of material to be made. In calculating the length, at least 18 in. or 2 ft. extra of warp thread must be allowed, as it is impossible to weave right up to the end of the threads. The desired width of the material must also be settled, and number of warp threads to the inch ascertained. A very good warp for a beginner is thick cotton. This can be used at twenty ends or threads to the inch and is recommended because its strength and durability render it less liable to break.

Laying a Plain Warp. The chief thing to bear in mind in making a warp is that all the warp threads must be of equal length. A simple method of getting a series of cords the same length is by using a board hung on the wall in the manner in Fig. 2. A dimensioned drawing of the warping board is given in Fig. 3. The pegs (A, B) shown in solid black, are loose and may be withdrawn from the board, the other pegs being firmly fixed. With the warp thread reeled or spooled, and resting on a thick wire supported on a frame (Fig. 7), so that the reel or spool will rotate, begin by looping the end of the warp to the peg of the warping board marked A.

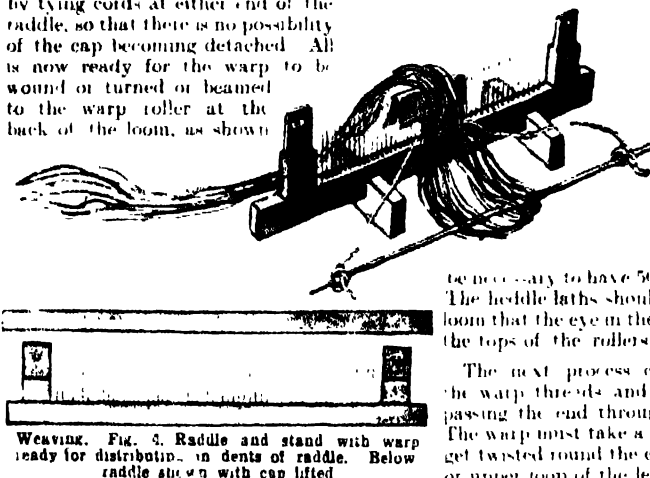
Proceed in the direction marked by the arrow to the left under the first peg, over the second, over the corner pegs 3, 4 and 5, then round 6 and back to 7; thence to 8 and round 9, under 10. Next the thread goes over and round B, over 10, thence to 9, and so back to peg 3, passing over 8, 7, 6, 5 and 4 in turn. From 3 the thread is continued under 2, over 1, and under A. This must be repeated until the number of threads on the pegs A and B corresponds with those required for the width of the material. Each forward and each backward run of the thread equals one warp thread. A complete course from A to B and back again to A equaling two warp threads. Both ends of the warp A to B must now be secured with cords, tightly fastened. Similar cords must be tied at the porrey cross, between 2 and 1, and the portée cross, between B and 10, but in these two instances the cords must be long, tied tightly at the ends, and looped near to the cross. These instructions apply to a plain warp. Instructions for laying a striped warp are given in a later section dealing with the weaving of an upholstery material.

The required number of threads having been made, take off warp at peg B and loop warp as if making a crochet chain (Fig. 9) until peg A is reached. Insert a smooth stick or iron rod $\frac{1}{2}$ in. or $\frac{3}{4}$ in. diameter through loop.

Beaming the Warp. The raddle is illustrated in Fig. 4, and is a simple framework of wood. The cap, or upper part of the frame, lifts off, displaying a series of strong wires fixed into the lower part of frame, in this case spaced five to the inch. It is between these wires or dents that the warp threads are now to be distributed. The suggested warp had twenty threads to the inch, so in order to spread the threads evenly across the loom it will be neces-

sary to put four warp ends together in a space or dent of the raddle. On some looms (e.g. the one shown in Fig. 4, page 734) the raddle can be inserted temporarily in the frame of the batten in place of the reed.

Having spread the warp, return the cap to its place, seeing that all the wires are settled in the groove of the cap. Then make it secure by tying cords at either end of the raddle, so that there is no possibility of the cap becoming detached. All is now ready for the warp to be wound or turned or beamed to the warp roller at the back of the loom, as shown



Weaving. Fig. 4. Raddle and stand with warp ready for distribution, in dents of raddle. Below raddle shown with cap lifted.

in Fig. 1, and it is important to spread the warp as evenly as possible on the warp or cane roller. This can be done by first lifting the non rod over which the warp is spread and placing it in the groove of the back roller where it is secured with cords. The triangle (Fig. 5) is heavily weighted and placed as far away as possible from the loom keeping the point to the middle of the loom. Next proceed carefully to turn the warp on to the roller.

This is accomplished by means of the turning stick, which is passed through a hole in the end of the roller. Turn the roller until all but a foot or two are on, or until the cross in the warp is at A on the warping board has been nearly reached. Two round, smooth sticks about $\frac{1}{2}$ in. or $\frac{3}{4}$ in. in diameter will now be wanted. These are the lease rods, and take the place of the loop of cord between 1 and 2 in the warp called the porrey cross. They will require some support and can be looped up with two cords attached to back and front rollers of loom, as at Fig. 1 B. To prevent confusion, tie the warps in groups with a loop.

Making the Heddles. The heddles, which carry the warp, are composed of groups of leashes set on shafts or frames of wood. Each eye in the leash has a warp thread passed

through it, and the action of treadling causes the warp threads to rise or fall making a space between the warps which is technically known as the rising or lowering shed. These leashes can be purchased or may be made on a small board formed as shown in Fig. 8. It is made of a piece of $\frac{1}{2}$ in. board having four pieces of dowel stick fixed firmly in it as shown in the illustration.

Cut a number of cords of the correct length. Measure one by hooking around first peg and taking the double cord down to the pointed end of heddle board, where it can be cut. This gives the length of cord required. Test one leash to make sure.

In order to make the process clear we may call the pegs A, B, C and D, commencing with the left hand one. Begin with a piece of cord by looping it round A and tying off firmly at B, leaving both ends the same length. Then, without cutting, loop round C and tie again, finally tie around D and leave the ends uncut. Simple reef knots should be made, and below B and C the cord can be twisted. Fig. 4 shows very clearly how the loops are made. The loop around C is the 'eye' of the leash.

Having made sufficient leashes, one for each warp thread, hang them on two thin laths of wood, suspended by cords, and the heddle is ready to hang in its place in the loom, as at Fig. 1 D. Two sets of these will be required, that is to say if 100 ends of warp have been warped up, it will

be necessary to have 50 leashes on each heddle. The heddle laths should be so arranged in the loom that the eye in the leash is on a level with the tops of the rollers.

The next process consists in picking up the warp threads and entering each, that is, passing the end through an eye of the leash. The warp must take a straight course, and not get twisted round the eye or through the lower or upper loop of the leash. First a back leash is entered, then a front, and so on alternately across the loom, the work being done from left to right.

The batten or sleigh, Fig. 1, F, contains the comb or reed, E. This is made with steel wire, which furnishes spaces of various sizes according to the requirements of the particular work in hand. Some have ten spaces or dents to the inch, some twelve or twenty. For ordinary work a ten or twenty reed will be found very useful. We will assume that a twenty gauge reed is being employed in the work now being described. In arranging the work, as stated above, twenty warp ends were allowed to every inch, so that one warp thread will be entered or passed through each dent or space in the reed, in the case of ten warp ends to the inch, every other dent would have been left empty, or in the case of forty warp ends to the inch, two threads would be entered together in each dent or space. Although a reed can be made with almost any number of dents, coarse or fine work can be done in a twenty reed. For very coarse work, such as thick canvas or rugs, ten or even five dents to the inch would be considerably more suitable.

To prevent confusion at this stage in gaiting or entering the loom, loop the warps.

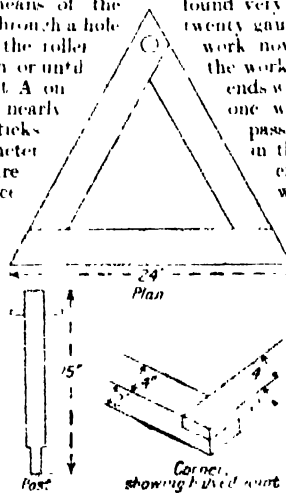


Fig. 5. The triangle together with diagram showing measurements and method of construction.

up to the entire width of the warp. It is best to thread an inch at a time and tie up separately, also to have instruction paper in front of the worker so as to check stripes in warp.

Fasten loom firmly or to a table so that it can resist the pull of the warp in beaming on. Place triangle, heavily weighted, on the floor a far away as possible keeping point of triangle to the middle of loom. It is very important to see that eyelets are closed in one line before warping up. Do not take out crossing sticks. Undo chain as far as triangle. Next take first bunch of threads and pull up tight (leaving no loose ones), and tie on stick at back roller, half under and half over. The stick passes through a number of loops at back of loom. It is best to tie one inch at each end and one in the middle, and continue until all bunches are tied at an even tension.

Take crossing stick down through the warp to the back, making sure that there are no loose threads or ends. The end of the warp chain is looped over the post of triangle and secured by the peg. This keeps the unbeamed portion of the warp taut and even while winding on is in progress. Place a sheet of paper over the layer of bunches on back roller and turn roller, so winding on the warp, until triangles pulled up to loom. Now take triangle down again away from loom and proceed in a similar manner until warp is finished. It must be noted that each time the triangle is pulled up close to the loom by the winding on and consequent shortening of the chain of warp, a number of loops of warp chain are to be freed, and the chain counted again. When warp is finished, cut through ties B, take out crossing sticks, open harness and tie on to front stick in the same manner as at the back of loom, but putting the "unders" under the stick, and tie to tops. Continue until finished when the loom is ready for weaving.

The Weaving. Blue-spin silk is used for the weft, but a linen could be utilized, and would make a stronger fabric. Place a spool in shuttle, clump loom on a table about 20 in. high so that a comfortable sitting position is obtained (see illustration on page 733). Turn the handle at side of loom, which will operate the heddle roller and cause one set of heddles to fall and one to rise, thus forming a "shed" or opening of the threads. Throw the shuttle through "shed" from right to left, catch the shuttle on the left side, bring batten forward as far as it will come. Hold the batten in the centre with the left hand, at the same time turning the handle in the opposite direction to that first used. Push batten back, throw shuttle through shed from left to right, catch the shuttle with the right hand, and pull the batten forward to beat as before. Now change the shed by turning the handle opposite way.

Continue weaving until there is insufficient opening to pass shuttle through, when the batten can be set further back by lifting up and moving over one or two notches, so that a good opening is obtained again. Continue weaving further until shed becomes too small for shuttle, when some of the woven material must be wound on to roller. Release the back roller, wind the material round the front roller, placing a sheet of paper between layers to keep the material clean and even. It is important to leave sufficient of the material unwound for



Weaving. Fig. 11. Hand woven material for chair cover (part width only shown). Border is repeated at right margin, with brown stripes on a lawn ground between.

2 oz., blue, 2 oz. Blue-spin silk is suggested for the weft, and 1½ oz. per yard will be needed. The colour could be varied to give a check effect, if desired. Linen might be used for the weft, instead of silk, if a stronger and more durable fabric is required. The piece of cloth from which our illustration was made was woven for the purpose by the Aston Weaving Studios, from whom

the batten to press up firmly when beating the weft between each pass. It is necessary to keep the edges of the warp thread and woven material even when winding up, and also to maintain an equal tension all through the piece. After winding on the woven material as described, lift the batten nearest to the front in the first notch and continue weaving again. This sequence of operations is carried out at intervals until the entire warp is finished.

The quantities of linen needed for the warp in the various colours are as follows: Brown, 8 oz. Linen, 2 lb. 8 oz.; orange, 4 oz.; yellow, 2 oz.; green, 2 oz.; navy, 2 oz. Blue-spin silk is suggested for the weft, and 1½ oz. per yard will be needed. The colour could be varied to give a check effect, if desired. Linen might be used for the weft, instead of silk, if a stronger and more durable fabric is required. The piece of cloth from which our illustration was made was woven for the purpose by the Aston Weaving Studios, from whom

suitable yarns may be obtained. The material would also make curtains, table runners, and cushions. By using three complete widths it might be employed for a bed spread, the widths could be joined either by a handwoven braid or trimming of narrow width, by a knitted insertion (see page 618) in silk to tone, or by faggoting (q.v.). Handwoven materials for upholstery and furnishing require little trimming as their decorative value lies in colour and texture. Heavy tassels, plain cords, narrow silk fringes, gimps and tinsel gimps are suitable finishes for cushions, curtains and runners.

WEBBING In Upholstery. In upholstery, webbing in the form of a wide tape is used for supporting the stuffing and springs of chairs. There are two kinds, the best being English, which is recognized by its black and white diagonal pattern. Its strength is known by numbers. Nos. 10, 12, and 14 being in general use. English web is put up in pieces of 18 yd. A cheaper quality is woven in stripes, and the sizes are known by the number of stripes of colour in the width. It is usually put up in pieces of 36 yd.

Although webbing is a closely woven material, it stretches in use, and when it is attached to a chair trunk it is necessary to stretch it as much as possible. The upholsterer uses special pliers for this purpose (illustrated in use on page 1336), but it is generally possible to use a short length of wood as a lever.

WEDDING ARRANGEMENTS AND ETIQUETTE

How to Plan the Reception and the Refreshments

Wedding invitations should be sent from three weeks to a fortnight before the wedding day. They are sent out in the names of the bride's parents or next relative, by either of whom a luncheon or reception is usually given after the ceremony. In the case of a young widow living with her parents, the invitations would be sent out in their names, but if she is living in her own home, her own name is announced, and in that case an invitation should be sent to anyone who has given a present, even if there is little chance that he or she will be able to attend the ceremony. Presents are always on a table at the reception, and a special afternoon tea is sometimes given, also for this purpose, previous to the wedding day. They should be attractively arranged, and a card bearing the name of the giver placed on or close to each present.

Wedding Expenses. The chief expenses of a wedding fall on the bride's parents, or relative who stands in their place. The cost of the trousseau, dinners, and at homes given to introduce the bridegroom to the bride's family, the reception, whether given at the house or at an hotel, are all defrayed by them. A choral service, the fees of the organist, choir-master and choir, also the printing of leaflets for the special hymns to be sung on the occasion, and the newspaper announcement of the wedding, all floral decorations, the hire of the awning and felt at the church doors, and wedding buttonholes are paid for by them. The bridegroom provides the ring, and bouquets for bride and bridesmaids, and it is usual for him to make a present to each of the bridesmaids. He also provides the car to take himself and the bride from the church to the reception or railway station for this afterwards. Should the bride's father have a car of his own,

it is sometimes lent for the latter purpose. The bridegroom also pays the fees connected with the ceremony. It is also customary for him to provide the furniture and accessories for the new home, though these are often supplemented by the wedding presents.

The Ceremony. Afternoon weddings are usually at 2.30 o'clock. Quainter weddings take place in the mornings, the hours when marriages can be solemnised being from 8 a.m. to 6 p.m. The best man, usually a bachelor, should either accompany the bridegroom to the church or meet him there. They both await the bride at the right-hand side of the chancel gates. The best man stands on the right of the bridegroom during the wedding ceremony, he should sign the register in the vestry afterwards and pay the fees if the bridegroom does not do so on arrival.

The bride is driven to church with either her father or mother. Should the father be dead, the bride is given away by a near male relative, who meets her at the church door. Should there be sisters who are acting as bridesmaids, the mother often precedes the bride to church and with the bridesmaids awaits her inside the doors. When the bride and her father arrive she takes his right arm while walking up to the chancel. At choral weddings the clergy and choir head the bridal procession to the chancel, singing a hymn. The bridesmaids follow the bride, and her mother walks next with a near male relative.

The relatives in either family seat themselves in pews, the bridegroom's relatives on the right-hand side of the nave, the bride's on the left. The bride stands at the bridegroom's left hand with the person who is to give her away on her left. The bridesmaids stand immediately behind the bride, and the chief bridesmaid holds her gloves, if she has these, and bouquet from the commencement of the service. After the service is over the bride takes the bridegroom's left arm, and, preceded

by the officiating clergyman, and followed by the chief bridesmaid, best man, father, mother and most distinguished guests present, they enter the vestry to sign the register. After this the bride takes the bridegroom's left arm and passes down the aisle, followed by the bridesmaids. The married couple should leave the church without shaking hands, etc. with friends, if a reception is to follow. The bride's mother should be the next to leave the church, in order that she may receive guests to the reception.

In the case of a widow, it is optional whether she is given away or not. She does not have bridesmaids, but may have pages, should the wedding be a fashionable one. She may have a wedding cake, but it should not be decorated with orange blossoms.

Wedding Reception. Wedding luncheons are usually given at receptions only when the party is comparatively a small one, and the wedding has been held in the morning, or at country weddings. The menu is that of a seasonable luncheon. It is usual to begin the actual meal about half an hour after the guests have assembled at the bride's house or wherever the reception is being held. Cocktail and appetizers are offered first and afterwards the luncheon is served. Wedding cake and champagne are included on the menu.

Plato for service, a wedding cake knife, and decorative accessories such as a bouquet holder, flower vases, and a wedding cake stand can generally be hired from a firm of caterers. Floral decorations are of first importance, and should tone with the colour scheme of the bridesmaids' dresses, or may be of all white flowers. China, glass, and silver ware and also the embroidered or lace runner or lace trimmed cloth on the buffet or dining table should all be chosen with regard to the occasion. If white flowers are used, amber or green glasses will look well. A background of palms, ferns, flowering plants and arrangements of cut flowers to tone with the other floral decorations is usually made in one part of the reception-room where the bridal pair will stand to receive congratulations before luncheon is served in the dining room, or the cake is cut and light refreshments provided.

When only a reception is given at an afternoon wedding, such refreshments are much the same as those at an At Home or supper party, with the exception of the wedding cake and champagne. Orangeade or lemonade should be provided for guests who do not drink wine. Whatever the nature of the entertainment the bride should put the knife into the cake, of which a wedge should have been previously cut and tied with a bow of satin ribbon to simplify the operation. While more cake is cut, either the chief bridesmaid or the hostess slices the wedge and the cake is handed round with champagne in glasses, so that the guests may drink the bride's health.

On the buffet all kinds of sandwiches, lobster patties, fancy pastries, small cakes, fruit, tea and coffee should be set out. Trifles, sundaes, and other ice creams may be also provided. About 4 sandwiches, 1 pastry, and several small cakes can be allowed for each person, while 1 bottle of champagne is usual for 4 persons and 1 quart ice-cream will be sufficient for 12 persons. The buffet should be placed so that those who are helping to serve refreshments can pass easily behind it and also have access to the kitchen for supplies. Where there is a service hatch, the buffet should be placed in front of this.

Wedding Cake. Bridal cakes are always rich both in their ingredients and decoration. Small silver bells and symbols of good luck are usually added, and occasionally a greeting is written across the top of the cake in icing of a contrasting shade. Many cake shops specialize in making them, but the following

is a good recipe for a home made wedding cake. Cream 1 lb. butter and $\frac{1}{2}$ lb. castor sugar till they are quite smooth; then add 6 eggs, one at a time, and beat thoroughly. Stir in 1 lb. flour, and gradually add 3 lb. currants, $\frac{1}{4}$ lb. sultanas, $\frac{1}{4}$ lb. finely cut mixed peel, $\frac{1}{4}$ lb. almonds blanched and chopped, $\frac{1}{2}$ oz. mixed spice a few drops of almond essence, $\frac{1}{2}$ gill rum and 1 tablespoonful dark treacle. Beat well all the time to mix the ingredients thoroughly, and then put the mixture into a well-greased cake ring surrounded outside with several thicknesses of brown paper. The cake underneath must be well protected also. Use a very thick baking sheet covered with sand under the tin on which the cake stands. Bake the cake for five or six hours in graduated heat and keep it for a month at least before icing. See page 173 for icing directions, and also the entries on Almond Paste and Icing.

To provide a cake of more imposing appearance increase the ingredients in the same proportions to four times the quantities given. Provide two tins, one about 10 in. and the other 6 in. in diameter, prepare them as already directed, and fill them with cake mixture, 3 parts full. Bake the smaller tin for about 4 and the larger for 5 hours on the sand-covered sheet. When cooked allow the cakes to cool and wrap them in white paper for storage in a tin. Ice the cakes when required with almond paste and then with royal icing. Place the smaller cake on the larger before decorating with fancy icing by means of a forcing bag (see page 477), or forcing pipe (see page 609), and completing the whole with the silver ornaments and satin ribbon. On the two ends of the bow the bride's initials can be worked on the left the bridegroom's on the right, and a spray of white heather passed through the knot.

Wedding Ring. In Great Britain the wedding ring is worn on the third finger of the left hand. For legal purposes the bride has the ring put on her finger by the bridegroom during the ceremony. A widow remarrying usually removes her first wedding ring when she is about to go to the church or register office.

WEDGWOOD: The Chinaware. While old Wedgwood pottery, especially in its more characteristic forms, is not easy to procure the Etruria factory, established in 1768-9 by Josiah Wedgwood, still produces as vigorously as ever, in some instances from the original moulds, wares which legitimately bear the Wedgwood name.

The term "old Wedgwood," may usually be taken to mean pieces produced before 1800. These productions are more perfect in finish

than those made during the 19th century, or even to day, though an excellent quality marks the present output of fine pieces.

The many wares which Josiah Wedgwood invented or improved include the fine cream-ware which achieved world-wide renown as Queen's ware, the famous jasper ware, black basalt or Egyptian black, several forms of variegated and pebble ware, besides fine red pottery and silver and gold lustre.

The dinner service made for Catherine II of Russia was in Queen's ware. Each of the 952 pieces was hand-painted with a different view of rural England. The black basalt ware, which was solidly black throughout and lent itself to fine incised or raised decoration owing to its beautiful texture, is another ware which has been extensively reproduced for flower bowls and vases.

The distinctive qualities of old Wedgwood are its perfect potting and its fastidious accuracy of detail, extending to the fitting of the lids and the shapes of the spouts. The applied decorations are always sharply defined, the edges being undercut and the whole polished on the wheel, resulting in an unmistakable velvety feel. Queen's ware and pearl ware set new standards of technical excellence which drove out of the market both salt-glaze and delft. The early tea and coffee sets in these styles, as well as in basalt and other clay fabrics, are highly prized.

Distinguishing Marks. During Josiah's lifetime the mark was impressed in the clay. At first the name Wedgwood appeared alone, but for twelve years after 1768 the partnership mark Wedgwood & Bentley was used on jasper and crystalline wares except blue jasper and also upon blue plaques and medallions on some of which portraits were carried out in relief with exquisite precision of detail. Etruria was added for a brief period after 1840, England being added to meet American requirements in 1891. In 1879 a device of a vase was placed above the name. A three-character mark, used since 1846, was definitely established in 1907, when the figure 3 denoted the third alphabetical cycle and J the letter for that year preceded by the workman's initial.

The name Wedgwood & Co. denotes the productions of Ralph Wedgwood, a cousin of Josiah, produced 1796-1890. Wedgwood was used deceptively by Smith, of Stockton, for some years, until stopped by a perpetual injunction granted in 1848. Apart from unscrupulous imitations, several pupils and rivals of Wedgwood have produced under their own marks styles of ware created by him which are also in demand by collectors.

Porcelain made for about ten years after



Wedgwood. Pieces from tea and dinner services of modern Queen's ware
Courtesy of Josiah Wedgwood & Sons, Ltd.

1805 is distinguished from that produced since 1878 by the plain name Wedgwood, stencilled usually in red over the glaze. In 1848 Etruria took up the manufacture of Parian ware; after 1850 jasper was made with the well-known lavender ground; in 1860 reproductions of Italian majolica were introduced, and some painted ware was done. See China, Jasper Ware; Lustre Ware; Pebble Ware; Pottery; Queen's Ware; Staffordshire Ware.

WEEDS: Their Treatment. Every gardener has to deal from time to time with

weeds of various kinds. They may be annual, biennial, or perennial, and must therefore be combated by different methods according to their habit of growth.

Hand pulling, digging with fork or spade and the total removal of the weeds are efficient methods of destruction. In every case the weeds collected should be burned. If these methods are too laborious, owing to the accumulation of weeds, spraying may be tried. Poppies, groundsel, dandelions, and certain other weeds can be more or less crippled and prevented from seeding by spraying them with 25 per cent solution of copper sulphate or a 15 per cent solution of sulphate of iron.

When hand weeding of lawns becomes essential it must be systematically carried out, and clearance should be made square yard by square yard, the labourer kneeling on a pad and spudding out every available weed. Where tap-rooted weeds, or others with large crowns, are rampant, a skewer dipped into a bottle of sulphuric acid will be found a simple eradicator; when using the acid a pair of leather gloves should be worn. To deal with weeds in beds and borders the hoe should be in constant use.

The weeding of paths should be taken in hand during early spring. Hand-picking for such purpose is an antiquated business, whilst the old remedy of applying salt or brine is only effectual up to a point, and sometimes actually encourages a fresh crop of weeds. Proprietary weed-killers, poisonous and non-poisonous, are far more effective, especially when applied on dry, windless, and sunless days. It must be understood, however, that such preparations are for use only on paths and walks, unless otherwise stated on the container. Preparations known as selective weed-killers are worth consideration; they are obtained at horticultural and agricultural stores.

Implements Used. Common implements for weeding, usually contained in the average gardener's equipment, are the hand-fork, Dutch hoe, rake, and spud. There are other articles for special purposes, including the daisy rake. A weed extractor has a fork to insert under the crown of a weed, and which, by pressure, lifts the root stock bodily from the soil. Some instruments are designed for the use of liquid weed-killer. Lawn sand is a preparation made to keep down weeds on lawns.

WEeping ROSE. A Rambler or climbing rose, when budded on a brier 5 ft. or more high, is called a weeping rose; such a specimen makes a handsome lawn tree. Weeping roses should be pruned as soon as the flowers have faded by cutting out parts of the old branches to make room for the new shoots. All brier shoots must be cut off; they may develop not only on the stem but among the branches. Each tree must be supported securely by a strong stake. Roses which make beautiful weeping standards are Albic Barbier, Fraicheur, Lady Godiva, Hiawatha, Purity, and Dorothy Perkins. See Rose.

WEEVIL. This is the popular name given to a large number of beetles that have the anterior part of the head prolonged into a beak. They feed upon plants and are injurious to grain. Three types that should be noted by the gardener are the clay-coloured, the black, and the plum weevil; they appear in late spring and early summer, attacking leaves, shoots, and bark, and causing much damage.

The clay-coloured, or raspberry, weevil is the most harmful of the three and is also the smallest. In habit it is mainly nocturnal, crawling out from its hiding place at night to feed. It damages fruit blossoms and buds and the tender shoots of raspberries.

The black, or vine, weevil is more troublesome under glass than in the open. In the beetle stages, it is chiefly injurious to vine shoots and to the shoots and foliage of fruit

trees or shrubs grown under glass. The larva is very injurious to plants in pots, notably to ferns, primulas, and cyclamens. It is not unusual to find six or eight grubs in one pot. The grub is injurious to many garden plants and also to strawberries. The red-legged, or the plum, weevil is a black, shining insect, $\frac{1}{2}$ in. long. It is very injurious to plums and also attacks peaches, nectarines, and apricots.

Those weevils are extremely difficult to eradicate once they have become established, and it is therefore of great importance to prevent them from obtaining a foothold. The weevils cannot fly, and can therefore only reach fresh ground by crawling or being carried in soil when in the grub stage.

In greenhouses devoted to growing ferns or primulas the first stock should be carefully watched, and if the plants do not thrive the roots of the least healthy should be searched for the white grubs. Potting soil should be examined, and if grub-infested soil has to be used it should first be sterilized by heat.

Young trees and grafted stock can be protected from the adult weevils by banding, since the weevils spend the day in the soil and only crawl up at night. Apart from this, the only treatment is to catch the weevils at night by shaking them on to tarred trays or boards. Vast numbers can be caught in this way, but care is necessary, as the insects fall off readily when alarmed. No insecticide has proved of any use against them. See Apple Blossom Gird Weevil, Grease Plum.

WEIGELA. The bush honeysuckle, called the weigela, is a beautiful, hardy leaf losing shrub 5 ft. or more high, which blooms in early summer and thrives in ordinary well-tilled land. The typical kind is rosea, with rose-coloured blooms. Improved varieties are Eva Rathke, crimson; Abel Carriere, rose crimson; Mont Blanc, white; and Van Houttei, rose and white. Propagation is by cuttings of young shoots under glass in May or by inserting woody cuttings out of doors in autumn and covering them with a handlight.

WEIGHT. The weight of an individual depends on the height, age, and sex. The ratio of weight to height varies considerably in healthy people. The average weight for a man and woman about 25 years of age, and of a height of 5 ft. and over, is as follows:

A 10 lb. must be added for every additional 10 years of age, more for a woman than for a man. If the weight of an individual is 1 $\frac{1}{2}$ or 2 st. below the average for his height, and more particularly if there is a progressive loss of weight, there is need for a thorough overhaul by a doctor.

WEIGHTS AND MEASURES. In English law all weights and measures are based upon the pound and the yard, which are the only independent standards. The gallon, which is the standard of all measures of capacity, is based upon the pound. It is defined as the volume of ten standard pounds of distilled water weighed in air against brass weights, both water and air at the temperature of 62° F with the barometer at 30 in.

Legal Points. Certain commodities have conditions about their sale. Coal must be sold

by weight for domestic use. Where the quantity exceeds 2 cwt., the seller must deliver to the purchaser a weight ticket showing the net weight of the coal delivered before any part is unloaded. The sale of coal in quantities not exceeding 2 cwt. is governed in most towns by the by-laws.

In selling any article of food by weight, measure or number it is an offence to deliver a less weight, measure or number than is purported to be sold. Tea, coffee beans, cocoa and potatoes must be sold by net weight. Certain other articles of food may be sold with the wrapper included, provided the weight of the wrapper does not exceed certain specified amounts. In the case of meat it is an offence to deliver to a purchaser any butcher's meat without a legible statement of weight upon which the purchase price is based, unless the delivery is made to the buyer on the premises of the seller immediately after the purchase has been made.

If the meat is boned or trimmed and such bones and trimmings are not delivered with the meat, the delivery note should then contain two statements of weight, (1) the weight on which the purchase price is based, i.e. before boning and trimming, (2) the net weight as sent out. All bread, excluding fancy bread, must be sold by net weight and, normally, must be made in weights of 1 lb. or an integral number of lb.

No milk may be sold in bottles or containers except in quantities of $\frac{1}{2}$ pint, or multiples of $\frac{1}{2}$ pint. This does not apply to dried or condensed milk. See Avordupois Weight; Bushel; Decimal System; Dry Measure; Gas; Liquid Measure; Measurement; Metre; Therm., etc.

WELDING. A simplified process of welding or joining ferrous metals consists in heating the parts to a white heat, placing them one upon the other, and hammering them into union. Autogenous welding has to a large extent taken the place of the older method, especially for small work. The apparatus consists of a blow pipe with oxygen and acetylene gas under high pressure. These gases are mixed within the blow pipe, and emerge at a high velocity from a small nozzle. Ordinary welding can be carried out by the amateur, but considerable practice is required. Success depends on the proper heating of the metal, the direction of the hammer blows, and often the use of a suitable flux placed between the joint faces to assist adhesion.

While the practice of welding is generally limited to the ferrous metals, it can be used with modifications and special fluxes for some others such as aluminium. Autogenous welding is particularly applicable to articles made of cast iron, which, by their nature, cannot be united by hammering. See Brazing; Flux; Metal Work; Soldering.

WELL: For Water Supply. In country districts the water well is vitally important, and it is necessary to give much attention to the subject when considering the purchase or renting of a country property.

There are several methods of ascertaining whether water is present beneath the surface. One is to employ a water diviner, who, with the aid of a hazel twig, is able to locate running water with considerable accuracy. A more scientific method is to use a regular water-divining instrument or to call in a geological expert.

Although the diviner is able to say that water is present, it is impossible to know whether it will be fit to drink until it is actually reached. Consequently, before incurring the expense of making a well, the surroundings should be carefully studied. If stables or cowsheds are in the vicinity and on land slightly higher than the site of the well,

there is risk that the water may be contaminated, and it is better to find another site.

When there is any choice in the matter, the most convenient site will be that which is highest in respect to the building to be supplied with water, and also nearest to it, at about the same level. In hilly districts there is often no need for pumping water, the spring being at a sufficient altitude above the house. Such ideal conditions, however, are seldom encountered in the more level parts of the country, and some means of mechanically raising the water from the well is necessary.

The plan commonly adopted is to employ the local well digger to dig the well and to brick it up on the inside. An alternative plan is to use well-boring tools, boring only a small hole, perhaps 4 to 6 in. in diameter, and sinking an iron pipe into the earth, but this is practically only when the pipe would terminate in a stratum yielding a sufficiently voluminous supply, or when an artesian well can be made. See Pump, Run, Water.

WELSH CAKE. This refers to a crumbly cake mixture made in a short crust, rolled out into a sheet, and then cut into rounds with a cutter or the lid of a tin. These rounds are baked on a lightly greased griddle.

Take 1 lb. flour, 1 egg, 100 pounds of baking powder, a pinch of salt, 1 oz. of fat and butter mixed, 1 oz. of sugar, 3 oz. of curd, and sufficient milk to mix all to a stiff dough. Sift the salt, baking powder, and flour together, rub in the fat, add the curd and curants, and moisten with the milk.

Roll out about 1 in. thick, cut out cakes, and bake on the griddle stone. Turn the cakes when browned on one side, and brown the other side. 1 or 2 eggs may be added if a superior cake is required, but less milk would be needed in that case. Sour milk or butter only improves these cakes. They are generally eaten hot for tea. See Griddle.



Welsh Corgi, a breed of dog used by shepherds in the uplands of Wales (Pembroke type)
Photo, Theo. Fall

WELSH CORGI. This dog is regarded as having two centres of origin, namely, Cardiganshire and Pembrokeshire. The difference between the two is that the former have long tails and the latter have short ones. Moreover, the Pembrokeshire variety are either red or red and white, whereas the Cardiganshire dogs are any colour excepting white, and are slightly heavier. The weight of the corgi is from 18 to 25 lb. The head is foxy and the ears erect or semi-erect. The contour of the body is also foxy, but the limbs are of sturdier build than those of the fox. The coat is smooth but harsh. Corgis make excellent workers for sheep, and are good tempered and hardy.

WELSH DRESSER. This name is given to a piece of furniture that was made in Wales, the reason presumably being the abundance there of oak. This type of dresser is made of that wood, frequently with a simple inlay of mahogany. It is polished dark, has plain rectangular mouldings, and also plain brass droppers for the drawers.

Pieces labelled by the name Welsh dresser are often spurious. A good test is the condi-

tion of the brass. If the piece is a genuine antique, time will have browned the handles, consequently, those that look new should be suspected, though of course new handles may have been added to an old piece. See Dresser.

WELSH OMELETTE. Wash three small leeks, freeing them from grit; trim off the root ends and most of the green portion, and then cook them in stock or water until they are tender. Drain them, cut them into thin slices, and mix with a little butter or margarine, and dust with pepper. Keep them hot while making a plain omelette, and put the leeks on one half and fold over. Sometimes a little grated cheese is added. See Leek, Omelette.

WELSH RAREBIT. A rich cheese, such as Cheshire or Cheddar is best when making a rarebit. Gloucester cheese is sometimes substituted for Cheddar. Cut up 4 or 5 oz. cheese in thin slices, and place them in a saucepan with 1 oz. butter or margarine, 1 small mustard-plant made mustard, 3 tablespoonsful draught mild ale, and seasoning of cayenne, pepper, and salt.

Stir the cheese over gentle heat until it is melted and the whole has the appearance of a creamy mixture, then dish it immediately on hot buttered toast. The toast should be freshly made and the crust cut off, if it should be crisp and evenly browned, but not hard. Rarebit requires speedy preparation, and it should be served immediately it is cooked. Malt vinegar can be added in stead of ale.

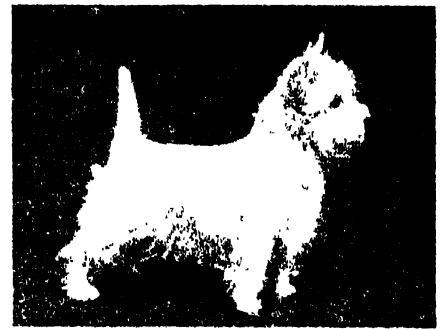
A second method consists in making into a pur 5 oz. cheese, adding 1 1/2 oz. butter or margarine, a good pinch pepper, salt, and a small quantity of dry mustard. Stir the mixture together and melt them in the oven, then serve on toast. Sometimes 2 tablespoonsful milk are added to this mixture before putting them in the oven.

WELSH TERRIER. Probably similar in origin to the wire-haired fox terrier, the Welsh terrier has the same sporting instincts and the desire to exterminate all four-footed vermin. But, even in the case of the fox terrier, this does not unfit him for human companionship, and he will be found to be a good house dog, of affectionate disposition, and not apt to quarrel with his own kind.

In many respects similar to the wire-haired terrier, his head is rather wider and the muzzle more powerful. He has a very close and abundant coat of hard, wire hair of black and tan, or grizzle and tan, without any black pencilling on the toes. The height at the shoulders should be about 15 in., and weight about 20 lb.; less in each case for the bitch. See Dog.

WEST HIGHLAND TERRIER.

This rather small but strongly built, hard-coated dog is often regarded as a white variety of the Scottish terrier, but it is a distinct and ancient breed, kept for routing the fox, otter, and badger from their lairs in rocky ground. To inimitable courage are added great intelligence and devotion to his owner. For the show bench he should be wholly white with the exception of his nose, his footpads and nails, which are



West Highland Terrier, a breed of small sporting dog which combines great courage with affection
Photo, Theo. Fall

black, yet he may be quite true to type even if he has a little red or yellow on his back or ears. He stands from 8 in. to 12 in. at the shoulder, and weighs not more than 18 lb., the bitch 2 lb. less. There is a soft, close, furry undercoat, impervious to wet. See Aberdeen Terrier.

WHAT-NOT. The term is used for a piece of furniture, something resembling a cabinet without doors, that was very frequently seen in English houses in the 17th century. It is made usually of slender pillars or uprights that support a number of shelves, suitable for displaying china. What-nots are made chiefly of walnut and mahogany, but the most decorative examples were of papier-mâché, painted black, painted in floral designs, and often inlaid with mother of pearl.

WHEAT. The cereal plant providing the principal food of mankind, is a member of the extensive grass family. The wheat plant has a hollow knotted stem, from 2 to 5 ft. high, according to variety, climate, soil, and other conditions. It bears a zigzag shaped ear, spiked, with a flattened spikelet growing out of each notch. Each spikelet usually bears four conspicuous flowers, succeeded by four young, grooved along one side. Ground grain flour is used chiefly for bread-making.

While growing on the plant, the kernel, or grains, are enclosed in a sheath-like covering called glume or chaff. The type known as common wheat (*Triticum vulgare*), is subdivided into soft, medium, and hard wheats according to their milling qualities and into red and white wheats, according to the colour of the grain.

More than a thousand varieties of wheat are known throughout the world, and the number increases through the activities of plant breeders and seed growers. Up to the end of the 18th century the wheat grown in the U.K. did not differ greatly from some of the types raised in ancient Egypt 4,000 years earlier. The first developments came early in the 19th century, and since then, as a result of scientific plant breeding, various stocks have been produced with vastly improved yield, milling quality, and resistance against disease. Of the world's wheat, about 44 per cent. is grown in N. America, and 36 per cent. in W. and S. Europe, India, Argentina, and Australia are big sources



Welsh Terrier, an alert and companionable dog

WHEELS FOR MOTOR VEHICLES

Modern Tendencies in Design and Construction

Other articles in this work that are of interest to the motorist include Motor Car; Motor Cycle and Motoring. See also Brake; Gear; Tire; Transmission.

Considerable changes in wheel construction have occurred during the last 25 years, chiefly as the result of the introduction of large-section low pressure tires, the use of wired or straight-sided tires instead of beaded tires, and the substitution of pneumatic tires for solid tires on commercial vehicles. Overall diameters of tires have not increased; the tendency is in fact in the reverse direction and wheels have become smaller and lighter.

Motor-car wheels carrying pneumatic tires may be classified broadly as spoke, wire, and disk. Further, the design depends upon whether the wheel is detachable as a whole or whether only the rim with the tire is detachable from the wheel. A complete fixed wheel with detachable rim is heavier than a detachable wheel carrying the same size of tire. Also in the event of accident such as a wheel striking the curb, a fixed wheel, if broken, will disable the car completely, whereas a detachable wheel may bend or collapse without damaging the axle, so that it is only necessary to fix the spare wheel. The detachable wheel is generally used in Great Britain, while the detachable rim has been used largely in America, but has now yielded place to the detachable wire or disk wheel.

The "solid" spoke wheel has now generally been replaced by the wire wheel with a well-typed rim as the disk wheel on ordinary motor cars and on the lighter commercial vehicles, while special disk wheels with flat base rims are largely used on the heavier commercial vehicles. Such wheels have now replaced cast

In its latest form this type of wheel, now in use on nearly every modern car, is constructed from a single steel pressing. It has the advantages of great strength, ease of cleaning and simplicity in manufacture. Known as the spoked disk type, it is secured to the hub by a number of studs and is retained by the usual lock nuts.

Bolts and nuts are concealed with a large central shell which is enclosed by a plated cover, as shown in Fig. 1. The earlier type of steel wheel was constructed from two stampings welded together to form a hollow shell. It is retained to the hub by studs in the same way as the spoked disk type.

Wire wheels have for many years been used on cars, and give a very satisfactory combination of strength and lightness.

The well-known Rudge-Whitworth wheel, shown in Fig. 2, consists of a steel hub or shell serrated on its interior to engage similar serrations F on the rotating axle, the driving and braking efforts being transmitted through the serrations. The inner end of the hub is enlarged to receive the inner wire spokes and is also coned to bear against a cone G on the axle. The coned surfaces are pressed into engagement by a lock nut H with two ears, which may be tightened up by a lead or raw hide hammer or a wooden mallet, but not by a metal hammer. The lock nut screws on to the axle and is formed with a double conical recess J which engages the end of the hub and is thereby locked securely against rotation, no other locking arrangements being necessary.

A modified type of wire wheel is secured to the axle by a number of studs and nuts as in the Sunkay wheel described above, but the nuts are located inside the hub and are concealed by a large plated cap which helps to keep them clean. A Rudge-Whitworth construction is shown in Fig. 3. The large steel hub K, although very strong, is made of comparatively thin metal and is secured by wire spokes to the rim, many of these spokes being arranged tangentially to the hub so as to transmit the driving and braking forces. The inner face of the hub is secured by studs and nuts against the outside L of the brake drum, the nuts M being rotated by the usual wheel brace. The opening on the outside of the hub is large enough to give proper access to the nuts and is

closed by a light sheet-metal plated cap N with a flanged edge entering the recess. Spring-pressed plungers O on flange retain the cap in position.

Pressed-steel disk wheels are much more popular than the other types on ordinary cars. A similar appearance can be obtained by securing light conical disks on the outside and inside of wire wheels. Apart from the matter of appearance, these disks reduce the labor of washing the many wire spokes and thus remove the most serious disadvantage from which wire wheels suffer in comparison with other types. Wire wheels are, however, now constructed with a smaller number of thicker spokes and these are more widely spaced, so that the cleaning difficulty is proportionately reduced.

Besides being popular on passenger cars and light vehicles, specially designed disk wheels are widely employed on the heavier commercial vehicles, a Sankay wheel being shown in Fig. 4. The rim of this wheel is of the flat-base type as distinct from the well-known commercially known pneumatics. A disk P is secured to the end of the axle by a number of studs and its outer edge is flanged and is riveted to a rim having an integral flange Q on one side. The other

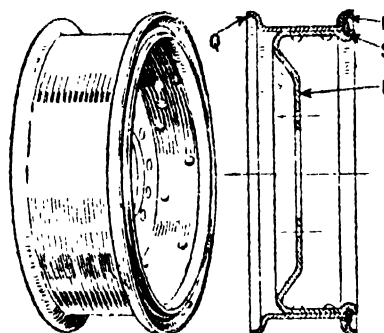


Fig. 4. Heavy disk wheel as used with giant pneumatic tire on commercial vehicles.

flange R by which the tire is retained in position, is formed by a detachable rim held in place by a spring ring S.

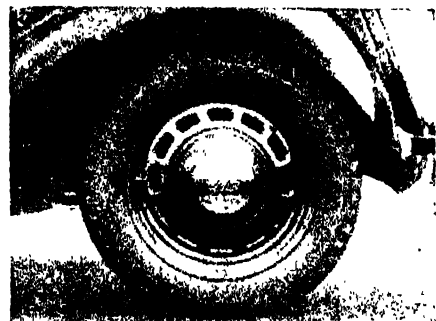
With all types of wheels care should be taken, when placing them in position, that the engaging surfaces are clean and free from mud or grit which might prevent them from being clamped up firmly.

WHEELBARROW. The wheelbarrow is extremely handy for conveying all sorts of garden material. As it is easily tipped either sideways or on end, its contents may be shot at any point desired without the necessity of handling them.

A hand barrow is also useful, but needs two persons to carry it. In its simplest form (Fig. 1) the hand barrow is a flat, shallow tray fixed to two lengths of wood which are formed with handles at each end, where they project beyond the tray. Four legs enable the barrow to rest conveniently on the ground.

The wooden barrow shown at Fig. 2 can be easily made. The wheel, generally a stumbling point with the novice, is not difficult to construct, and when hooped it is quite satisfactory. The trunks, or handles, should be of ash or oak; the mortise holes are bored out and then cut with the chisel to the sizes shown at Fig. 3. The slats, or cross rails, made of oak, ash, or elm, are 3 in. wide in the centre tapering to 2½ in. at the ends. They thus form a wheelwright's self-wedging tenon.

Begin by making the barrow frame, as shown at Fig. 3, then fix the two legs E, by securing them with a long ½ in. or ¾ in. bolt, which should run right through the frame and be secured with a washer and nut at the other side. This bolt and the hoop and axle

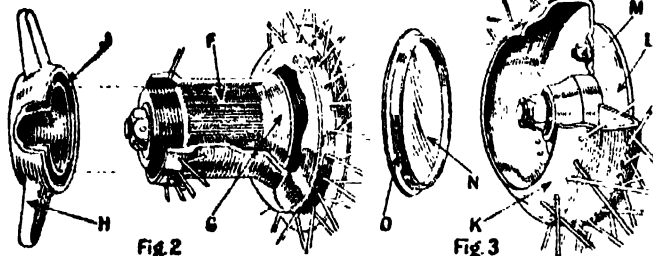


Wheel, Fig. 1. Spoked disk type, now used on most motor vehicles. Made from single steel pressing.

steel wheels with solid tires. In the ordinary motor-car industry changes in the popularity of different types of wheel are often due to fashion rather than to technical superiority.

Wooden wheels with detachable steel rims were largely used on American cars, these wheels being of the artillery type; that is, the inner ends of the spokes are clamped between two circular steel plates forming the boss or nave.

The circular rim or felloe (pronounced felly) is of wood, with a light metal rim which supports the steel rim carrying the tire. This type of wheel was long ago superseded in Great Britain by detachable steel wheels of similar appearance but of radically different construction.



Wheel, Fig. 2. Detachable wire wheel with central locking nut. Fig. 3. Detachable wire wheel with studs and securing nuts concealed within the hollow hub by a covering disk.



Fig. 1. Hand barrow consisting of a flat shallow tray with four handles and legs.

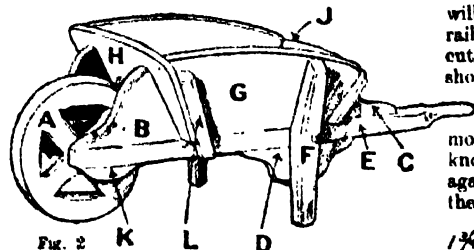


Fig. 2

will be all the metal work required from the local smithy, as all other portions are of timber.

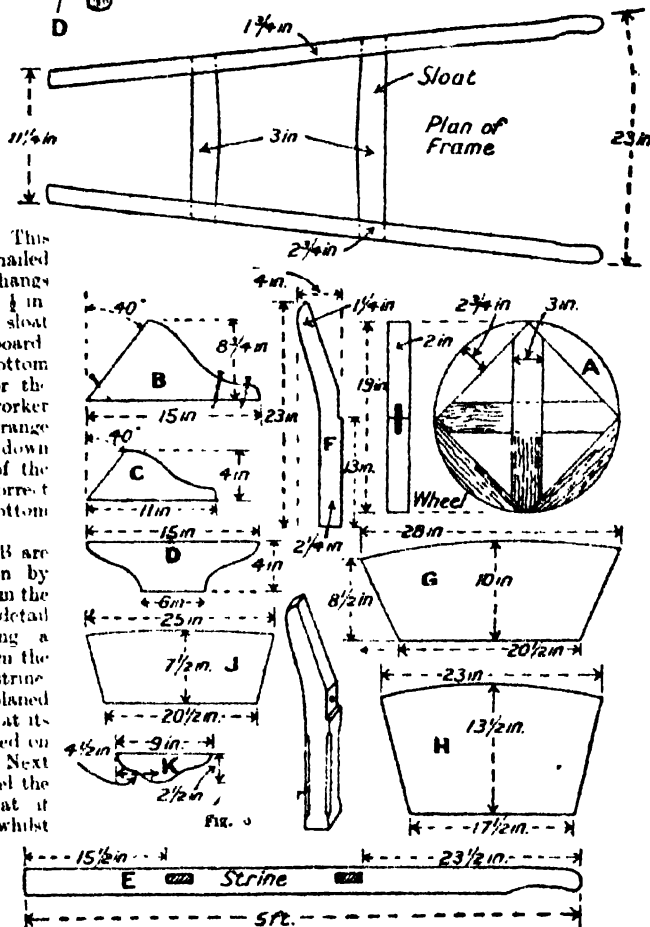
Fix in the bottom of the barrow out of $\frac{1}{2}$ in tongued and grooved boarding. This bottom portion is nailed on to the sloats; it hangs over the wheel about $\frac{1}{2}$ in and over the handle sloat 1 in. Select suitable boarding for the barrow bottom before setting out for the mortise holes. The worker will then be able to arrange for the sloats to stand down below the top edge of the strines exactly the correct thickness of the bottom boarding.

The two brackets B are now fixed in position by skew-nailing them from the top, as shown in the detail drawing, and putting a good nail or screw from the under side of the strine. The front piece H is planed slightly on the bevel at its bottom edge and nailed on to the brackets B. Next make the sides G, bevel the bottom edge so that it beds on the strine, whilst its side leans outwards and beds on the leg F. When the sides are fitted in a satisfactory manner, nail them to the leg F from the inside of the barrow, and nail their ends which engage with the front board H by nailing from the front of the barrow. Fit the piece J, and nail it to the ends H, after which fix the brackets C. The piece D, which steadies the legs, is now nailed in position.

To fit L, take a piece of wood, about 6 in. longer than you think will be required, and plane its edges so as to bed against the side G and the front board H. When neatly fitted to the required angle, sketch a line with your pencil to what appears to be the correct angle that will fit the strine. Saw the piece L to the sketched line, and, holding it to bed against the barrow side and the front, slide it down and see if it makes a good joint with the strine. It will probably be slightly out, but it will enable one to see the exact part that requires paring off with the chisel. Repeat this "cut-and-try" method until the desired joint is obtained, then cut off the surplus portion at the top of piece L, and nail L in position to the strine, front, and the side base off the corners of H and G, as shown.

Making the Wheel. The wood for the wheel should be of ash or oak. Plane up the two cross-pieces and halve them, as shown at Fig. 4. Find the centre and mark out the diameter of the wheel: the circumference of the circle

will coincide with the angle point on the cross rails. Set out the ends of the cross rails and cut the tenons with bevelled shoulders, as shown at Fig. 4. The bevelled shoulders make an angle of 45° with the edges of the cross rails. The next step is to slot mortise the rim rails A to fit the tenons, knock them up in their positions, and again mark out the complete circle. Take the rails A off the cross rails and saw and



Wheelbarrow. Fig. 2. Useful garden barrow which can be made at home. Fig. 3. Plan of frame and dimensions of the detail parts which are necessary for constructing the wheelbarrow shown in Fig. 2. Fig. 4. Showing method of constructing the wheel

spokes have them to the required line. Fix the wheel together by smearing the joints with thick paint and put a fine nail in the joints, so as to hold all together until the blacksmith hoops the wheel. A square hole is cut through the centre of the wheel after it is hooped, the axle is driven into this mortise and the wheel secured by a washer and nut.

The small axle brackets K are bored only half-way through their thickness, and this hole receives the axle. These brackets should be of hardwood, such as ash. The brackets B and K are held at the front with a $\frac{1}{2}$ in. bolt and nut, which goes through the string. The other end of bracket K is secured with two wrought-iron rails. Finish barrow with three coats of dark green paint.

The following particulars will assist the worker :

Wheel, all of ash, 2 in. thick, or, say, 1½ in. Ash: legs, ash or oak, 2½ in. square at bottom.
Brackets, B, C, and D, English elm, 1½ in. thick.
Sides (G), front (H) and back (J) of elm or other wood, such as white deal, 1 in. thick.
Brackets (K), ash, 1½ in. thick.
Struts, English ash, size as drawing.
Piece L, ash or red deal, 1½ in. by 1½ in.
Borrow bottom, elm, ash, oak, or deal, about ½ in. or ¾ in. thick, made in one piece or Y-jugue and groove jointed.

Many workers leave the sides, back and front boards roughly sawn with their ends

square until they are fitting their work. The overhanging portions of H and J are afterwards cut off to the required bevel, which will be proved by nailing on the sides. See Chisel; Joint; Mortise; Plane, etc.

WHEELK. The small shellfish known as a wheelk has a twisted shell of a conical shape. There are several varieties, the ribbon, the red, and the dog wheelk, all equally indigestible. Nevertheless, the wheelk is eaten in the same way as a winkle. See Shellfish.

WHEETSTONE. Used for sharpening scythes, hooks, axes, and other cutting tools, whetstones are made from stone, emery and carborundum, and in shape are either round or flat, the former being smaller at the ends than in the centre. Generally a coarse stone is employed without a lubricant, those with a fine grain, especially if made of carborundum, should be used with a thin mineral oil.

To sharpen a tool, the side of the stone is placed flat on the blade and moved along with a spiral motion, keeping it flat against the blade and placing the correct amount of pressure on the down stroke; the up stroke should be as light as possible to prevent the formation of a wire edge. The whetstone should be kept quite dry when not in use.

See Grindstone, Hone; Oylstone.

WHEY. The watery liquid that is known as whey, which remains in milk after the separation of the curd by coagulation, is composed of water and lactic acid with a small proportion of casein and butter and sometimes cream. It is used for making certain drinks and is valuable also in inflammatory complaints. Rennet is used in producing whey, but there are several other methods which can be employed.

For whey with curds soak a small piece of rennet in $\frac{1}{2}$ teacupful warm water and let it stand 2 hours. Pour 1 dessertspoonful of this liquid into 2 pints boiling milk and keep it warm but not hot until the whey begins to separate and looks clear. This dish is the old-fashioned curds and whey and usually is eaten with cream and sugar. Prepared rennet may be used in place of soaking a piece of rennet from the calf.

To make lemon whey, pour as much of the strained juice of a lemon into $\frac{1}{2}$ pint boiling milk as will produce a curd. The whey is then strained off and sweetened. Whey is sometimes flavoured with mint or other aromatic herbs and taken as a summer drink. It is not lowering like some of the acid preparations. Pigs are fed occasionally on food mixed with whey and are then termed whey pigs. See Cheese; Junket; Bonnet.

WHIELDON : The Ware. The Staffordshire earthenware produced at Fenton by Thomas Whieldon for about 40 years after 1740 is in demand by collectors. It is of interest in association with that of Spode, Wedgwood, and other 18th century potters.

Whieldon ware consists largely of the variegated or clouded pottery which preceded the great developments of creamware and jasper, especially imitations of agate and tortoiseshell, as well as those based upon the forms and colours of cauliflower, maize, pineapples, and melons. Especially prized are handsome octagonal plates finely mottled, with purplish brown, yellow, and green, and old Staffordshire pieces of this type, when not otherwise identified, are usually classed as Whieldon. His earliest pieces were agate

knife-handles and snuff boxes, now rarely met with except in spurious imitations. Other classes comprised tea, chocolate, and coffee pots in a fine black ware which was the precursor of black basalt ware.

Although the greater part of Whieldon's output consisted of useful articles, he also turned out image toys and chimney ornaments after the style of the example illustrated. Whieldon's salt-glaze pieces of this type are often called Astbury figures, the confusion being aided by the circumstance that neither potter made a systematic practice of marking his name. The two makes can be distinguished by the fact that Whieldon did not use red or brown clays, and his bodies are usually harder than Astbury's.

Much so-called Whieldon ware probably includes pieces actually made by Wedgwood, Booth, Warburton, Ralph Wood, and others. He was especially fond of modelling animals, including elephants, squirrels, parakeets, and poultry; in addition, groups of musicians and mounted soldiers are found in his pieces. See Pottery, Wedgwood.

WHIPPET. Although this breed was brought into existence by the colliers in the N. of England especially for the purpose of coursing rabbits, the whippet, or snap dog, has always been accustomed to a domestic life, and is an affectionate companion. The coat may be of almost any colour—black, white, red, fawn, brindle, blue, or a mixture of any of



Whieldon Ware. Delightful piece consisting of two small seated figures against a background representing an arbour c. 1765
British Museum

kept in golden sherry or Madeira casks, and rather heavier in texture. The newer whiskies are lighter and drier in taste.

Medicinal Value. Whisky has medicinal value principally for chills, fevers, colds, influenza and malaria. As a beverage diluted with plain water or with mineral water, it can be taken by gouty and rheumatic people when wine is not advisable. It is important to note that whisky should not be drunk with oysters or any kind of shellfish. See Alcohol, Brandy, Stimulant.

WHIST. The game of whist is played by four persons, two against two, although there are variants of the game suitable for two or three. Two packs of cards are desirable, one being used in dealing by each side. The players cut for partners, the two who cut lowest playing against the two highest, and the lowest of all deals first. In these cuts the ace counts as the lowest, not as the highest, card. If two players draw cards of equal value, not being the two highest or the two lowest, they must draw again.

The cards should then be shuffled, cut, and dealt, the shuffling being done by an opponent of the dealer and the cutting by the opponent on his right. The deal begins with the player who cuts the lowest card, afterwards passing to the one on his left, and so on until the end of a rubber, when the procedure begins all over again. In case of a misdeal the cards must be shuffled and dealt again. The full pack is used, and all the cards are dealt out, 13 to each player.

The four cards that are played out in a single round form a trick, and this is taken for his side by the player who plays the highest of its four cards. Players must follow the suit led, whenever possible, and the highest card of that suit wins, provided it is not trumped. The trump suit is decided for each game by the last card dealt out, this indicating the trump suit. This should be laid upon the table face upward, by the dealer and left there until the first round has been played, when he takes it up.

Scoring. A game consists of five points and a rubber of three games. A point is scored for every trick made in excess of six. Thus if two players win nine tricks they score three points. If the same players win the first two games it is unnecessary to play the third. Honours may be scored. They are ace, king,

queen and knave but not ten, as at bridge. If two players hold in one hand or in two the four honours they score four points; if they hold three they score two. Those players who, at the beginning of a deal, have a score of four cannot score honours.

The winners score two points, in addition to the value of their game for winning the rubber. They also score a treble, or game of three points, when their opponents have made no score; a double, or game of two points, when their opponents have scored one or two; and a single, or game of one point when their opponents have scored three or four. If the rubber has gone to the full three games the final score is made by deducting the value of the game won by the losers from the gross number of points made by the winners.

For revoking, or playing a card of a different suit when holding one or more of the suit led, the penalties are: The opponents, at the end of the hand, may either take three tricks from the revoking player and add them to their own tricks, or deduct three points from the opponents' score, or add three to their own score. This penalty can be claimed for as many revokes as occur during the hand, and a different one may be exacted for each revoke. The penalty however cannot be divided.

Cards must be placed on the table, or exposed, under the following conditions: If two or more have been played face upward at one time; if a card has been dropped, face upward, in any way on the table, even though it has been picked up again so quickly that no one has really seen it; and any card that the player holding it has named. The exposed cards must be left on the table and can be called, or played, by the opponents at any time. If two or more cards are played at once, the opponents have the right to call the remainder. It should be noted that a card does not become an exposed card if it is dropped on the floor or elsewhere beneath the table.

Whist Drive. Although bridge has supplanted whist as the popular card game, a whist party or drive on the progressive principle is sometimes held in connexion with clubs of all kinds, and sometimes as a means of raising money for charitable purposes. In the latter case persons buy tickets in order to attend. At all kinds of whist drives it is usual to give prizes to those who score the greatest number of points. There may be one, two, or more prizes for men, and the same for women.

The hostess should first decide how many persons she can accommodate or proposes to ask, and should then send out the invitations. The number invited must be a multiple of four, and if any persons refuse their places must be filled, unless the refusals happen to number exactly four or eight. Women and men should if possible be equal in number. Sometimes the hostess does not include herself in the number of players, and so is able to fill a vacancy if one arises at the last minute.

On entering, each guest is given a card, on which the scores will be entered. This bears also a number indicating the table at which the player will play first. The four players at each table cut for partners. One game only is played before the players move on. Each player puts down on his or her card the number of tricks scored, and has it initialled by his or her partner.

The usual plan is for the winning lady to go forward, that is to go from table 4 to table 5, for example, and the winning man to go backward, i.e. from table 3 to table 2. Other arrangements, however, are sometimes made, this matter being decided by the hostess beforehand. Half-way through the programme refreshments should be served. Thus, if an evening's play consists of 24 games, refreshments will be taken after the completion of the twelfth. At the end of the play each player



Whippet. Champion of this sporting breed

them. In size he is variable, but should be about 17 lb. in weight, the bitch a pound or so less. See Dog.

WHISKY. Whisky is a spirit distilled from grain. It is made from malt, malted barley, or from a mixed grist of barley malt and dried barley and oats or from a mixture of other malted and unmalted cereals.

Pure malt whisky is made almost exclusively in Scotland. Irish whisky is made of about $\frac{1}{2}$ malt to $\frac{1}{2}$ oats and maize; it needs longer keeping than Scotch whisky and should be at least 10 years old. Blending and diluting take place in the bonded warehouses. Whisky, like brandy, is naturally white, and takes its colour and, to a certain extent, its flavour from the sherry casks in which it is matured. It is also coloured by the addition of caramel (burnt sugar) or adding a matured wine. The older whiskies were darker in colour from being

adds up his or her score, and the host or someone else asks for high figures, say, in excess of 100. Eventually he gets to know the highest scores, and, having examined the cards, announces the winners. The prizes, provided by the hostess, are then given away. At some whist drives a booby prize is given for the lowest score, for instance, a wooden spoon.

In order to break the monotony of the scoring, various devices are introduced into the programme, and these are usually indicated on the scoring cards; if not, they can be announced by the host. For instance, in one round, instead of trumps being decided by a turned up card, they are fixed at a certain suit all over the room, e.g. clubs. Again, the winners in one round are allowed to score double, or for a change each pair is credited with the score of the opponents, thus making the particular game one in which each aims at making as few tricks as possible. See Evening Party; Progressive Party.

WHITEBAIT. When in good condition, whitebait, which are the fry of sprats and herring, have a silvery sheen. They must be eaten soon after they are caught. They should be kept on ice until time for cooking. Whitebait are in season from March till September.

The fish must be handled as little as possible and the fat used must be at the exact heat necessary to crisp them. Drain the whitebait in a clean cloth and see that all the water is absorbed, then turn them on to a floured sieve, dredge them with flour, and shake them gently.

Have the fat heating ready for the whitebait, and when it reaches 400° turn the prepared fish into a frying-pan and plunge them into the boiling fat. Fry for 2 or 3 min., turn the fish on to a sieve to drain and serve very hot. They should be dished on a folded fish napkin and sprinkled well with salt. Cut brown bread and butter, quarters of lemon, and cayenne pepper should be handed round.

To devil whitebait prepare as above, then season with cayenne pepper, raise the temperature of the fat rather higher than it was for the first time of frying, and plunge the fish into the fat, and after 1 min. drain, season, and serve very hot. See Fish.

WHITE CURRANT. The white or pale yellow currant is less commonly planted than the red varieties of this popular bush fruit. It needs exactly the same treatment as the red currant. Some of the best varieties are White Dutch, White Transparent, and White Versailles. See Red Currant.

White Lead. See Paint.

WHITE MICE. The albino and the black-eyed white mice thrive in captivity if kept in a clean, dry cage and fed once or twice daily. Apart from a little vegetable food and bread soaked in milk, the stock food is composed of equal quantities of canary seed, millet seed, and oats, the daily allowance being a small teaspoonful per head. The cage must be cleaned very thoroughly three times a week and food pans must be kept scrupulously clean.

Mice should always be kept in couples, as they do not thrive singly. If several are kept in one cage, care should be taken that there is only one male. If a litter is expected, a small supply of clean hay should be provided and the doe removed to a separate cage. Mice should

be lifted up by grasping the tail firmly about half way up. The best covering for the floor of the cages is dry sawdust mixed with a little sanitas powder.

WHITENING. The name of whitening or whiting is usually given to the well-washed residue of chalk. It should form, when crushed, a fine powder, and when placed in water should separate into fine particles at the bottom of the vessel and is not soluble. It is used for many purposes in the workshop and the home. In making whitewash it is mixed with size; it is used for polishing and it forms the basis of several kinds of wood filler.

White Sauce. See Sauce.

WHITEWASH. Whitewash is usually a mixture of slaked lime and water. Whitening is also used. The ingredients that are required for internal work are the whitening, some size, and a little ivory black or blue to keep the colour white.

To prepare the whitewash, break up a quantity of the whitening, say, about 6 lb., in the pail, which should contain sufficient water to cover it. Allow the whitening to become thoroughly soaked or dissolved, and pour off any surplus water. Having stirred it, add a quart of hot double size, previously prepared. The mixture is then given a thorough stirring and set aside to cool when it will form a jelly-like compound. Blue or other material should be added at the same time as the size.

When required for use, the mixture is diluted with cold water and applied immediately. For exterior work ordinary lime may be used as paste, and sufficient of this used with water to form a thick liquid. The paste is best kept in a box or pail sunk in a hole in the ground and covered with water to keep it from drying. When required for use, the water is poured off and the lime, a smooth white mixture, is employed.

Whitewash or lime-wash made in this way can be applied directly to the exterior surface of brickwork with a large, old whitewash or distemper brush, one good coat being usually sufficient. It should not be applied too thickly or it will be liable to flake off, nor should the mixture be too weak or it will not dry with a clear surface. If the brickwork has not previously been whitewashed, it should be brushed down with a stiff bristled brush. If the surface has already been whitewashed, it is desirable to wash it down with copious supplies of water and brush it thoroughly.

Ceilings. To whitewash a ceiling more preliminary preparation is necessary, either covering the floor with old newspaper or dust sheets, or entirely removing the floor covering. All small furniture should be placed in another room, the larger pieces being assembled in the centre of the room or in any other convenient position and covered with dust sheets. To keep the whitewash from splashing over the floor and the walls, it is a good plan to fix a dust sheet or other covering over the walls, or at least those portions where whitewashing is in progress.

The whitewash is then prepared as already described. Another pail or bucket filled with clear water will be needed for the preliminary washing down, which simply consists of brushing the ceiling vigorously with a disused whitewash brush. This removes the bulk of the

previous coat of whitewash. The ceiling is allowed to dry, and if very good results are required it may be covered with clearsize, a thin liquid obtained by dissolving some size and a small quantity of alum in hot water and adding a little whiting. When brushed over the ceiling, this stops the suction and makes the whitewash take better, but it is often omitted on ceilings in good condition.

As soon as the clearsize or the washing off is dry, any cracks are made good with Keen's cement or a plaster, and the whitewashing proper is commenced. It ought to be continued uninterruptedly until the whole of the ceiling is finished. The work should commence at one corner of the room and may include the cornice and frieze, if desired. The whitewash can probably be applied by the amateur to the cornice and mouldings with a small brush, but the bulk of the ceiling is best dealt with by the large distemper brush.

There is a knack in applying whitewash which it is not easy to describe. The essential thing is to charge the brush with sufficient colour to enable the largest area to be covered without relling the brush. To do this the brush must be immersed fully in the whitewash, any surplus is wiped off by stroking the brush on the edge of the pail, any surplus at the tip being similarly wiped off on the edge of the pail or on a bar placed across it. Under these conditions, the brush will be found to hold a considerable quantity of whitewash which may be applied to the ceiling with a kind of slapping and stroking motion. In a sense the whitewash is flicked on the ceiling, on the first part of the stroke, and the other part of the stroke is a smoothing operation.

Whitewash is practically transparent while it is wet. The quantity that is applied can be judged by the feel of the brush while it is being wiped over the surface of the ceiling. At the first application of the brush the feeling is that there is too much of the fluid, whereas toward the end of the stroke there is a drag. The correct quantity is that which is applied when the brush is about half full. The manner in which the brush works then should be taken as the standard to be adhered to throughout.

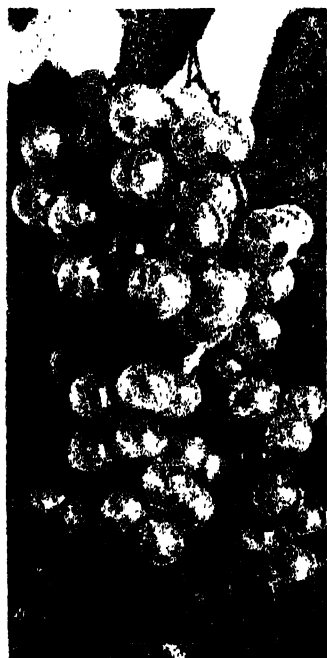
WHITEWOOD. The timber that is known as white wood is really spruce. It is less strong and durable, and therefore less suited for outdoor work, than is red timber, but has a number of indoor uses. When employed for joinery purposes it requires keen tools for its proper manipulation, but when it is finished it presents a fine lustrous surface with a creamy colour. It thus forms an excellent material for table tops, dressers, cupboards and other fittings of a house; also for floor boards, as it will keep its clean appearance. The name whitewood is also given to bass (s.p.).

WHITING: How to Cook. Small haddock are sometimes substituted for this fish, but they do not possess its delicate flavour. When unskinned, the haddock may be easily distinguished by its dark markings and the barbule on the chin. The whiting when skinned looks compact, and the head is small. Rock whiting is the best kind.

For frying, the whiting should be skinned after being gutted. The head should be turned round and the tail thrust through the eyes so that a circle is formed. When trussed, dip each fish into seasoned flour. Then brush with beaten egg and cover with breadcrumbs.

It is better to use a frying basket when cooking whiting, as the shape will be preserved intact. Fry the fish, according to size, from 5 to 7 min., then drain and dish it on a folded fish napkin or paper. If three or four whiting are to be served, stand them up on the dish with the tails and heads uppermost, and garnish with pieces of lemon and fried parsley. Serve with shrimp or anchovy sauce.

To bake whiting, prepare three fish, skin and fillet them, making two filets out of each



White Currant. Ripe fruit of the variety known as White Dutch

whiting. Dry the pieces well, and arrange them in a greased baking or gratin dish. Season them with salt and cayenne, and add a little ground mace. Work together $\frac{1}{2}$ oz. butter or margarine with the same quantity of flour into a paste, and distribute this over the fish. Then pour on to them $\frac{1}{2}$ a wineglassful port, the juice of $\frac{1}{2}$ a lemon, and $\frac{1}{2}$ a teaspoonful chilli vinegar. Cover them entirely with a thick greased paper, and bake them in a moderate oven for 15 min. When cooked, remove the paper and serve in the gratin dish. While the fish is baking, baste it once or twice.

Whiting can be fried, dipped in batter instead of egg and crumbs. Fillet three fish and place the pieces in a deep dish with three shallots peeled and chopped, a bouquet garni, seasoning, $\frac{1}{2}$ pili vinegar, and rather more of salad oil. Steep the fish in this mixture for 3 hours, turning it two or three times. Then drain the fillets, dip each in a butter batter, and fry till a good golden brown colour. Garnish the dish with fried parsley and serve with parsley and butter sauce.

WHITLOW. The term whitlow is applied to inflammation of the fingers or toes, caused by the entrance of septic microbes. These may make their way into the tissues through scratches or punctures.

The septic poisoning may extend from the finger up the hand and forearm, along the lymphatic vessels to the lymphatic glands in the arm pit. The infection may now extend into the blood vessel, giving rise to blood poisoning. In other cases there is a formation of pus or matter in the finger. This should be let out at once, otherwise serious danger threatens the usefulness of the hand.

WHITLOW GRASS. This is the name of a group of small early flowering evergreen rock garden plants. They must be planted in gritty well-drained soil and a sunny place. The botanical name is *Draba aizoides*, 3 in., which bears yellow flowers in April is a favourite kind; others are *launaeformis*, 3 in., yellow, and *pyramidalis*, 3 in., blue rose, the last named is usually grown in a mixture of stone chips and soil. These plants are best propagated by seeds sown in spring; they should be protected by raised pieces of glass in winter to throw off excessive rain.

WHOLEMEAL. Wholemeal differs from ordinary flour in that it retains the bran normally removed from flour in the course of milling. It is darker and does not keep so well, but bread made from it is richer in proteins and phosphates and other mineral substances than is bread made from white flour. If the wholemeal flour has been finely ground, the bran, normally indigestible, readily can be absorbed by the body and the substances contained in it are then very beneficial to children. The bran also affords a physiological stimulus to the large bowel and so tends to prevent constipation. See Bread; Diet; Flour.

WHOOPIING COUGH. Pertussis, or whooping cough, is an acute infectious disease, in which there is catarrh of the respiratory tract and a characteristic cough. This comes on in spasms of 10 to 20 short coughs succeeded by a long, deep breath which is accompanied by a whooping sound, caused by spasm of the vocal cords.

It is a dangerous disease when it occurs in infancy, or in older children who are debilitated from any cause. The disease is infectious from the beginning of signs of irritation of the bronchial tubes. The incubation period lasts usually about 10 days, and then the child may appear simply to have a bad cold.

The cough may assume its spasmodic form in from a few days to three weeks from the onset. During the cough the child's face may become blue and the eyes may bulge and become bloodshot. The cough may bring up

some thick mucus and often causes vomiting. If vomiting is very frequent, the child's nutrition will suffer. Someone should always be at hand to help the child during a paroxysm and to reassure it.

It often happens that a child suffering from measles develops whooping cough, and the converse is also true. The most serious complication is broncho-pneumonia.

Immediately a child who has not already suffered from whooping cough shows signs of catarrh of the nose and bronchial tubes, during an epidemic of the disease, it should be isolated. If confined in bed it is of the greatest importance that the sick room should be kept ventilated day and night. The doctor will advise upon the use of drugs and fumigations.

The patient should be fed with easily digested food, and if there is much tendency to vomit should have frequent meals of milk. When convalescing, malt and cod liver oil will be beneficial, and a tonic may also be given. Children who have suffered from whooping cough are not supposed to go back to school till the end of five weeks at least, and only then if the characteristic cough has been gone for two weeks. See Cough.

WHORTLEBERRY. This belongs to a group of dwarf shrubs, known botanically as *Vaccinium*. Known also as hillyberry and lowberry, it bears blue berries valued for cooking purposes. The cowberry (*Vaccinium vitis-idaea*) with red berries is another British shrub. One of the best of the exotic kind is the American blueberry (*Vaccinium corymbosum*), which grows 2 ft. high and bears pale rose coloured blooms in early summer. All need moist, peaty soil and slight shade, and can be propagated by cuttings or seeds.

WICKERWORK. This is another name for basketwork, made with osiers, and is applied to baskets, stands, tables and chairs. Wickerwork repairs are often not worth troubling about, owing to the limitations of the material. After being in use for some time, the osiers become very dry and brittle, and if replaced with new material there is always a risk that the new stuff will prove too strong for the old parts left in. These particularly noticeable when new lengths are woven between the old stakes.

If wicker chairs are damaged, the better plan is to effect repairs with a suitable thickness of pith cane rather than with osier rods. The material can be rendered quite pliable by soaking it in water just before use, and it will dry out without straining the existing portions.

White wickerwork should be washed with a strong cold solution of salt and water, then wiped as dry as possible and left in the sun to bleach. Hot water, which destroys the natural polish of the wood, should not be used, neither should soap nor soda, both of which have a detrimental effect. Crown wicker furniture is best cleaned by rubbing it with a rag dipped in paraffin. See Basket; Cane; Osier.

WIDGEON. The season for the widgeon is from early autumn till March. The birds should be selected by pressing the pinnions; if these are pliable the flesh is tender. To prepare them for table, pluck, draw, and truss as for ducks, but do not stuff them.

To roast widgeon brush the bird well over with butter and roast it in front of the fire if possible basting frequently. A Dutch oven (qv) may be used with advantage. From 15 to 25 min. is considered sufficient to cook widgeon, as they are supposed to be of superior flavour if underdone. When ready score the breast lightly and sprinkle over it lemon-juice and seasoning. Serve very hot with a made gravy, and garnish with watercress. The gravy should be rich and flavoured with port wine and red currant jelly. When carving remove the whole of each side of the breast in the slice. See Game.

WIFE - Legal Position. As against her husband a wife has a right to be maintained according to the husband's rank and means, and for this purpose, unless the husband is making her an adequate allowance, she may pledge his credit for necessities. The word necessities in this connexion is interpreted very widely.

What is necessary for one wife would be a mere luxury for another. For instance, the wife of an earl would be entitled to order evening dresses at an expensive dressmaker's, but not so the wife of a small tradesman or agricultural labourer. If a husband and wife are living apart, the wife, unless she has an adequate allowance, can support herself in this way so long as she can find tradespeople who will supply her with goods on her husband's credit. She forfeits this right, however, if she commits adultery.

With regard to the guardianship and custody of children, when a husband and wife are living together the husband is the guardian, and if they separate he has a prima facie right to the custody of the infants, but this right is more qualified than it once was, because on the application of the wife the court will unless she is an unfit person, invariably order that he have the custody of very young children and all girls of any age. At the same time the husband remains, in law, the guardian of the children.

A wife cannot compel her husband, whether living with her or not, to grant her an allowance. Where a husband dies on or after July 13, 1909, his wife may apply to the court for an allowance from his property if he has not made proper provision for her. A husband has a life right. If he dies intestate, whether there are children or not, she has the right to take all the personal chattels, i.e. the household furniture and effects, including such things as motor cars which are not used for business, and the sum of £1,000 free of all death duties and costs. If there is no issue, she also takes a life interest in the realty of his estate, and if there is issue, then a life interest in half of the estate. A husband possesses a similar right in the property of his deceased wife. See Child Divorce; Guardian; Husband; Marriage.

WILD DUCK. Probably the best way to choose a wild duck is to examine the feet and press the pinions. The feet should be supple and the legs limber, and the pinions when pressed should not be rigid. These birds are in season from August to February. The only objection is a slight bitter taste, which is easily removed if the bird is put into the oven in a tin of salted water and cooked for 10 min. The tin should be covered. After this the duck is trussed and roasted in the same manner as tame duck. See Duck.

WILD GARDEN. Many gardens of fair size have a portion where aspect, soil and other conditions are not favourable for the choicer plants. Such positions will accommodate a host of shrubs and plants of somewhat grosser habit at small cost and with comparatively little labour. However rough the spot may be, there is opportunity for planting bulbs, perennials, and shrubs, and, as bold grouping is of the essence of this form of natural gardening, it follows that the greater the space that is available the more effective will be the result.

Spring-flowering bulbs may be naturalized among the trees and shrubs, and some of the lilacs are suitable for planting in partially-shaded places, where also the Japanese primrose and the common primrose still flourish. Some of the shrub roses are splendid plants for the wild garden, especially the musk roses named *Eden*, *Penelope*, *Prosperity* and *Pax*; *Rosa Meyens*, which bears rose-red single flowers and large red hips, and the

Japanese briar (*Rosa rugosa*), valued both for its flowers and fruits. Other shrubs suitable for planting in the wild garden are *Berberis Darwinii*, *Berberis stenophylla*, mock orange, Spanish broom (*Genista hispanica*), the common broom (*Spartium junceum*), double gorse, the common *Rhododendron ponticum*, heather, Mahonia (*Berberis aquifolium*) and the pheasant berry (*Leycesteria*). See Rock Garden; Water Garden, etc.

WILL: How to Make. A will is a declaration of the person making it with regard to matters which he wishes to take effect upon, or immediately after his death. It need not necessarily be a disposition of property, because a man may make a will merely to appoint guardians of his children, or to appoint an executor. But as a rule a will is a document by which the person making it, who is called the testator disposes of his property after his death.

In England anybody of the age of 21 years and upward may make a will, and by it he may dispose of any property he has, or to which he is entitled, or over which he has a power of appointment. Except as to the wills of soldiers on actual military service or mariners actually at sea, every will must be in writing and signed by or on behalf of the testator. Such signature must be either made or acknowledged in the presence of two witnesses who are both present at the same time and both affix their signatures in each other's presence as well as in the presence of the testator. A will may be written on anything which is capable of receiving writing, and either in pencil, ink, chalk, or any other substance that can make a mark. A testator who cannot write may make his mark, which will be accepted if it is duly witnessed.

Valid and Invalid Wills. It is essential to the validity of a will that the testator should act voluntarily, i.e. of his own free will and be of sound disposing mind, which means that he must know he is making a will and know what the effect of the will is. For this reason a lunatic cannot make a will unless in a lucid interval. Further, if it be proved that a will was made under undue pressure, either physical or mental, the court will upset it. At the same time there is nothing to prevent, for instance, a wife requesting her husband to make proper provision for her or her children in his will.

The kind of case where a will is upset owing to undue influence is where some person very old or feeble in mind or body is more or less compelled by someone who has great influence over him to make a will in that person's favour, or to give favour to someone through whom that person derives some benefit. A will induced by fraud will also be avoided, e.g. where a man made a will in favour of X, X having fraudulently told him that his, the testator's, only son who was on a voyage, had been drowned.

Until 1926 a will was revoked by the marriage of the testator, but now a will which is made in contemplation of marriage is not avoided by that marriage taking place. A young man about to marry, and wishing to make a will to provide for his future wife before the ceremony, should begin somewhat in this form: This is the last will of me, John Jones, of 490, High Street, Peckham. Whereas I have arranged to marry Annie Robinson, now I make this will in contemplation of such marriage. He should then go on to dispose of his property according to his wishes and responsibilities.

A gift by will which is illegal, or against public policy or morality, is not good, e.g. where a man left a fortune to his son on condition that the son separated from his wife; or a gift for some superstitious purpose, as where someone left money for the teaching of African witch doctors. Everyone who

makes a will should take great care to begin by appointing an executor, or even more than one, because if no executor is appointed a great deal of extra trouble and expense is incurred in proving the will.

A will is, by the law of England, always revocable, even though it is expressed to be irrevocable. It can always be revoked by a later will or codicil which purports to revoke the former, and, indeed, most wills begin with the words, "I revoke all former wills and testamentary dispositions by me made." It can also be revoked by cancellation or destruction, but the mere destruction of a will if it is done without the intention of revoking it, does not revoke it, and it can be proved by evidence, such as a solicitor's draft or even a verbal recollection of anyone who has seen it. In the same way, if the testator tears up his will when he is insane or drunk, it is no revocation. As a will can only be revoked by the testator himself, it follows that he cannot delegate to somebody else the power of revoking after his death.

Alterations in Wills. If it is desired to make an alteration in some of the dispositions of a will already made, it is not necessary to make an entirely fresh will. The testator can execute what is called a codicil, which ought to begin with the words: This is a codicil to my will dated the X day of X. He can then, for instance, revoke a particular legacy, or appoint a fresh executor, or give an additional gift. Any such codicil must be signed by the testator and be witnessed.

If he intends to make an additional gift to someone who already benefits, he should be careful to make it quite clear that it is additional. Thus, if he has left £500 to his son John and wishes to increase it to £1,000, he should say: Instead of the £500 given to my son John, I bequeath the sum of £1,000. Or he should say: In addition to the £500 bequeathed by my will I give him another £500. If he simply says: I give my son John £1,000 the question will arise whether he means John to have the original £500 and the £1,000 as well. Clearness is the very essence of making a will, and technical terms are not at all necessary.

The ordinary family man who makes a will to divide his property amongst his children will generally find it best to divide it in proportion rather than in sums of money, because sometimes investment diminish or increase in value, and although the testator may think that his investments are worth £5,000, and that he is safe in saying that he gives £1,000 to each of his sons, it may turn out that the investments cannot be sold for more than £4,000, and very often complications arise.

If a testator intends that a business which he has shall be carried on for the benefit of his wife or family, he should make it very clear that his trustees are to have that power. He should also make it quite clear if he intends his money to remain in any particular kind of investment, e.g. colliery shares, otherwise the executors and trustees will be bound to convert all the shares into money and invest it in trustee funds.

Scots Law. As in other matters the law of Scotland on the subject of wills differs in some respects from that of England. Mutual wills, or wills made by two persons jointly, are permissible in Scotland although not in England. More important is the provision of Scots law by which a will is valid, although it is not witnessed, provided the testator has written it wholly in his own hand. See Administration; Executors; Estate Duty; Intestacy; Legacy.

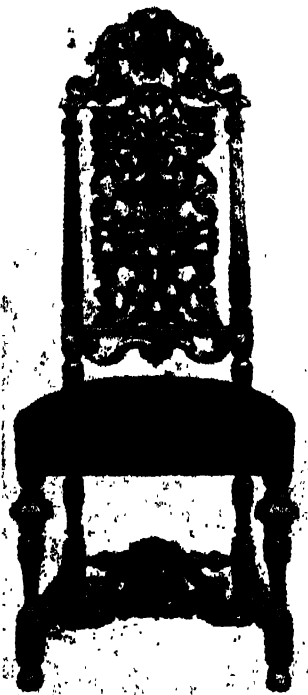
WILLIAM AND MARY STYLE. It has been said that the decorative arts in the reign of William and Mary reached a gorgeousness and beauty that has never been surpassed. The style was the culmination of the baroque period in English decoration, marked by a development of the lavish ornament in fashion during the later Stuart times, and also of the Dutch influence, which had already been seen in the furniture of the reign of Charles II, made after 1670 when a number of Dutch craftsmen, particularly cabinet makers, were employed in England by rich patrons.

Architectural changes also showed Dutch design or inspiration. In some of the earlier houses built in the reign of William III the characteristic feature of the scrolled outlines to the gables at each end of the roof is found, while towards the close of the reign and during that of Queen Anne, Dutch architects had considerable influence on English house planning.

Reception rooms in the great houses were spacious and magnificent. Wall panels were large, with richly carved mouldings surrounded by applied swags of flowers, fruit and foliage, after the manner of the Graining Gildings. Pilasters flanking doors, windows and chimney pieces, also pediments to these, and the ceiling cornices were decorated with carving. Oak, walnut and pine were used for panelling the last wood being sometimes painted green and the carved enrichments gilded. Cedar, pear and lime were the woods chiefly employed for the applied carvings on oak or walnut. Fire places were smaller than in the Jacobean period and usually had marble rectangular surrounds. The hearths were provided with large fire dogs, as logs were still the fuel employed.

Floors were of parquet often inlaid and partially covered with small carpets. These were usually imported, but at the Wilton factory English carpets had begun to be woven. Lighting fittings included central chandeliers of metal or painted wood and candle sconces with reflectors of bright metal or mirror glass.

Characteristic Furniture. Chinese lacquer was fashionable at this period, beautiful cabinets being mounted on gilt or silvered stands after the style of the somewhat earlier piece illustrated in Fig. 1 of the article on Lacquer Work. Lacquer cabinets were imported from Japan done in the Chinese manner, and though the finest examples were not allowed to be exported from the Imperial factory in Japan, some good pieces were made there for the foreign market. The carved wooden stands were made in England, later pieces of the 17th century showing



William and Mary style. Fig. 1. Chair of carved walnut, an early piece of this period.

By permission of the Director, Victoria and Albert Museum, S. Kensington.

the ornate stretcher work which is such a feature of the William and Mary style. A beautiful writing table in black and gold lacquer is illustrated in Fig. 2. The flat shaped stretcher is most characteristic, as also are the heavy bun feet.

Dutch influence is noted in the furniture by the more extensive use of upholstery and costly textiles, and by the introduction of the cabriole leg, although this latter was not the typical furniture leg of the earlier pieces of this period, a good example of which is here illustrated on the chair of beautifully carved walnut. This chair is 4 ft. 3 in. high and is upholstered in green figured velvet. Twisted spiral baluster and spindle legs are also found

Oyster veneering is typical of this style and so is the finest arabesque marquetry. See Jacobean Style, Marquetry, Oyster Grain Queen Anne Style.

WILLOW. This is one of the best trees for planting in damp or even wet land, the weeping willow (*Salix babylonica*) is a most beautiful waterside tree. The blue willow (*Salix caerulea*) provides the wood from which cricket bats are made. Several of the willows have coloured bark which is most ornamental in winter, the best of these are vitellina, which has yellow and cardinalis which has red bark; these must be hard pruned each spring. Willows are largely grown for the purpose of basket making, and one kind, *Salix fragilis* is used in the manufacture of riddles or sieves. *Salix alba* is one of the best willows for general planting. The catkins of two British willows (*Salix caprea* and *caerulea*) provide the popular "palm" in spring. Willows are easily propagated by cuttings 12 inches long inserted out of doors in autumn.

Uses of the Wood. Willow is a soft, light wood with smooth, lustrous surface, tough and pliable, brownish or yellowish white in colour, it may be bruised by a blow but is not likely to split. Its most important use is for cricket bats, but only the best parts of the tree are good enough for this purpose, and it is cleft instead of sawn. Willow as flooring wears well and has a smooth surface susceptible of a fine polish besides being non-inflammable. It is employed for hurdles, poles, cutting boards, knife boards, and by the cooper and turner; scrap willow is used in toymaking. Sometimes spade and shovel handles are of willow, and next to alder it is the best wood for clogs.

The chief varieties are known as white and red willow; the latter which has a red tinge is generally preferred, but it is not plentiful. The willow is much cultivated for wickerwork and basket making and is not allowed to grow beyond the stage of osier or withy rods. With this are used the twigs and small branches which are cut periodically from growing pollard willows. Another way in which young willow is used is by splitting it into thin slices for making woven crates, hampers, baskets, and oats. See Osier; Wood.

WILLOW HERB. The common name of a group of hardy plants, of which the most familiar is the rose bay (*Epilobium angustifolium*), which grows wild in many parts of this country, it reaches a height of 4 feet and bears rose purple flowers in early summer.

WILLOW PATTERN. Based on several Chinese originals, the willow pattern was evolved by Thomas Minton, the engraver, for use on china dinner ware. In the earliest version, dated 1780, there were only two figures on the bridge, no flying doves, and no cedar trees bearing the so-called apples. It was introduced at Caughley by Thomas Turner, who printed it under the glaze, generally with a blue crescent mark, and also with C and S or even the crossed swords device.

The engraver and his assistants supplied copper-plates of the pattern to other works,

after varying the details and introducing the doves and the fruit. Josiah Spode, who printed his willow pattern by transfer in 1784, had a design with a pagoda on the left and a butterfly border, and another with a dagger border. The willow pattern sprang into favour from the first and was applied to a wide range of wares. Davenport plates have 25 apples, with a special fret pattern round the rim. Spode has 32 and Wedgwood 34, while Adams plates have 32 and the dishes 50. Both Spode and Wedgwood did the Caughley pattern as well as their own. Differences are observable in the depth of the blue tint in the printing, the Adams cobalt being especially sought after. During the early 19th century the pattern was produced on various bodies often marked with the Staffordshire knot, and not always in blue. It remains one of the standard designs of the modern potter and is still made by Minton's and other historic factories in the traditional form. See China Davenport Ware, Pottery, Spode etc.

WINCEY. This fabric is a wool and cotton mixture. It is obtainable in white, some colours and stripes, and is especially suitable for children's light-weight pyjamas. The little wool that it contains makes it warmer than cotton of equal substance and less perilous than flannel.

WINCH. The use of a winch is for winding up rope etc. on a revolving drum in various kinds of apparatus used in hauling. It comprises a crank with a handle and geared by means of cogged wheels to a drum. A winch is commonly seen in the apparatus used to draw water from a well, it is used for winding the rope on a crane and is generally provided with a pawl to prevent unwinding.

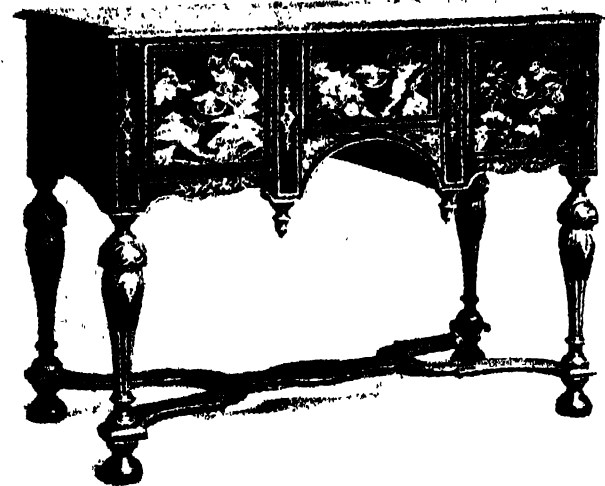
Wind: In the Body. See Flatulence.

Windflower. This name is given to plants of the genus *anemone* (q.v.)

WINDOW. The form of a window depends chiefly upon its position in the building and the room which it is to light. Its proportion necessarily varies, and the type will be chosen to suit the design of the building.

The various types of window include the bay, which may be square, angular, or curved, the casement, plain and transomed in both metal and wood, the dormer, the French, also made in metal and wood, the gable, the jute, the mullion, and the oriel. The sash window is more commonly fitted than any other, but in modern construction it is being superseded by the more convenient casement. The mullioned window with transoms, the bay with latticed casements and the oriel in a simple form are all adapted to Tudor styles in building.

Typical examples of most of the foregoing types are fully described and illustrated in this Encyclopedia, under their respective



William and Mary. Fig. 2. Writing table in black and gold lacquer About 1700
Courtesy of Gill & Regate

on the earlier chairs, tables and stands. In some of the chairs the backs were entirely upholstered, while in others the framing was exposed. Some had cane panels. Beech or walnut was used for frames, the former being often painted or gilded. Fringe and galons were employed to trim both chair and settee coverings of damask brocade, velvet and needlework.

The cabriole leg seen at the end of this period was pronounced in curve, and usually terminated in a heavy bun foot. The idea of these feet originated in the blocks of wood placed by Dutch housewives to save the legs of their furniture from being rotted by the constant damp arising from well-washed tiled floors.

Cabriole legs were united by hooped or curved stretchers, often with a turned finish in the centre. This system of under-framing chairs replaced the carved deep rail below the seat directly connecting the two front legs, with simple turned rails running at the sides and back. Completely upholstered settees had high arched backs and six or eight legs braced by crossed serpentine stretchers.

During the later period of the style carving gave way to marquetry for the decoration of cabinets, secretaires, table tops and chests of drawers. Such ornamentation was helped by the arrival of fine woods from the Dutch Indies. Entire surfaces were covered with thin veneer, the pattern and background being fretted out by cutting through two or more sheets of wood at a time and interchanging pattern and background. The carcasses were of pinewood. In cases where the geometrical design was relieved by floral work the motif is frequently seen to be the jasmine, treated conventionally, a form of decoration which dates a piece fairly accurately as belonging to this period.



Willow Pattern. Plate decorated with this quaint pattern derived from China and now a standard English design

headings. (See Glass and Glazing, Leaded Lights, Stained Glass.)

An inexpensive glass is obtainable through local glaziers or boulder which transmits the vital ultra violet rays shut out by ordinary window glass. Many people have this glass fitted to the windows of nursery and living rooms. It is made up in clear sheet, plate and cathedral form for sash windows or leaded lights. This glass is helpful in counteracting the ill effects of a badly lighted basement flat.

Windows may be recessed, flush, or may project, in all cases they should fit into a rebate in the wall, which may be formed by a depression in the brickwork or by an iron $\frac{1}{2}$ in. fixed into the mortar joints. For recessed windows the rebate is in the interior side of the wall and in flush windows on the outside.

All wood window frames should be kept in good condition by repainting, periodical coats of paint to make them waterproof. Certain forms of metal frame are provided with small grooves or troughs in which the rainwater is caught, and this prevents it from collecting at the bottom of the window.

Properly constructed windows should not rattle. If the meeting rails are made such a width that the sash fastener on putting them tightly together, also pull them tightly to the putting heads the window sashes will not rattle. If, however, when the meeting rails are close together, there is a space of $\frac{1}{4}$ in. between the stile of the top sash and the line of the stile of the bottom sash and the putting heads only $\frac{1}{4}$ in. thick the window will shake considerably in the draught wind. On the other hand, if the stiles of the sashes are within $\frac{1}{4}$ in. of each other, the fastener will pull all tight together, and so, no matter how big the wind, the windows will be silent.

Window Cleaning. In most towns there are window cleaners who will do the windows of the whole house at a moderate charge, and who are usually called in at any rate for the less accessible ones. Those that can be done by the ordinary domestic staff should be cleaned on a full day, or at least when the sun is on the window, they should not be cleaned in cold or frosty weather. The materials required are a pail of clean warm water with a little paraffin in it, a wash leather or cloth for applying the water to the window, a soft cloth for drying, and a soft duster for polishing. Before starting, the frames should be brushed.

The water should be stirred over night. When all the water has been dried off with clean swamping movements the panes can be polished with the polishing cloth, and any smears left by the damp cloth removed. A little methylated spirit on the cloth will ensure a fine polish; the paraffin in the washing water is also excellent for this purpose, and it keeps the saw-ay. When no suitable cloth is available for polishing, a piece of clean newspaper rolled up into a loose pad makes an excellent substitute. Considerable labour is saved if instead of water, one of the liquid window-cleaning preparations sold under trade names is used. This liquid is applied to the glass with a clean cloth, allowed to dry on, then polished off with a soft dry cloth. See Bay Window, Glides; Burglar Alarm; Casement; Curtain; French Window; Glass; Lead Art Craft; Sash; Transom, etc.

WINDOW BOX. Plants may be grown upon the window sills of flats, town houses and other buildings by the use of window boxes. Such a box may be made of wood, about 1 in. thick, it should be the length of the sill upon which it is to stand, and about 1 in. wider. A depth of 9 in. is sufficient.

Ridges or runners of wood should be placed at each end in order that the box may not rest directly upon the sill. A few holes should be bored in the bottom and shallow tins or trays such as the lids of discarded biscuit boxes may be slid under the bottoms of the

boxes to catch any superfluous moisture. Before being placed in position, window boxes should be burned or charred inside so as to present a resisting surface to the decaying qualities of moisture.

A simple form of window box is made with 9 in. by $\frac{3}{4}$ in. boards cut out to the size of the sill and nailed together, with due allowance for the slope of the sill. The latter adjustment can be made by making the front board wider than the back one, or by fitting wedges underneath. If flower pots only are placed in the box there will be no need to do more than bore a few holes for drainage, but if the box is filled with soil the inside can be lined with sheet zinc. Metal flower boxes can be bought which are inexpensive and require no tinning, but such boxes are ugly unless it is intended completely to cover their outer sides with trailing creepers.

Preparation and Planting. In preparing the box to receive plants the bottom is first filled to a depth of about

1 in. with broken brick, cinder, or other material in order to form drainage. On this is placed a layer of turf or rough soil and the remaining space is filled with a compost of loam, leaf-mould and sand.

In the spring, geraniums may be planted to droop over the front of the box, or creeping penny, or candy creeper. Behind these, yellow or brown calceolarias, white daisies, or heliotropes. Lord Roberts may be

planted. Combinations of colour must be carefully thought out. White, yellow and bronze or mauve look well together, while pink geraniums will be charming with either tubular catenoid or mauve violas in front. Begonia Lloyd is most attractive, as it droops over the front of the box and has double flowers in yellow, scarlet or pink.

When the summer flowering subjects are over, the boxes should be cleaned out and refilled for the winter display, consisting of plan and variegated euonymus and other small evergreens.

WINDOW SEAT. A window seat generally takes the form of a flat board fitted to the shape of the window recess, supported on a suitable framework, and fitted with cushions or upholstered.

In a simple form of construction the seat board, measuring from 15 in. to 18 in. wide, is supported on two fillets screwed to the wall

with the aid of plugs at a height of about 10 in. The fillets should be at least 1 in. thick, and chamfered on the front and lower edges. If the recess is a long one, one or two bracket supports will be required for the seat, and in making them due allowance must be made for the skirting board as shown in Fig. 1. Having fitted the end fillets, as at A, from 2 in. by 1 in. wood, a length of similar wood B, which can be obtained machine planed, should be fitted between and secured to the wall, great care being taken that the back strip is exactly equal in thickness to the skirting; otherwise it will have a faulty appearance.

The brackets as shown in side elevation in Fig. 2 should be framed up from 2 in. by 1 in. wood on a back piece C, which should be the same height as the top of the fillets. The horizontal piece D forming the top of the bracket is dovetailed to the top of the back piece, as in the plan in Fig. 3, it should be cut

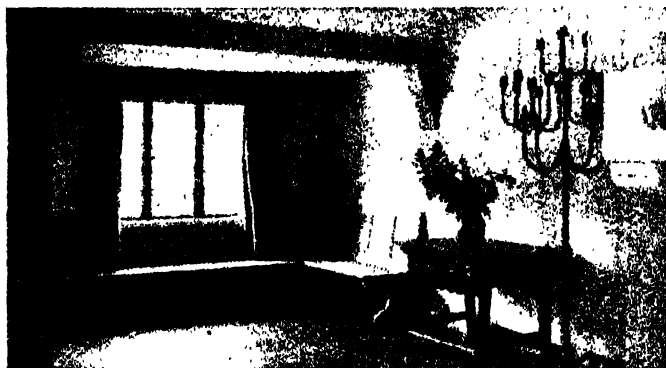


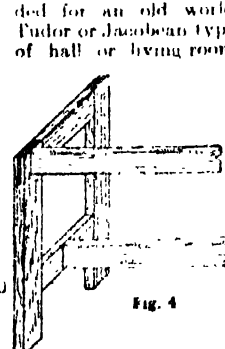
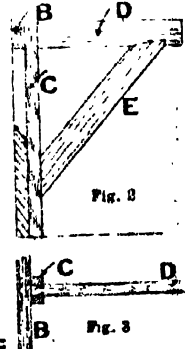
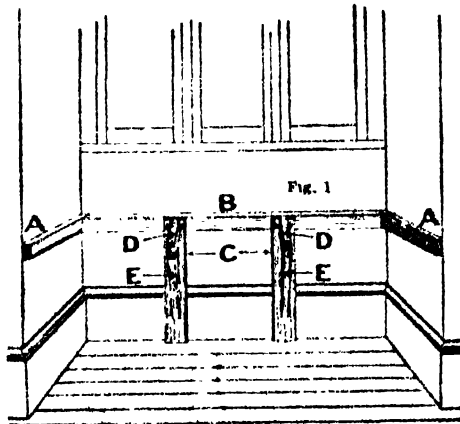
Fig. 5. In the old-world ban of a converted farmhouse a suitable window seat has been constructed with paneled back and solid shaped brackets.

Humphrey & Partners

to a length that will bring the end 1 in. from the front edge of the seat board. The strut is fitted as at E. The brackets are screwed to the back fillet, as in Fig. 4.

If it is not desired to make the seat a fixture a light frame work as in Fig. 1 can support the seat board, the wood used being at least 2 in. by 1 in. corners and rail can be jointed with the lapped halving joint or the frame morticed and tenoned. For long seats it is better to use 1½ in. square material, the joints being morticed and tenoned. To prevent the supports from moving one or two rails are tenoned into them and further secured by pinning or box wedging. The top board in all cases should be 1 in. thick, and as the width of the seat will be greater than the average width of the material, two lengths must be glued together. Information on seats of a similar type will be found in the articles in this work on Corner Seat and Ingle Nook.

A window seat intended for an old world Tudor or Jacobean type of hall or living room



Window Seat. Fig. 1. Recess ready for seat board. Fig. 2. Bracket. Fig. 3. Plan of bracket. Fig. 4. Light portable frame for seat board.

is effective when constructed of natural oak, wax polished and having a simple panelled back and solid shaped brackets, as shown in Fig. 5. Any form of upholstery would be out of place in such a setting, though one or two flat velvet cushions, edged with cord and trimmed with heavy tassels, would be permissible.

For a more up-to-date style the most convenient covering for a window seat is a fitted cushion, like the one illustrated in Fig. 6. Velvet has been selected as the fabric for the cushion in this case to match the upholstered

of the ordinary Windsor chair were made of beech or birch. The seat was made of elm which was cut up into rough planks. An adze was used for the hollowing process and the seat made smooth with a spokeshave. Each plank was then cut up into the required number of chair seats and each seat shaped with a band saw. A bit bored the holes that received the rungs. The pieces were allowed to dry before they were put together with glue.

These chairs were also made of yew, walnut, and cherry wood. Yew ones are very valuable, as age gives the wood a beautiful tortoiseshell colour and a fine patina. See Chair.

WINE. All wines possess a peculiar aroma or perfume which constitutes one of their most valued properties. The way to tell good wine is by its appearance, its smell, and its taste. Be the wine young or old, it should be clear and brilliant in colour, not dull or thick. It should be clean-smelling and of a pleasant aroma. Its taste should also be clean and pleasant.

Wines are often classified into natural and made, or manufactured and fortified wines, but these classifications are not absolute. The white and still wines of France, Germany and Italy are matured generally according to natural processes, and untouched thereafter. Made wines are all sparkling wines, such as champagnes,

which have added a liquid composed of fine wine-brandy and sugar.

Port and sherry are very often fortified by an addition of alcohol, but the finest vintage port is a natural wine free from added alcohol, thereby enabling the wine to keep and rendering it wholesome. Well-made wine improves with age. Port or sherry will last for 80 or 90 years or more, a good burgundy or claret for 40 or even 50 years. Champagne is at its best at from 12 to 15 years after bottling.

The Wine Cellar. It is the acclimation of every lover of wine to keep a wine cellar. It need not be an elaborate affair. A good sized cupboard will do, provided it is dry or any underground cellar that has not outside walls. The temperature should be from 52° to 58° F., and this can be obtained by means of a gas jet. The great thing is to keep the temperature uniform.

Bins made of iron and wood in two dozen units for holding the bottles can be obtained. The bottles should be placed in the bin on their sides and, once binned, should be left undisturbed until required. On port bottles is a splash mark, and the bottle should be binned with this mark uppermost. Sparkling wines soon become flat if they are stood on end.

Decanting of Wine. Great care should be taken in decanting old wines, especially old vintage wines. First of all, the sealing wax should be

removed carefully. Then a brush should be used to remove any dust, wax, or cork. A good corkscrew is necessary. For difficult corks a double-liner extractor is useful. When drawing a cork a guard should always be used consisting of a piece of cloth or a leather guard which is slipped over the neck of the bottle. In the case of old wines, it is wise to decant through a decanting funnel or a piece of muslin. If a funnel is used, it should be warmed to the temperature of the wine.

When opening champagne, the wire and string should be entirely removed before uncorking. The wine may be spoilt easily if poured out over string and rusty wire. Do not put more than one bottle of wine into a decanter. Each bottle of wine has its own character and individuality. Do not decant more wine than you think will be consumed.

Temperature for Serving. As for the temperature, white wines should be a few degrees colder than the room, and in hot weather full-bodied wines may even be iced. Red wines, on the other hand, should have had time to take the temperature of the room, a matter of two or three hours, and there is no objection to their being a degree or two above it. But it must be remembered that if wine is at too high a temperature all its finer qualities will disappear, and the particles which it gives off will be so loaded with alcohol that perfume, bouquet, and aroma will become indistinguishable. The wine glass should be as thin as possible so that the wine may be affected by the heat of the hand without delay, and it should be of a bulging shape with its opening smaller than its body, so that the perfumed particles given off by the wine may be inhaled, as it were, concentrated through a funnel.

At small, informal dinner parties it is now usually the practice to serve only one or two wines throughout—claret, burgundy, or champagne. But at big dinner parties and banquets there is a recognized order, as follows: With oysters, graves or chablis; with soup, sherry, marsala, or madeira; with fish, a glass of sauternes or chablis; with the entree and roast, claret or burgundy; with game, champagne; with pastry, madeira; with cheese and fruit, port should be served. See Burgundy; Champagne; Dinner; Port Wine; Sherry, etc.

WINE BISCUIT. To make, sift 8 oz. fine flour with a pinch of salt, then rub in 2 oz. butter, add the same amount of castor sugar, and make all up into a dough with 1 small egg and about 1 tablespoonful cream. Add to the dough, mixing in lightly 2 oz. currants (cleaned and picked) or ½ oz. caraway seeds. Lay aside for 1 hour to stiffen the dough. Cut it into shape with a blunt cutter and bake it on a greased and floured baking tin in a moderate oven.

WINE COOLER. This article, now mainly valued as an antique, developed from the tub or vat in which bottles of wine were placed for cooling. It was also known as the ice pail. These coolers or pails are often found in pairs, and the fact that their usual place was beneath the centre of the sideboard was not without influence on the design of that piece of furniture.

Silver bowls were used for cooling wine in Italy in the 16th century and something of the kind was used in England in the 17th, but the best examples, both in silver and in Sheffield plate, date from the 18th. Pieces were made in the



Window seat, Fig. 6. The most convenient way of furnishing a window seat in a modern living-room is with a long fitted cushion and two fancy cushions to suit the general colour scheme.

Humphrey & Vera Joel

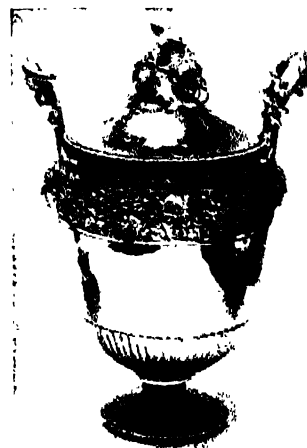
chairs, but tapestry, damask, printed linens, cretonne or chintz would all be equally suitable in correct relation to the curtains and chairs of the particular room. See Bay Window.

WINDSOR CHAIR. This type of chair, a real English production, was first made in the 17th century, and good examples are much valued. The characteristic features are the hollowed wooden seat and the complete separation between the uprights forming the back and those forming the legs. The method of putting it together also was new. This was the boring of circular holes by means of a bit, and the fitting in of cylindrical spars, fastened by wedges and glue.

In the oldest form, the backs are composed of simple turned spindles, or spars, that run into a curved top rail. The arms are continuations of the back centre rail. Another type has a stretcher back in the form of a V. This is fixed by two extra spindles fitted in the back for additional strength. These are put in behind the others, which they cross transversely, and are fixed in a tailpiece to the seat.

The fiddle splat back type was seen early in the 18th century, the splat probably having been copied from that in the ordinary Queen Anne chair. In these cabriole front legs are often seen and they possess stretchers. About 1750 the Windsor chair with an arch back was made. In this the cabriole leg is used, and the front stretcher is curved away towards the back legs, being connected therewith by two turned stretchers. The back is in the form of an arch and is usually supported by six spars with a centre splat laid on, which may or may not be pierced. The arms are often horseshoe in shape.

A variation of the splat in the arch back is the wheel back. The centre has a circular pierced ornament in the form of a wheel made by fretting out six triangular holes. The legs



Wine cooler. Antique silver wine cooler having a lid with a knob formed of vine leaves. Period of George III.

shape of an urn or vase, and some of them are remarkably graceful in design. Some are provided with a lid and others with a handle or both lid and handles, but there are examples without either.

In some cases ring handles have lion mask supports and lie flat to the sides; in others, as in the one here illustrated, the handles are high and ornamented with twisted snakes or with vine branches. Bases were square, round or oval, and some of the earlier examples were on scrolled feet.

Probably the finest existing examples are those copied from the Warwick vase. One beautiful specimen stands on a square base and is decorated with lead edging and acanthus leaves on the body and a band of leaves round the top and along the sides of the base. See Sheffield Plate; Sideboard.

WINE GLASS. Convention has decreed that each wine shall have its particular pattern of glass. Claret glasses should have the sides sloping slightly outward and should hold about a third of a pint. For burgundy the glass should be slightly bevel shaped on a short stem; it should hold nearly half a pint.

Certain white wines, such as chablis and sauternes, should be drunk from glasses of the ordinary goblet shape with straight sides. The champagne glass had a very wide, shallow bowl, the idea being that this keeps the wine fresh by retaining its effervescence; modern champagne glasses are often unconventional in shape, the same type being used for hock or fiaselle. These glasses are sometimes gilded at the rims, decorated with black or coloured stems, or made in delicate colours with cut stems. Sherry glasses are tall and pyramidal in shape, and port is usually drunk from a somewhat smaller glass shaped like a cup. See Glass Ware.

WINKLE. The winkle or periwinkle is a small shellfish which has little food value. The horny excrescence which surmounts the head should always be removed. Winkles are usually eaten with vinegar and seasoning and accompanied by bread and butter. See Shellfish.

WINTER: In the Garden. Winter is chiefly a period for repairing past errors and planning new schemes in the garden. Dead stems, leaves, and all sorts of rubbish may be cleared away and burned, but it is always desirable to establish the identity of each plant before removing the top hamper, otherwise the label may be lost, or illegible, and doubt may arise in the future.

Roses and fruit trees may be planted when the weather is open, and other operations carried out according to the calendar for the various months of the season.

Quite a number of shrubs and plants are in full beauty during the winter months. The yellow winter jasmine is charming on a house wall or fence, and the pink buds and white flowers of the evergreen laurustinus are cheerful. The Chinese yellow hazel (*Hamamelis mollis*) bears fragrant yellow blooms in mid-winter and the heather named *Erica Darleyensis* is also in flower. The spring heather (*Erica carnea*) shows colour early in the new year, and on a sunny wall the old red *Pyrus japonica* and the fragrant winter sweet (*Calycanthus*) then begin to flower. The earliest and best of the Christmas roses (*Helleborus altifolius*), the winter-flowering *Iris stylosa*, stray blooms from the winter-flowering pansies and poppy anemones, snowdrop and winter aconite—all these help to invigilate the garden with interest in the depth of winter. Then also the trees and shrubs grown for the sake of their coloured bark or showy fruits are in full beauty.

Systematic gardeners will prepare and map out on paper new plans for beds and borders to be established in the spring, or note

corrections to be made in doubtful blendings of heights or colours. See Autumn; December; January; Spring.

WINTER ACONITE. This is a charming low-growing, spring-flowering plant, one of the first to flower in the new year. The yellow blooms surrounded by a ruff of green are on stalks about 2 in. high. It looks well in grass, or may be set among shrubs where it will spread and provide a carpet of colour early in the year. The bulbs should be set 2 or 3 in. deep in August and September. The botanical name of the common kind of winter aconite is *Eranthis hibernica*.

WINTER CHERRY. A small shrub, *Solanum capense*, is grown in Great Britain as a pot plant for winter decoration indoors. Height is up to about two feet, though those sold in full berry by nurserymen are generally about half that height. The leaves are small, and lance-shaped. The small white flowers are succeeded by orange-red cherry-like berries. It needs the protection of a greenhouse, or a warm room, from September to June. See *Solanum*.

WINTER GARDEN. In the ordinary acceptance of the term this is simply an elaborate and large conservatory attached to a house, with sufficient space for indoor beds and borders, and roof room of an altitude that will accommodate the loftiest palms. The winter garden is usually heated by hot water pipes, and is often utilized as an after-dinner lounge. An outdoor winter garden suitably arranged would include such flowering shrubs as winter sweet, winter-flowering jasmine, heaths, dogwood, hamamelis, laurustinus and the earliest bulbs. See Conservatory; Dogwood; Lounge.

WINTER GREEN: The Plant. Two useful evergreen shrubs are known by the name of winter green—*Gaultheria shallon* and green procumbens. The former grows 2 to 3 ft. high, bears bluish-coloured flowers in spring and purplish-black fruits in autumn; it is often planted as an undergrowth beneath trees. The partridge berry (*Gaultheria procumbens*) is a creeping shrub suitable for planting in shade; it has white flowers and red berries, the latter provide the winter green oil used in the treatment of rheumatism. Propagation is by seeds and cuttings.

Oil of winter green consists mainly of methyl salicylate, and has the same effects on rheumatism as other salicylates. It is chiefly used as an external application.

WINTER GREENS. In the vegetable garden it is very important to provide for winter use a supply of green stuff or winter greens, such as cabbages, Brussels sprouts, broccolis, kale, savoy, and sprouting broccolis. To avoid any glut, sowings should be made in small lots in March and April. A fresh sowing can be made when plants sown previously are just showing through the soil, thus providing plants which will mature in succession instead of all coming to harvest at one time. As a rule amateurs will not sow in this way, and consequently huge quantities of green vegetables either rot or run to seed every winter. See Brussels Sprouts; Kitchen Garden, etc.

WINTER JASMINE. This charming hardy winter-flowering, climbing shrub of slender growth is suitable for training on a house wall, fence or trellis. It flourishes in ordinary soil, and should be pruned as soon as the flowers have faded. The flowers of the winter jasmine are yellow and open well in water, if sprays bearing buds are cut and brought indoors. See Jasmine.

WINTER MOTH. One of the worst pests of fruit trees is the winter moth, its caterpillars devouring leaves and blossom. Grease banding in autumn is necessary to trap the wingless females, which crawl up the stems of trees to deposit their eggs in crevices of branches and shoots, these hatching out into destructive larvae as buds begin to burst. In addition to grease-banding, trees may be sprayed with a tar-oil wash in winter and the poisonous arsenate of lead wash as soon as the fruits are set. See Grease; Spraying.



Winter moth, the caterpillars of which destroy the leaves and blossom of fruit trees

WIRE: Its Uses. Wire can be obtained in many different shapes and sizes, and is produced commercially by means of powerful machinery which draws the heated metal through a series of holes of gradually diminishing size in a metal plate. Wire is employed for innumerable purposes in the home. It can be used for binding and repairing, for clothes lines, for supports for flowers in the garden or in pots and for hanging pictures and curtains. It can be kept straight for the latter purpose by using wire strainers, and it is also obtainable in coiled spiral form for the same purpose. It is made up in the form of nails, pins, hooks, staples, and tacks. Wire is found in the form of gauze, netting, fencing and is also made up into many household utensils.

In the Garden. Wire is useful for supporting climbing plants and trained fruit trees, and for binding joints or pergolas and arches. Ordinary wire is liable, however, to become sun-hot during summer, scorching shoots and tender growth. In high winds, too, it is apt to tear tendrils and young branches. Multi-stranded wire with a composition covering is best suited for garden use.

Wire Gauges. Gauges for measuring the thickness of wire are made in several shapes and there are a number of different systems employed in measuring. The thickness of the wire is denoted by numbers, except in the case of the Lancashire steel wire gauge, in which letters are used. In most gauges the lowest number indicates the thickest wire, but in the Whitworth gauge the reverse is the case. The Whitworth gauge ranges from 5 in. (No. 500) to 0.001 in. (No. 1), and it has the advantage that the number of the gauge is a key to the dimension. In the other gauges in ordinary use the number is no indication of the size of the wire. The British imperial standard gauge, indicated by the letters S.W.G., is the English legal standard for measurement, and its graduations extend from 7/16 in. to 36 in. (0.076 in.), and include 43 numbers. The Birmingham wire gauge is still in general use, and many wires are quoted as B.W.G. Its numbers range from 0.004 in. to 18, and with slight differences in the



Winter Jasmine. A beautiful winter-flowering shrub

second and third decimal point from 19 to 36. Wire from the United States is measured by the Brown and Sharpe (B.&S.W.G.) Disk gauge is generally used, being more convenient than those of oblong shape. See Fence; Gauge; Micrometer.

WIRELESS RECEPTION FOR HOME PURPOSES

Types of Service Available in this Universal Entertainment

The component apparatus are severally dealt with in this work under numerous specific headings, e.g. Valve, and the complete receiver is discussed in detail under Broadcast Receiving Sets, Portable, Superheterodyne, Television etc. Other contributions describe the accessories, e.g. Accumulator; Rectifier. See also High Tension; Reaction; Selectivity

The sources of entertainment and instruction available through the medium of a wireless set can be divided into four groups: 1. Speech and music broadcast on medium and long waves by the British Broadcasting Corporation and other European broadcasting organisations. 2. Speech and music transmitted by short-wave stations, most of which are designed to disseminate advertising or propaganda to other countries. 3. Television (sound and

normally be exceeded even with a very sensitive set.

The so-called radio-gramophone is fitted with a turn-table so that gramophone records can be played electrically through the loud speaker; alternatively, separate "playing units" are made for coupling to sets equipped with "pick up" terminals. In choosing a set from catalogue descriptions it should be remembered that the term "radiogram" (an abbreviation of radio-gramophone) is often somewhat loosely used, and it may be applied to a set that is not in fact a complete combination of radio receiving set and electric gramophone but one which requires the addition of the independent turntable and pick-up unit before records can be played. Complete all-electric types of radio-gramophones are

either an eyesore or an attractive asset in the furnishing of a room. Listeners often tend to look at a set while they are listening, even when it has no television screen on it. Therefore, a wireless set can well be the most looked-at object in a room, and so a wide variety of makes and models is now available.

Potential buyers of wireless sets should bear another point in mind: a set ought not to possess a "tone" of its own. To say of any particular instrument that it has a "nice tone" is tacitly to ascribe to it the introduction of false sound values. Actually, the highest compliment which can be paid to a set is that in fact it has no tone of its own, but that it reproduces speech and music with fidelity. The nearer the approach to a faithful reconstruction of the original sound values as created in the broadcasting studio, the nearer to perfection does the instrument go towards perfection in quality of reproduction.

Obviously, one fundamental factor cannot be re-created under domestic conditions; the full volume of the original sounds cannot comfortably be reproduced. The listener does not in fact want the equivalent of, for example, a full-sized brass band playing in his parlour! Nevertheless, a balance of tone is maintained at lower volumes by an efficient receiver.

The size of room in which a receiver is to be used need not therefore affect its choice to any considerable extent so long as there is an ample reserve of power; but a set having a fairly large power output is as much to be desired in a small room as in a large one. Not because the ability to emit sounds at a considerable volume is necessarily desired, but "peaks" occur even in "quiet" levels of volume which can be handled without distortion only when there is a comparatively large output maximum.

A certain amount of distortion is inevitable in wireless reception. Generally speaking, it is only from the National and Regional B.B.C. stations serving a particular area that the highest quality can be obtained on any set with the minimum of interference. For this reason there is a tendency for many listeners to confine their listening to their "local" stations after the novelty of

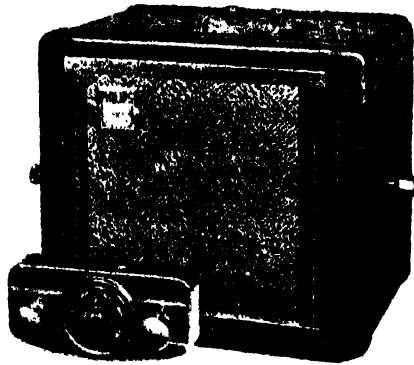


Fig. 1. Car Radio. Philips 4-valve superhet MotoRadio. Built-in speaker; new type control head, for instrument panel or steering column mounting shown inset

vision) transmitted on ultra short waves from the London and provincial stations, the ranges of which are strictly limited. 4. Records electrically reproduced (in the case of a "radio gramophone").

For practical purposes, reception of medium and long wavelength broadcasting, which comprises the domestic mechanism of the broadcasting services of all countries, is restricted in this country to the stations situated in Europe. Of these, only the nearer and more powerful ones can be heard in daylight. At night many more become audible since darkness extends their ranges.

The short waves (q.v.) are not normally used to provide local or national services, but are employed for programmes intended to be received in other countries. Short wave stations are able to cover great distances using relatively low power, and it is possible with these to receive programmes originating in America, Australia, and other distant continents when conditions are favourable. Turbulent conditions of the ether are liable to cause interference and fading and, therefore, short waves cannot give a completely consistent service, even when compensating systems of automatic volume control are used.

Listeners who have not experienced reception on these bands should bear in mind that commercial advertising and political propaganda prominently figure in a large proportion of the short-wave programmes from other countries. For a time they may find this an interesting novelty, but ultimately it often tends to become somewhat irritating, in many cases. Sponsored or commercial broadcasting is at present forbidden from British transmitting stations.

Programmes in vision and sound (television) are sent out on ultra short wavelengths (approximately six metres). These ultra short television waves are receivable only over a limited range. Seventy miles represents an average limit of reception, and this cannot

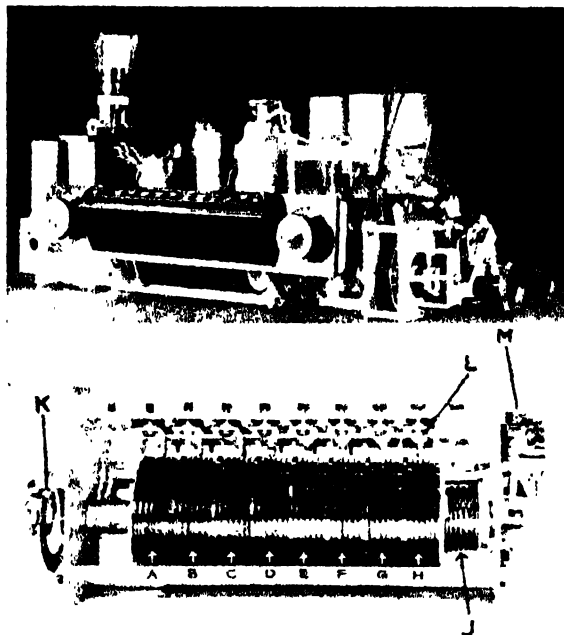


Fig. 2. Motor-driven automatic tuning system, designed and built as integral part of receiver, on chassis of Philips Model 753. Fig. 3 (lower illustration), back view of selector drum assembly of Philips Press-Button Tuning Mechanism. A-H, individual drums; J, friction clutch spring; K, flexible drive coupling; L, sawing guide arm; M, motor switch forward and reverse contacts

usually though not invariably fitted with electrically driven turntables. Clockwork drives are sometimes found on the cheaper models and necessarily in sets designed for battery operation (see Gramophone).

It is advisable always to test a radio-gramophone for the direct emission of sound from its pick-up. This is heard at its worst when the lid has to remain open while the record is being played. A substantial close fitting and preferably felt lined lid is needed for its complete suppression.

Buying a Set. In deciding exactly what type of set to buy the main consideration is obviously its performance. Almost equally important is its appearance. A radio set is a piece of furniture, and can be

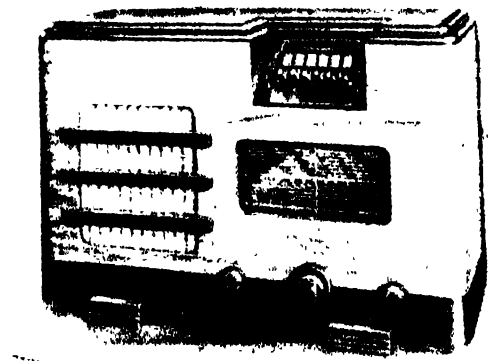


Fig. 4. "Push-Button Control" as it appears from the outside, on a Cuscor A.C. Mains Model (398) with "De Mougé" Interference Suppression Circuit. Note simplicity of controls and of the calibrated station-log

listening to distant stations has worn off. Nevertheless, that a sensitive modern set can pick up distant programmes is indisputably an advantage. Fading can be overcome to a considerable extent by Automatic Volume Control although there is yet no successful method of combating interference from atmospheres.

Electrical interference is even more serious, as it is liable to intrude on the reception of local stations. It may be caused by domestic electrical appliances, lifts, machinery, electric signs and many other such things. When it reaches a radio set through the mains, a suitable suppressor device connected to the power point serving the instrument may be effective. Electrical interference which arrives through the ether is much more difficult to deal with.

However, special forms of "anti-interference" aërials are obtainable and these sometimes prove completely effective.

Tuning. Probably the greatest advances in radio receiver design during the past few years are to be seen in the controls. Whereas the earlier sets had to be tuned by means of dials calibrated in degrees, the modern set has its dial marked with both wavelengths and station names, thus enabling anyone with out any technical knowledge whatever to select the required programme. The operation has been still further simplified by "push-button" tuning. With this method any one of a pre-selected number of stations is selected merely by pressing a marked button.

Push-Button Tuning

There are two systems employed. In the one an electric motor drives the tuning condenser round to a point determined by the particular button pressed. In the other a number of small condensers are each initially adjusted to each value as with tune the contents of the set to the required series of wavelengths. The push-buttons with which the programmes are selected switch the required condensers in circuit. It is important that tuning should be exact in the case of a set employing the super-heterodyne principle. Any deviation from this exact tuning is liable to introduce distortion. To ensure exact tuning some of the more expensive sets include in their circuits a system of automatic tuning which "pulls" the tuning into precise harmony. In a station has been brought up to a certain maximum of volume by the listener. There are also various forms of visual tuning indicators to point out precision of tuning. Extensive aerial systems are not needed with modern radio receivers. In fact, a long aerial may often be a disadvantage in that it will be more sensitive to electrical interference. A good earth connection is frequently desirable.

Car Radio. Owing to the fact that many cars are manufactured with all metal bodies, it is not only necessary to position the aerial outside the body of the car. It can sometimes be run along the underside of the running boards. Alternatively, it can be mounted outside the roof. If the set is to be operated while the engine is running all the wiring in the ignition system may have to be encased in metal tubing, and, in any event, "suppressors" usually have to be fitted to the plugs. The set itself is normally built into or behind the dashboard, the controls being connected to the set with flexible cables, can be fixed to the steering wheel if desired.

Wireless Licence. A licence costing 20 shillings per year must be obtained before a wireless receiving set of any kind can be used in Great Britain. Licences can be purchased at any Post Office, and each one will cover the use of a stationary set in the house and a portable receiver used by the licensee or any other person living on his premises. A separate licence must be purchased for each car radio.

WIRE NETTING: Its Uses. Galvanized wire netting is useful for a variety of purposes.

It is obtainable in rolls of 50 ft. length in widths from 1 ft. to 6 ft., increasing by 6 in., and with meshes varying from $\frac{1}{2}$ in., increasing by $\frac{1}{4}$ in. to $\frac{3}{4}$ in. to 1 $\frac{1}{2}$ in., with additional sizes of 1 $\frac{1}{2}$ in., 2 in., 3 in., and 4 in. In the large mesh the selvages are 3-ply, otherwise it is usual to have 2-ply twisted selvages. Netting of 3 and 4 in. mesh can be obtained in widths of 3 ft., 3 ft. 6 in., and 4 ft., with a 3-ply twisted selvage at the top and bottom and a 3-ply strand woven in the centre. Mixed mesh wire netting is made up of two widths laced together and afterwards galvanized.

The gauge of the wire used in the netting depends on the size of the mesh; except the smallest mesh, which is generally No. 21, all sizes can be obtained in several gauges. The best quality should always be purchased.

In securing wire netting to framing, it is generally advisable to fasten one of the selvage edges first, straining it as tightly as possible. The opposite edge is similarly secured, leaving the ends to be neatly turned in and secured at frequent intervals.

In using wire netting for fencing, it can be attached to stakes of wood or iron, the latter being generally more convenient and lasting. Stakes should be placed at intervals of from 6 ft. to 9 ft. apart. Wooden stakes should be soaked for preservation, pointed, and entirely cross-cut, felling the cut wood should be coated with tar and the exposed portion treated with a wood preservative. Sawn stakes, unless of stout material, are liable to snap. Iron stakes of circular section are obtainable provided with an extra prong for fixing in the ground. They are made in several lengths, giving a height above ground ranging from 18 in. by 6 in. to 6 ft. and 7 ft., with thicknesses varying from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. diameter. For strong fences 1 in. angle iron is obtainable in lengths of 4 ft. or 4 ft. 6 in., and 5 ft., with riveted plate for pressing into the ground with the foot, and a hook top and bottom for holding the netting in position. See *Aviary; Chicken; Fence; Poultry; Tennis Court*, etc.

WIREWORM. This word is employed somewhat loosely for pests that attack crops. True wireworms, however, are the young of certain species of the click beetle, and are easily distinguished by their yellow colouring. They are common and very widely distributed.

To combat this pest the following hints are given in a leaflet issued by the Ministry of Agriculture. If it is not desired to use a proprietary compound, experiments may be made in the use of naphthalene alone. This substance in the crude or semi-refined form can be obtained from gas-works or makers of insecticides. The naphthalene in powder, at the rate of from 1 to 2 oz. per sq. yd., should be worked into the soil as thoroughly as possible, and its effects seem to be much greater if the application is followed by a heavy rainfall or drenching by artificial means.

If the land is not badly infested, or if soil insecticides are considered unsatisfactory, wireworms may be either trapped or dealt with by poisoned baits. In the former case pieces of potato, beet, or carrot should be spitted on short sticks, buried in the ground,

and examined every few days. If it is desired to poison the wireworms, the slices of root, or preferably small pieces of rape cake, may be dipped in a mixture of Paris green in water (1 oz. in 2 gallons) and then buried.

The adult beetles may be trapped in spring and summer by means of small heaps of cut clover, sainfoin, or broken rape cake covered with a tile. See *Insecticide; Tomato*.

WIRING DIAGRAM.

This piece of mechanism is a pictorial or practical representation of the connections to the various component parts of a circuit, as distinct from a circuit diagram, which latter is simply a theoretical conception. In wireless the wiring diagram may take the form of a blue print, or alternatively a black and white drawing to scale, the panel and backboard usually being shown in plan and the components in their correct relative positions. The circuit connections are then indicated by means of lines joining the terminals on the various components. See *Circuit Diagram*.

WISTARIA.

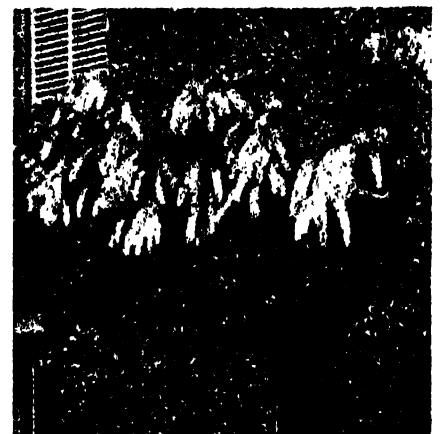
This is one of the most beautiful of all hardy climbing plants. It is seen to the best advantage on an arched or pergola, though it may be planted against a wall; it is very striking when trained on a crenelated trellis in the open garden. This shrub thrives on ordinary soil; it is rather slow growing for the first year or two. The way to prune is to allow sufficient shoots to develop to form the main branches and to shorten the side shoots in summer and again in winter to ensure the development of blossom buds.

The common kind is *Wistaria sinensis*. One with longer flower bunches is *Wistaria multi-flora*; this provides a remarkable display when trained on a pergola. Both have blue mauve blooms in early summer. The white variety of *multi-flora* is particularly beautiful. *Wistaria* grown in pots can be forced into bloom in the greenhouse in spring. See *Climbing Plant; Japanese Garden; Roof Garden*.

WITCH HAZEL. This is the popular name of a group of leaf losing, autumn, winter and spring flowering shrubs of which the botanical name is *Hamamelis*. They are slow



Wireworm. Above, larvae of the click beetle. Below, adult beetle.



Wistaria. Beautiful drooping racemes of the species *multi-flora*, one of the most valuable of all climbing shrubs. See article above.

growing but eventually form large bushes. Ordinary soil suits them, and they need very little pruning; it is necessary merely to thin them out occasionally. The best is *Hama-melia mollis*, which bears fragrant pale yellow flowers in mid-winter; *arborescens* has deep yellow flowers in February and *virginica* bears pale yellow blooms in late autumn. They are most interesting and easily managed hardy shrubs. Layering is the best method of propagation.

Medicinal Uses. Witch hazel is an active haemostatic much used for controlling bleeding. A few drops of the liquid extract in water snuffed up the nose is an excellent treatment for nose bleeding. Hamamelis, on account of its astringent action, is a useful home remedy for haemorrhoids.

WOLF. The fur of the wolf is longer and coarser than fox, but it is also cheaper. The wool is soft and very liable to felt, but on the whole wolf wears fairly well and is less fragile than many of the more expensive pelts. The colour varies from yellowish grey to blue, but some skins are so dark that they almost appear to be black. The general directions given for the care of long haired furs may be applied to wolf. See Fur.

WOLFHOUND. The three varieties of this dog that are most usually seen in Great Britain are the Alsatian, the Irish and the Borzoi. See Alsatian, Borzoi, Dog, Irish Wolfhound, Kennel, etc.

WOLFSPINE. The fur known as wolfs-pine is obtained from the carcass of skunk-bear. It is soft and thick, and of a dark brown colour, a whole skin usually measuring 3 to 4 ft. in length. A patch of dark fur in the centre of the back is known as the saddle. Around it there is a band of lighter fur and then another dark ring; the latter is not quite so dark, however, as the saddle, which resembles fine sable fur, and is usually cut out and used for the same purposes. After the saddle has been removed, the gap is filled with bearskin, and the whole used for rug-making.

WOOD. Wood as used by the cabinet maker and the woodworker in general is the seasoned product of the timber tree, and as such is divided into two classes, softwood and hard woods. It is usual to describe as softwoods those obtained from trees bearing needle-pointed leaves, and to classify as hardwoods those from trees bearing broad leaves. Only a very small quantity of the wood used in this country is home grown, the main supplies come from all parts of the world, generally cut into recognized sizes and partly seasoned.

The principle varieties of timber are dealt with in this work under specific headings. Other information is given under such headings as Grain; Timber, etc. Surface treatment is described in Paint, Stain; and Varnish.

The most commonly used wood is known as deal, but this is the name of the size into which several varieties of pine or fir are cut. Under the one species of pine there are several entirely different woods, ranging from one of the softest to one of the hardest. The same difference is found among the hardwoods; for example, lime is soft and even textured, and *lignum vitae* is exceedingly hard and difficult to work.

The matter of shrinkage is of importance in all forms of cabinet making, and it can be taken as a general rule that the softer the wood the more liable it is to shrink. There are other faults which generally go with a liability to excessive shrinkage. Among them are shakes. These are splits in the direction of the grain at right and other angles to the annual rings as well as along the line of the rings, the latter being known as cup shakes. The pines are liable to knots, and it is rarely possible to obtain a board of yellow deal without knots, but if they are only small it does

not matter very much. Large knots, however, are liable to fall out, especially in thin boards.

The difference between heartwood and sap wood can generally be noted by a difference in colour and in the brilliancy of the planed wood. The heartwood is the fully developed portion of the tree, and the sapwood is only partly lignified. Satin walnut is a case in point for the tree produces very wide sapwood, which is imported under the name of hazel pine. The heartwood of yellow deal is of a bright golden colour and has a distinct lustre, while the sapwood is of a bluish shade and planes up to a rough spongy surface.

Timber for Carpentry. The timbers used for carpentry are mostly softwoods, such as red deal, white deal or spruce, and red or yellow pine. Red deal is in general use for window frames, cold frames, doors, and similar outside work which is to be finished by painting. White deal is used principally for flooring boards, tongued and grooved partition work and common inside fixings, such as shelving. The better type of work, such as table top, the ends of cupboards, panels, etc., calls for a medium quality of yellow pine. Tongued and grooved matchboarding and flooring boards are sold by the square, a square being nominally 100 sq. ft., but smaller quantities may be purchased at per sq. yd. White deal shelving, machine planed on both sides and both edges, can be obtained in varying widths from 9 to 11 in. wide at per foot super.

There is a large variety of ready-made mouldings for picture rails, but and coat rails, cornices, sash bars and skatings; these are obtainable at the rate of per 100 ft. For small quantities of mixed woods, such as maple, oak, walnut and ebony, the amateur is advised to purchase what are called cuttings at the local manufacturing cabinet shop. Some kinds of wood are obtainable in wider widths than others. For example, oak is not generally obtainable in wider widths than 11 in. and averages 8 in. wide, satin walnut averages 9 in., but can be obtained 14 in. wide. Black walnut averages 7 in., and is obtainable up to 11 in., while American whitewood and mahogany, with an average width of 10 in., are available up to 3 and 24 in. wide. Yellow deal does not run more than 11 in., but Oregon pine is easily obtainable in widths up to 24 in. It does not follow, however, that the wider widths are more suitable for all wide work, for it is often an advantage to glue up several narrow widths as they are then much less liable to warp.

Colour and Grain. The colour of the wood is another consideration in the choice of wood, and in this respect there is great variety. A choice can be made from the almost pure white woods such as sycamore, spruce, and holly, to the black of ebony. Yellow woods are numerous in both soft and hard varieties, e.g., yellow deal and boxwood. Red woods include red pine, sequoia, radonk, mahogany, and rosewood. Brown woods are obtainable in the form of satin walnut, chestnut, and snake-wood, while walnut is of a purplish tint.

In addition to the actual colour of the wood, the peculiarities of the grain enter into considerations of choice, not only the distinguishing grain of the wood, but the accidental variations and malformations. As a rule, any wood cut parallel with the diameter is even in grain and when there is a difference between spring and autumn growth, as exemplified in yellow deal, this contrast of colour can be accentuated by cutting the wood at various angles. The commonest example of the cross grain cutting of wood is seen in the silver grain of oak, which owes its effect to the method of sawing the wood diagonally to the medullary rays, the line of hard cells which radiate from the centre of the tree.

The hair effect in such woods as walnut, amboyna, and thuya is produced by the growth of small branches on the lower portion of the trunk, which do not pierce the bark. A type of figuring known as the curl is caused by the natural flow of the grain, which originates at the commonest growth of a branch. The grain effect in the polished oak and other woods, as well as in birdseye maple, is due to malformation in the former case it is due to a long-term growth and also by cutting the branches close to the trunk, and in the latter to the curves of a boring insect. It will be seen, then, that the figuring of wood is due either to the method of conversion, which is often wasteful, or to malformations, which are rare.

Surface Treatment. Owing to the comparatively porous nature of the grain, the untreated surface of wood is liable to decay, especially when exposed to damp. External structural work should be painted or coated with a wood preservative, and all internal woodwork, when not treated in this way, should be kept dry and surrounded with a current of air. See Colour, Finishes, and Paints.

Wood Ash. See Fertilizers.

Woodbine. See Honeysuckle.

WOOD CARVING: PRINCIPLES AND PRACTICE

With Some Beautiful Examples of this Decorative Work

The amateur, whether man or woman, will find much scope in this fine craft for manual development. Satisfaction, expression, while it can be carried out with an expensive equipment, further assistance can be obtained from pursuing such courses as Gouge, Grindstone, etc. Tools, Wood, etc. See also Chip Carving.

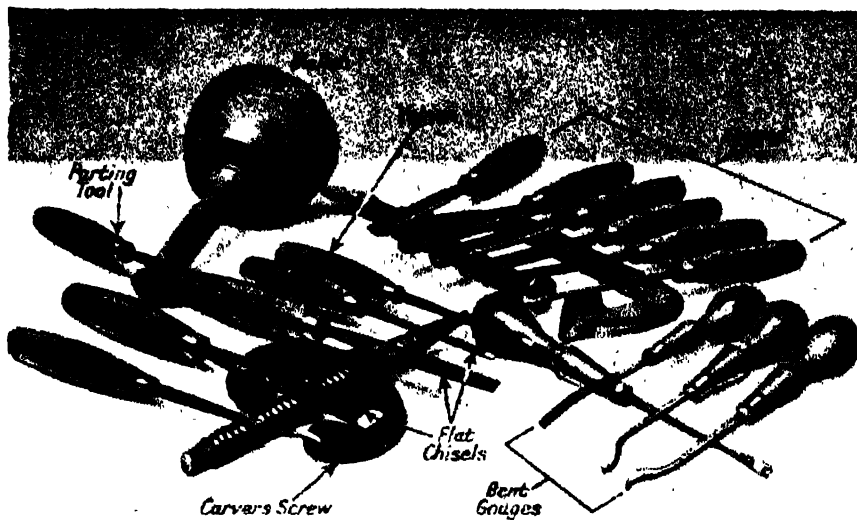
Wood carving is the one branch of sculpture that the amateur craftsman can follow with little expense and considerable chance of success. It is not, however, generally considered as an end in itself, but as a means of decorating wood. Chip carving is a simple method of decoration. In this article the methods of dealing with carving in the round or in high relief from the simplest beginnings will be dealt with.

The beginner will be well advised to purchase tools as they are required, and, although most of the tools illustrated at Fig. 1 are essential for advanced work, there is no need to purchase them all at once. Much preliminary practice can be obtained by the use of a timber gouge and a veiner, and with the former tool a series of cuts should be made on a piece of even grained wood, as shown at Fig. 2. It does not matter very much what the size is, anything from $\frac{1}{2}$ in. to $\frac{1}{4}$ in. will do, but lines should be made on the wood as a guide before

the cutting is commenced by the worker. The simplest cuts are made by pressing the gouge into the wood in a vertical position. The gouge is now set back $\frac{1}{2}$ in. and inclined slightly backward, thus having the effect of removing a chip of wood of segmental shape. This is followed by a similar commencing cut a little farther back, with the distance of the second cut increased. Several cuts should be made thus, each time increasing the distance until it is possible to scoop out a space of 1 in. long up to the first vertical cut taken.

On slowly turning the gouge round on its own curve, a circular cut can be made and when this is accomplished the scooped cuts can be made each side, as at A and B, Fig. 2. A pattern combining the first and second methods is shown at C and D.

The next stage is to cut a circular space and combine it with the cuts at D to form the patterns at E and F. The use of the veiner in conjunction with the first practised cuts



Wood Carving. Fig. 1. Selection of tools which are necessary to the wood carver
Courtesy of The Manual Training Tool Co. (Sheffield)

enables a variety of patterns to be formed, as indicated at G. This provides an effective method of wood decoration.

Another form of pattern is shown at H, and is more difficult, but with a perfectly sharp gouge the cuts can be made quite clean. It should be noted at this stage that a considerable amount of early carved decoration was effected by the above means, and numerous examples can be seen on old chests, settles, and other furniture. Most of the cuts illustrated at Fig. 2 are done in the direction of the grain, but practice in other directions of the grain must be acquired when some confidence has been gained in the use of the gouge.

The keen edge of the tool soon becomes dull, even when working with softwood, and unless the keenness is frequently renewed it will be impossible to obtain clean cuts.

Owing to the extra keenness required, a leather strip or two should be provided, so that the sharpened edge can be stropped. Leather belting is useful, one piece being thick, and the other thin enough to fold so that it can conform with the inner curve of the tool.

A Simple Panel. Having become proficient in making simple gouge cuts in all directions, a simple pattern, form as at Fig. 3, may be attempted, and for this purpose a parting tool and a flat gouge will be required. The shape of the centre diamond space with the triangular corners should be drawn out first, and the work can be screwed to a small block of wood so that it can be placed in the vice. Generally the height of the bench is too low for convenient carving, and it will be convenient to make a stand with 1 in. or 1½ in. wood.

The first stage in working out the pattern at Fig. 3 is to outline the inner parallel with a parting tool. The wood should be cut away to the centre boss with the flat gouge, and then the boss can be shaped with the latter tool. The last formation is indicated with the parting tool, and with the addition of the veneer the whole of the work can be effectively done.

It is a good plan to endeavor to do as much cutting as possible with the fewest number of tools, and if the pattern can be effectively done with the above mentioned tools much valuable practice will have been accomplished. A further example of simple carving is shown at Fig. 4. This is a spray of oak leaves with a few acorns.

The first stage after the drawing has been transferred to the wood is to cut out the back ground and leave the pattern standing out.

In the first place, the outline should be cut down with a vertical cut, and the waste removed with a flat gouge. It will be seen that

the stalk of the lower acorn is missing. This is the result of careless outlining. In approaching a thin stalk, the first cut should be at least ¼ in. away from the reputed line, and the ground should be removed before the wood is cut back to the correct line. If this is omitted, it is quite possible for the gouge to slip and entirely remove all across grain stalks, or, if it does not actually cut into them, the grain may be sufficiently raised to cause them to break off in the subsequent finishing.

The leaves should be finished with a veneer, and a slight amount of modelling effected with a flat gouge. A development of this form of work is shown at Fig. 5, which is an adaptation of a piece of early wood-carved ornament. The design is quite straightforward, but a gouge or two with quicker curves should be utilized. The ground is stamped with a punch to provide a suitable finish, but this should not be overdone, as it detracts from the general effect in some kinds of work.

Bold work with broader cuts should now be attempted, and a good example is shown at Fig. 6. The wood should be of even grain about 12 in. by 9 in. or 10 in. by 7 in., and 1½ in. thick at least. The pattern should be marked out and then cut down, leaving the pattern standing out. The first stage is to cut the inner portion down and then the top and bottom portions, leaving the two side leaves to be roughly shaped with suitable gouges and flat chisels. In work of this description each portion should be roughed out in turn, making no attempt to obtain any finish until the general shape of the curves has been worked. A certain amount of undercutting

at the top of the curves will be necessary, but the finishing of these portions should be left until the top rounded portions of the work are practically finished.

This exercise is to gain command over the tools, and not primarily to produce a piece of ornament. The left hand should be used just as much as the right, for the latter will hold the tool and give the necessary guidance to it, but the left hand is essential for purposes of resistance. Sweeping cuts with both gouge and chisel should be practised, and considerable skill will be required to enable the tool to be stopped before the cut becomes deep and perhaps begins to pull the grain apart. This must be avoided or infinite trouble may be caused. It is in the latter that the left hand will be most helpful, and it can be taken as a general rule that the tool should never be driven forward with one hand without applying the counter resistance of the other.

Another important point which experience will teach is not to put too much force on the tool when working in the direction of the grain, or near a delicate piece of cutting, the method being to remove the material by a series of small cuts. Another use of the exercise is in enabling the carver to give texture to the surface.

The finishing cuts on the rounds should conform to the main direction. This is not so evident in the photograph at Fig. 6, except in the sweep of the hollows, but the main idea of the finishing marks should be to convey to the eye the main form of the shape.

Preliminary practice in the formation of curved surfaces can hardly be carried to excess. It is the best means of obtaining a command over the tools and gaining an intimate knowledge of the material. The shaping of leaves, as shown at Fig. 7, indicates a line of work which provides invaluable experience. The general method of tackling the outlining is the same as in the previous example, but the great variety of curves running in all directions of the grain, should provide opportunities for the use of all the tools in the suggested outfit.

In dealing with the carving of natural forms, much depends on the position of the finished work, and as the carver is limited by the grain of the wood in exactly imitating many forms, it becomes necessary to utilize the effect of light and shade. It is impossible to represent exactly any natural form in wood by means of carving tools. Some slight alteration here or there must be made to conform with

the limitations of the material and with the effect of light and shade, so that the representation must be conventional. The beginner, modelling leaf and flower shapes, need not conventionalize to any extent until the difficulties of technique have been overcome. The laurel leaf, shown in Fig. 7, is capable of providing unlimited surface modelling.

In working out the shape, the first stage consists in forming the main shape and cutting away to form the back ground. The main direction of the curves should be roughed out with suitable gouges, and the final shaping effected with suitable flat gouges and chisels. The lightest possible touch should be used, and the tool held in complete restraint as

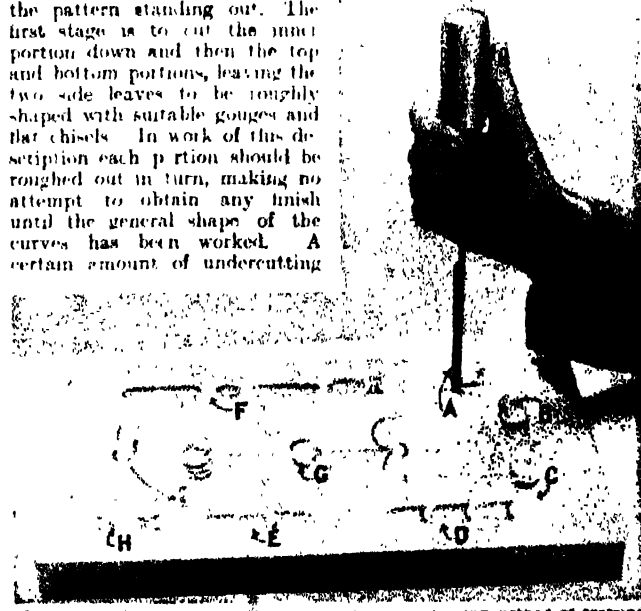
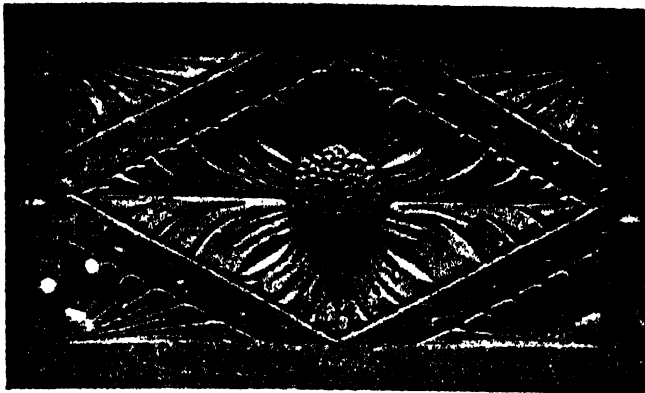


Fig. 2. Preliminary cut with gouge and veneer, showing method of forming a simple pattern. Explanations of the lettering will be found in the text



Wood Carving. Fig. 3. Simple panel which will give the amateur practice in the use of a flat gouge and paring too.

shown. This is particularly required when approaching the edges of the leaves, and as far as possible the shape should be completed on the top surface before the undercutting is attempted. The exact position of the tool cannot be stated as it should be changed cut by cut to conform with the direction of the grain, but in the main the fibres of the wood should be sliced.

All cuts should be made entirely with the hands directing the tool, the mallet being reserved for such work as outlining and cutting out large outer surfaces. Some very hard woods may require such pressure that is beyond hand power to perform; but, generally, if the tool is kept perfectly sharp, and small, thin cuts are made, there will be no need for mallet work.

Where necessary the left hand should hold the chisel and continually restrain it, while the mallet is used to give a number of light taps. Nothing in the way of heavy blows should be allowed, even with the hardest woods. It is far better to attend carefully to the keenness of the cutting edges of the carving tools. The conventionalized treatment of leaf forms is shown at Fig. 8, and work of this sort makes an excellent exercise for the beginner. It will be seen that the main line of the con-



Fig. 8. Simple design for bold work.

manner so often seen in medieval work. In this example the curvature of the leaves renders the carving much more difficult, and incidentally provides excellent practice in the control of the tools in finishing the surface.

The best method of dealing with the panel is to form the main curves without attempting to do any of the actual shaping, either on the surface or on the edges. As much of the ground as possible should be removed, keeping it flat, and in this connection it is an advantage to use a strip of thin wood to rest across the panel from side to side and to drive a wire nail through it, to project when filed off flat, to the required depth. This rough depth gauge can be used in all positions and will help in obtaining an even surface. The curves leading to the tips of the serrations of the leaves should be made as flowing as possible, and although a distinct depth is necessary, it should not be overdone. The raised portions of the edges should be slightly undercut, in order to emphasize them, but generally the amount should not exceed $\frac{1}{4}$ in.

It should not be necessary in continuing the exercises in carving to use a plaster model, and, with a view of training originality of treatment, the better plan is to work from a drawing shaded with charcoal or crayon. Assistance can be given by studying carvings in museums, and by making pencil sketches of details.

The shield at Fig. 10 is an example of finished surface modelling, and the craftsmanship involved forms a valuable training. The leaf border should be done first and carried to not more than $\frac{1}{8}$ in. deep, as the whole effect is one of low relief. The border is well filled without an excess of

a veiner, and then to work each side to the approximate depth. The beginner, unless thoroughly conversant with the formation of the leaf, should work from an actual cast, or at least a photograph of a finished piece of work. Finishing this a pencil drawing can be used if the effect of light and shade is shown.

An elaborated form of the same kind of leaf is shown at Fig. 9; it introduces animal forms treated in the more or less grotesque manner often seen in medieval work. In this example the curvature of the leaves renders the carving much more difficult, and incidentally provides excellent practice in the control of the tools in finishing the surface.

Decoration of Furniture. The application of carving to furniture will be the main object of the home craftsman in learning the craft, and some appreciation of the particular form required is necessary. The florid decoration of the so-called dark oak antique furniture should be avoided. Many examples of excessive carving can often be seen, and in these cases the furniture in question has been made with the idea of providing as much carving surface as possible.

The piece of furniture on which it is desired to execute carved ornamentation should be designed primarily for its correct purpose, and the carved decoration should be secondary and not prominent. Small carved panels in a framed door may be made entirely decorative and yet, on the other hand, by the use of unsuitable designs, the eye will not be able to take in the proportions and lines of the framing, but is attracted by the weight of the

decoration. It is difficult to say exactly what proportion of the space should be decorated in any article of furniture; this is a matter of training in the laws of design and the appreciation of good form, but the first essential is restraint, the second being proportion.

Many beautiful examples of wood-carving can be seen in old oak chests where the stiles and rails only are carved with a simple pattern in gouge cuts; in other chests the panels only are carved, the rails and stiles giving an idea of solidity and strength. The classic style of

ornament is valued by many woodcarvers as providing a subdued form of decoration, and the example of acanthus-leaf ornamentation at Fig. 11 is a type of what can be done.

Animal and figure forms in the round should not be attempted by the amateur craftsman without some considerable preliminary work in modelling. A sculptor finds it necessary to use clay to enable him to appreciate form, and, apart from the technique of dealing with the materials, there is very little difference between the stone and wood sculptor. The stonecarver works on similar lines to the woodcarver, and generally would be unable to tackle the figure, although a head, particularly a grotesque head, may be attempted.

Many woods are suitable for carving, but they should be of even and uniform grain, free from knots and shakes, and have been thoroughly seasoned. The grain should be as close as possible and free from strong markings. Of the softer woods more suitable to the beginner, but still useful for many forms of carving, are yellow pine, American whitewood, basswood, lime, and Kauri pine, and of these yellow pine will be found the best for

timous curve on which the ornament is based is retained as a fine edge, and the test of good craftsmanship lies in the ability of retaining the edge throughout. The first stage in carving the ornament is to cut out the outline and the straight sides with



Fig. 4. Outline cut ground to leave pattern. Fig. 5. Carved panel with punched background.



Wood Carving. Fig. 7. Method of using a flat gouge in shaping natural forms, such as a leaf.

preliminary work. Of slightly harder woods there are sycamore, satin walnut, beech, and holly, and of hardwoods, oak, walnut and sometimes mahogany can be used.

It is generally easier to obtain suitably seasoned yellow pine, and if used in at least 1 in. thickness no trouble should be experienced in working it, but it is not suitable for high relief. American white wood and basswood are good for preliminary practice, but tools require more sharpening than is necessary with yellow pine. Lime is not so easily procurable, but if it is properly sawn and thoroughly seasoned it forms an ideal material for the beginner, especially when working out such examples as shown at Fig. 3. The intermediate woods can be used for the examples given in Figs. 4 and 5.

The kind of walnut known as Italian is more suitable than the home-grown variety. Much of the walnut supplied by timber merchants is sawn so as to show the figured grain, and this is especially evident in the English wood. The grain should be as close and as straight as possible, and wood for carving must be cut from the heartwood, sapwood being distinguished by light streaks or markings. The wood is more suited to low-relief carving, but with selected specimens it is possible to obtain effective high relief.

As a rule carving should not be polished, the only treatment allowable is that of oiling or

place of a skewer. The pinions should always be cut off at the first joint, and the feet crossed after the legs have been secured in place. The bird is cooked undrawn and must never be overdone.

Roasting is the usual method of cooking woodcock. After trussing brush the bird all over with oiled butter, then tie over the breast a slice of bacon, and roast from 10 to 15 min., basting frequently. Woodcocks should hang when roasting with the feet downwards, and a piece of toasted bread should be placed underneath for the purpose of catching the trails. If hanging the birds to roast is not possible let them rest on bars in a baking-tin, and in the bottom of the tin underneath the bars lay toast. The birds are served on this toast with a good brown gravy and a garnish of hot seasoned watercress and cut lemon. To carve, split the bird right in half through the centre, cutting from neck to tail and with each portion give a piece of the toast. See Game.

WOODLOUSE. Because of its slaty colour the woodlouse is often called a slater. Nocturnal in habit, it feeds upon plants and seedlings and may do considerable damage. When its presence is suspected all rubbish and crevices of dry wood should be searched in the neighbourhood of the plants affected, and if necessary treated with boiling water. Traps may be prepared with hay filled flower pots, the sides being smeared with treacle. Borax or beetle poison may be used, and there are also proprietary preparations.

WOODRUFF. This is a pretty low growing plant which spreads very thickly and is suitable for planting in odd corners, whether shady or sunny. It becomes smothered in small white flowers in spring, and if planted with long time notes provide a charming display. It should not be set among choice plants owing to the rapidity with which it spreads. Any little rooted piece pulled off and replanted will grow. Its botanical name is *Asperula odorata*, the leaves have a bay-like scent when dry. The blue woodruff (*Asperula azurea*) is a hardy annual 9 in. high with pale blue flowers in summer, seeds are sown out of doors in spring. *Asperula*

suberosa with greyish leaves and pink flowers, is a charming little spring flowering plant, excellent for the rock garden, where it should be set in very gritty soil.

WOODSIA. The hardy kinds of this fern require a leafy or peaty soil, and a position in shady borders or banks. Greenhouse species are best grown in pots of peat, loam and silver sand. The plants should be placed in a shaded position, and watered freely from March till October. The maximum height of the plants is about 12 in. The hardy sorts are all suitable for greenhouse cultivation. Propagation is by division. See Fern.

WOOD SORREL. This is a pretty, low growing plant suitable for the rock garden and for sunny corners. One of them (*Oxalis acetosella*), which grows wild in woods in Britain, bears white flowers in spring and is



Woodruff. Fragrant clumps of the pink *Asperula suberosa*, a favourite spring flowering rockery plant.

suitable for planting in the rock garden. It is, however, less attractive than two kinds from the Falkland Islands, *adenophylla* and *oneophylla*, which have grey leaves, and pink and blue-coloured blooms respectively, and thrive in a compost of sandy loam and leaf-mould among the rocks. A popular wood sorrel which is often seen in cottage gardens is that known as *Corniculata rubra*. It is a low growing spreading plant with copper coloured leaves and yellow flowers. The wood sorrel is propagated by division during the spring.

waxing, and these are used to protect the surface and not for polishing.

WOODCOCK.

The season for woodcock extends from August to March. In choosing a bird press the breast and pinions, the feet also, will be supple if the bird is fresh and in good condition, the head and throat clean and the flesh firm. The bird does not usually weigh more than 1 lb. It is prepared and trussed like the snipe, with the head left on and the long back thrust through the legs and body in



Figs. 8 and 9. Methods of treating conventional forms. Fig. 10. Banded with low relief border carried out in a conventional design. Fig. 11. Showing the method of treating the classic form of the acanthus leaf in wood.

WOOD TURNING FOR THE BEGINNER

The Use of the Tools and the Results Produced

The important operation of Turning is described in this work under two main headings, each corresponding to one of its branches. Thus the manipulation of metal is dealt with in the article Metal Turning. See also Lathe, Mandrel, and the many articles that describe items of furniture etc., the component members of which are turned, e.g. Candles, etc., Chair, Table.

Wood turning consists chiefly in fashioning wood to circular shapes by revolving it in a lathe and applying cutting tools to the surface. It has many and varied applications in the home, being the only practical method of producing chair and table legs, little columns with turned bases, candlesticks and a host of other articles which are circular in section.

The amateur should commence by practicing on such material as boxwood or beech

tool is V pointed and ground and sharpened on the outside of the V.

Using the Gouge. The method of holding the gouge is illustrated in Fig. 1, the blade being grasped in the left hand near to the cutting end of the tool. The outer part of the first finger of the left hand is pressed against the back of the T rest, while the fingers of the left hand hold the gouge firmly to the top of the rest. The right hand grasps and manipulates the handle. To use the gouge, the piece of work is first fixed and the lathe started.

It is necessary to remember that as the wood revolves it appears to the eye to be solid and circular, but as a matter of fact it will be

half-twist is given to the blade directly it commences its cut, and the tool is traversed bodily towards the headstock, taking care to maintain full control over its movements.

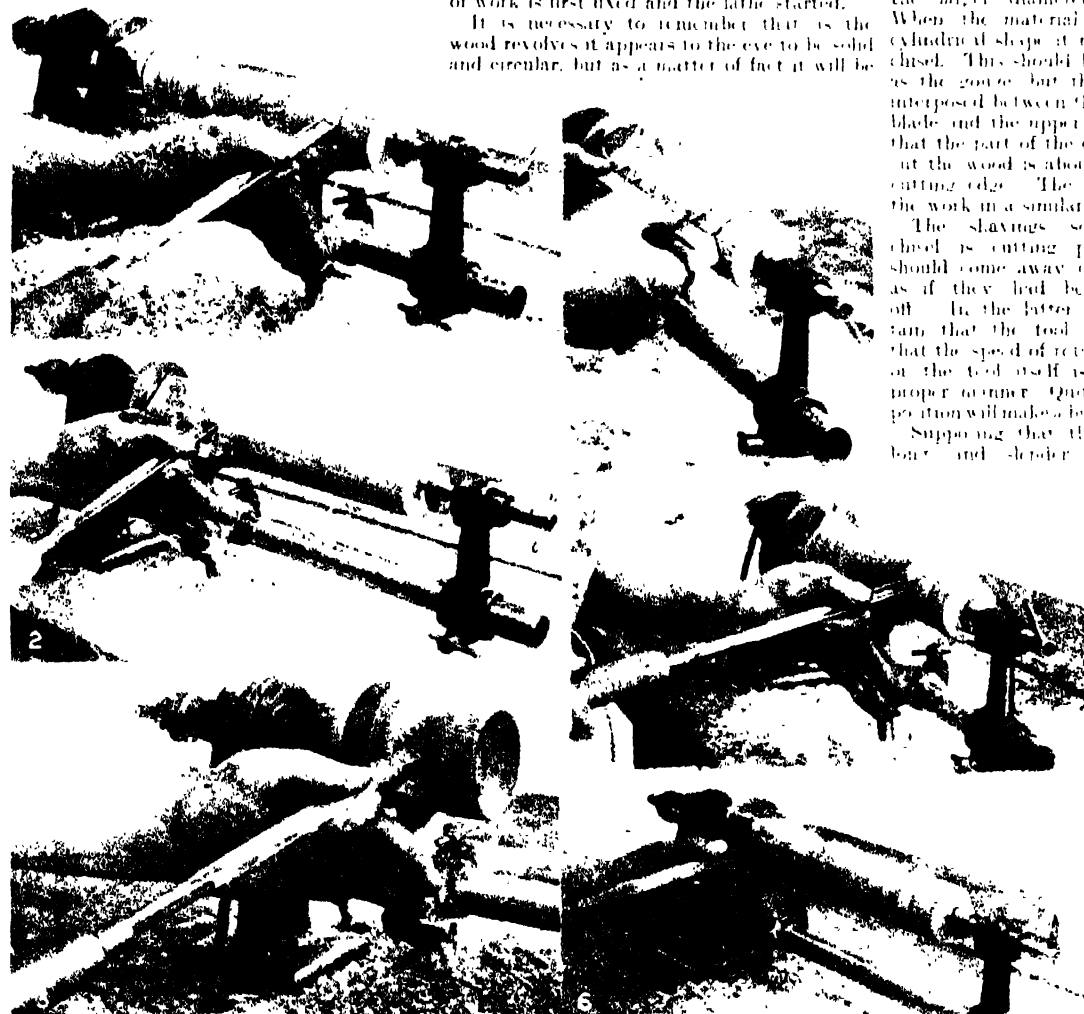
It is usual to terminate the cut at some distance from the chuck or face plate, except in those cases where the end of the wood is overhanging and there will be no risk of the tool catching up on the chuck. The same operation is repeated with the same caution until the general diameter of the material has been reduced to its proper size, when it will be circular in section and more or less cylindrical in shape from end to end. From this stage the pattern of the object can be turned.

Turning with the Grain. To ensure turning with the grain of the wood always work downwards, as in Fig. 3, traversing the tool from the larger diameter towards the smaller. When the material has been reduced to a cylindrical shape it may be smoothed with a chisel. This should be held in the same way as the gouge, but the left thumb should be interposed between the under-side of the chisel blade and the upper surface of the T rest, so that the part of the chisel which will actually cut the wood is about the middle part of the cutting edge. The chisel is traversed along the work in a similar manner to the gouge.

The shavings soon tell whether the chisel is cutting properly or not. They should come away clean cut, and not look as if they had been scraped or rubbed off. In the latter event, it is almost certain that the tool is not sufficiently sharp, that the speed of rotation is not high enough, or the tool itself is not being held in the proper manner. Quite light variations in the position will make a big difference in the finish.

Supposing that the work is comparatively long and slender, for example, a small leg for a stool, a

good plan is to prepare a full size drawing of the desired shape. Then take a bit of wood and drive sharp-pointed nails through it at those places where the shape of the object changes. When this is applied to the revolving cylinder the points of the nails scratch a series of lines, as in Fig. 4, which indicate the points where hollows or curves are to be turned. In order to turn a hollow, as in Fig. 5, the gouge is used first from one side towards the valley, and then from the other side, working downward, and consulting the cutting edge of the



To avoid accidents, he must always see that the material is properly fixed in the lathe, so that there is no risk of its flying out. He should hold the tool firmly, and bring it near the revolving wood with caution. The turning tools are provided with a long handle very securely attached to the shank. They must be kept absolutely keen and sharp. A blunt tool is a danger.

A gouge, chisel, and V-point or veiner are the principal tools required. A gouge about $\frac{3}{4}$ in. wide is suitable, although it is an advantage to have one rather smaller, and also a thicker one. The gouges are ground on the outside of the curved part. The cutting end of the chisel is inclined and the edge comes in the middle of the thickness of the blade, both sides being ground off to a taper and sharp

ened on an oilstone. The veiner or parting off tool is V pointed and ground and sharpened on the outside of the V. Consequently, by approaching the gouge to the imaginary face of the material, it will, in fact, only cut off the high spots or corners, as in Fig. 2, and it is at this stage that the utmost care must be exercised. The tool should be pointed towards the work and held with the blade pointing at a small angle towards the headstock. A peculiar

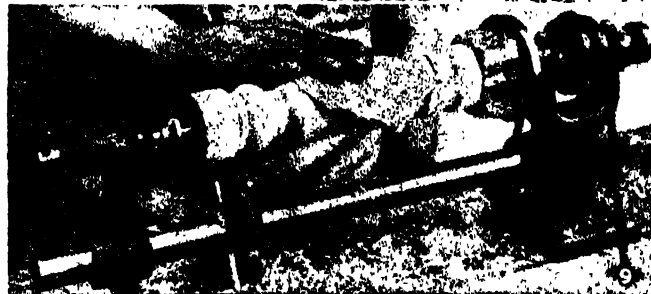
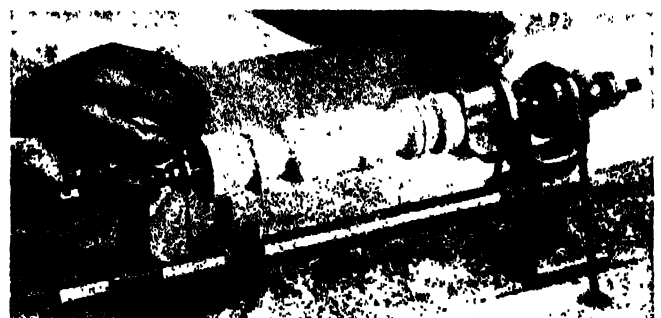


Wood Turning. Fig. 1. Correct way to hold the gouge. Fig. 2. Gouge shown cutting off high spots or corners of the rough material. Fig. 3. Working downward in order to avoid splitting the grain. Fig. 4. Applying scratch gauge to show points where hollows or curves are to be turned. Fig. 5. Turning a concave surface. Fig. 6. Parting off with chisel held vertically. Fig. 7. Hollowing a bowl.

gauge to describe an arc of the circle or follow a curved part by moving the handle of the tool sideways while resting the major portion of the weight on the hand rest. Flats are usually shaped with a chisel, and parts at right angles to the axis of rotation by holding the chisel with its narrow edge resting on the hand rest, as in Fig. 6. The breadth of the blade is vertical, the cutting edge thus inclining backward. It has to be worked very carefully, and a little cut made on each side of the valley so that the tool will not jam in the grooves. Fine lines and beadings are often turned with the point of the chisel.

If it is desired to turn to dimensions, calipers should be used in the ordinary way. It is assumed that the work is mounted between centres on the usual prong or fork centre or on a small face plate with a taper screw centre, screwing it to the latter or driving it on to the prong chuck with a few strokes of a mallet. The opposite end is then supported with the point centre of the tail-stock, the latter being forced into the end grain of the wood and locked firmly in that position. When a piece of flat material is to be turned into a disk to form a base or support, the best method is to secure it by screws to a suitable metal face plate, which screws on to the mandrel nose. A similar mode of chucking can be used for various sorts of bowls and similar work.

and bolted to two massive supports. On the left is the head-stock, which is bolted to the bed by plates passing underneath. The spindle is fitted with a four speed cone pulley for flat belt drive. Bearings of heavy phosphor bronze are used, adjustable for wear, while lubricators are attached. The hand



Wood Turning. Fig. 8. Use of template consisting of a piece of card or zinc cut to the correct profile. Fig. 9. Smoothing the work with glass paper before the final operation of polishing.

WOOL. There are numerous grades of wool, but, generally speaking, it comes under two great divisions, merino and cross-bred. The merino sheep is bred in Australia chiefly for its wool, while the cross-bred sheep is largely bred in New Zealand, partly for its fleeces and partly for its carcasses.

The two different kinds of yarn produced from wool are known as woollen and worsted, and, generally speaking, all woven goods made from wool come under one of these two classes. For woollen cloths the yarn is not so fine, strong or elastic as for worsteds, which require the longest fibres of wool spun into smooth yarn. Merton and pilot cloths, saxones, tweeds, chevots and blankets are examples of woollen piece goods, while worsteds include Botany serges, suitings, gabardines, Bedford coats and hopsacks.

For some yarns hair is used in combination with worsteds, as, for instance, camel's hair, goat's hair and alpaca. Owing to the greater length of fibre in the formation of worsted yarns, worsted fabrics wash better than woollens. The latter have a tendency to felt, and bleaching powders should not be used, as they eventually dissolve the yarn.

Knitting wool bought in skeins is best left in that form until wanted. When winding it into balls the thread should not be wound too tight. The softer kinds of wool are warmest in wear, but the harder sorts of worsted yarns last longer and shrink less. Three-ply and four-ply wools are bulkier than two-ply.

Mending wools may be bought by the skein or on cards. Special wools are sold for tapestry needlework. Berlin wools are a softer, coarser kind. Very durable and heavy wools are manufactured for rug-making. See Crochet; Knitting; Rug; Shawl; Stocking, etc.

Woolly Aphis. See American Blight.

WOOLWORK AND WOOL EMBROIDERY

Quick and Effective Methods in Ornamental Needlecraft

This article deals chiefly with pictorial and conventional designs worked in wools on linen fabrics. Solid embroidery on canvas is dealt with in the contribution on Tapestry Needlework, and other special forms of woolwork are described under the headings Crochet; Knitting; Rug. See also Appliqué Work; Embroidery; Laid Work; Needlework Picture.

Used in its broader sense, the term woolwork includes all work done with wool yarn and needles, or special hooks, from darning and knitting to crochet and knotted rug-making. In particular it is applied to pictorial designs and needlework pictures carried out partly or wholly in coloured wools.

The term wool embroidery is also a broad one, covering any decorative stitchery in wools, but in particular the term is employed for fancy work in which naturalistic or conventional designs are partially embroidered in wools leaving portions of the background fabric exposed.

Woolwork pictures as carried out in the 17th and 18th centuries would be too tedious for most needleworkers of to-day, although smaller pictorial designs are still exquisitely worked in petit point or bags.

Materials and Designs. Very effective woolwork or embroidery can, however, be quickly achieved on rather coarse linen, coloured or of an unbleached shade, using skeins of tapestry wools, or penny balls of embroidery wools with crewel needles.

An embroidery frame will be needed by most workers for a solid pictorial design.

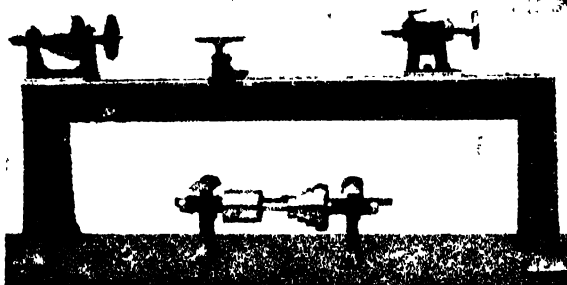


Fig. 10. Example of a simple lathe, suitable for the amateur woodworker.

Courtesy of J. Sagar & Co., Ltd.

Internal work is carried out in much the same manner as external wood turning. With a small bowl, for example, such as that illustrated in Fig. 7, the best plan is to turn up the centre first and work outward. The testing of the size of the work is accomplished by the use of inside calipers, but with intricate or important shapes a simple template may be used and applied to the work from time to time (Fig. 8), as a check to the eye. The work should be finished with glass paper, a small piece being grasped between the finger and thumb and worked over the curved surfaces, as in Fig. 9. In the case of flat work the paper should be wrapped around a flat wooden block or rubber and used with a slight forward and backward motion while the work is being rotated at the highest possible speed. When designing parts to be turned, and it is necessary to join two or more pieces together, the best plan to ensure keeping them all in line is to turn a small projecting peg on the end of one part, and to bore a similar-sized hole centrally in the other part. This will serve to centre both parts and keep them in their proper relative axial line.

Choice of Lathe. The article on Lathe discusses the principles governing the design and construction of this appliance, as modified by the specific purpose for which it is intended.

The main considerations in a lathe for wood turning are a good headstock with bearings suitable for prolonged working at high speeds, an adjustable tailstock, and a suitable rest for the turning tools.

An example is given in Fig. 10. The bed, which is flat topped, is accurately machined

such as that illustrated in Fig. 1 which could be charmingly adapted and worked in natural colours on linen for a cushion screen or blotter panel, or framed and glazed for wall-decoration. An embroidery frame consisting of two wooden hoops would be a suitable one on which to work a panel of small size, but if the panel is a large one the regulation embroidery frame with rollers, on which the work can be evenly stretched, will be needed. For work of less solid design a frame is not necessary, but to prevent puckering a good method is to pass the needle up and down through the embroidery as if on a frame.

A great variety of transfer designs can be bought either for flowers, figure or geometrical embroidery, or many different



a cushion, bedspread or duveteuse set, they may be enclosed in a circle made by drawing round a plate of the size required and outlining the edge of the circle with chain stitch in black wool bordered with back stitch. The rest of the work can be speedily carried out in Berlin wools in Victorian shades of bright blue, grass green, magenta and foxglove pink, and can be done on felt or hessian, crash, rattine or linen.

Most of the stitches used for woolwork are given in the page of stitches illustrated in the article on Embroidery. When starting a piece of work it is a good plan to select the stitches which will be most useful for the various portions of the design. Fig. 2 shows the stitches which may be used for the polyanthus flowers and leaves in Fig. 1. The flower on the right can be worked in satin stitch as shown and then outlined in back stitch, that on the left in long and short stitch on the outer portion of the petals and with satin stitch in different shades for the inner portion and centre. The leaves can also be worked in satin stitch with the veins in stem stitch, back stitch or crewel stitch in a darker shade of green. The bowl may be outlined in crewel stitch with one or two lines of shading. Each group of flowers is worked

in one of two ways, a glance at Fig. 1 will show which method is applied to each.

Jacobean Designs. A big selection of effective designs are obtainable in which conventional flower, leaf and fruit forms are partially worked with tapestry wools in solid embroidery, and partially with outlining and light filling stitches. These designs are copied and adapted from old Jacobean needlework. Fig. 3 shows a typical corner piece of such conventional form for a cushion or runner, while Fig. 4 gives the outlines to be transferred, filling stitches being left to the taste of the worker. Suitable transfers are obtainable for cases and other accessories in this style of embroidery.

Jacobean designs are worked in strong colours, but not too brilliant in tone, as they should look mellowed by age. The large leaf at lower corner of design is first worked in green chain stitch and a greenish-blue outline stitch just outside the chain stitch. The veining and stem of leaf, fruit, and flower are all worked in old gold and brown stem stitch. The small leaf to the right is filled in with two rows of green berringsbone stitch, the stitches lengthening towards the centre of leaf and tapering at point. The sprays of grass at each side of the design are represented by fish-bone stitch and the round dots are covered with satin stitch, with an outline of black back stitches. The large centre blossom has the four-pointed petals worked in long and short stitch in deep crimson round the tip and a rose-red below.

The other four petals are worked in two shades of greenish-blue sloping satin stitch, dark blue at the centre of each leaf and medium blue buttonhole stitch all round with the

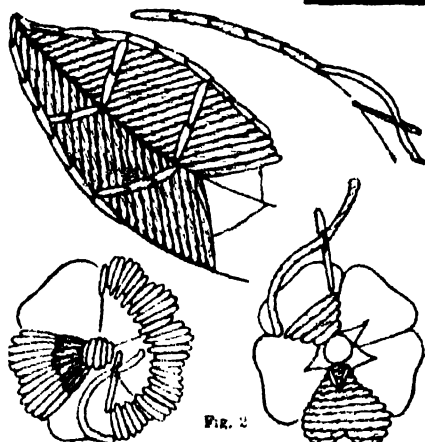


Fig. 2

Woolwork. Fig. 1. Pictorial design of polyanthus grouped in a bowl worked in natural colours on grey linen. Fig. 2. Details for working flowers and leaves. The flower on the right is embroidered in satin stitch, that on the left partly in long and short stitch and partly in satin stitch.

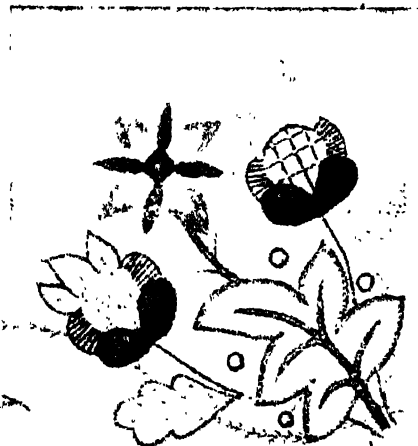
ideas can be utilized. Flower, bird, animal or Japanese prints can be traced and transferred by means of carbon paper to the material to be embroidered. Directions for transferring designs are given in the article Embroidery.

Interesting conventional designs can be worked out by pencilling the outlines of coins to mark rounds for flowers, and evenly spacing a number of these on a piece of paper the size of the work, then transferring the drawing to the material. Larger flowers can be worked in buttonhole stitch with an inner ring of chain stitch and centre of French knots, smaller ones in lazy-daisy stitch and rose stitch. The intervening spaces can be filled in with trellis (q.v.) stitch, or with diamond or diaper stitch (see page 974). Instead of working these designs all over



Fig. 4

Fig. 3. Corner design in Jacobean style suitable for cushion, bedspread, or other square piece of house-linen. Fig. 4. Design enlarged. By omitting the left-hand spray an effective modification is obtained.



stitches about one-eighth of an inch apart. The centre has a cluster of dark-red French knots surrounded with two rows of black chain-stitch set square. The solid work at the base of the fruit is carried out in two medium shades of red long and short stitch, while the sides are buttonholed and the centre filled in with a couched pattern, such as diamond couching or clasper couching (see page 674), and in each little division is a French knot. The shades of red used should be intermediate between the crimson and rose-red of the flower petals. The three leaves at top of left-hand fruit are worked in outline stitch, while the right-hand one has the leaves in chain stitch, with fish-bone to the centre veining.

Wool embroidery may be used to ornament woven raffia table mats or on raffia cloth. Small electric light shades or shucks made of linen stretched on wire frames suitable for wall brackets can also be decorated in wool. Care should be taken that the stitchery is neat on the reverse side. Directions for making-up are given (p. 680) under Lampshade.

WORCESTER CHINA. Both useful and decorative porcelain has been produced at Worcester continuously since the middle of

type of work box which is useful in a sitting-room is the fitted box pouffe with a strip for holding scissors, etc., and a pincushion attached to the lining of the lid and pockets for reels, skeins of silk and other accessories in the lower part.

In the 18th century a great deal of care and time was spent in producing beautiful work-boxes, and some examples of that period are very fine pieces of craftsmanship. Their beauty was enhanced by the costly woods used for them. Work tables were also made with a receptacle in the shape of a bag under them for holding materials. Such tables were designed by Sheraton and others, and were known as pouch tables.

Our illustration shows a work box made in the early part of the 19th century. It is of

wood covered with red morocco and fitted with brass mounts and feet. Some of these antique work boxes are of wood with glass tops surmounted by metal mounts and lined with quilted satin.

A Woven Work Basket. A circular basket can be made with round cane and raffia, after the manner of Indian basketry, by forming a circular mat, building up the sides and attaching a cover similarly made to the bottom. The method is illustrated in Fig. 1, the materials used being ordinary round cane, plain or coloured raffia, and a needle having a long eye to take the raffia. The bottom is commenced by forming a small spiral with the tapered end of a length of cane, tying the cane together as the sides join. Two complete rounds are formed, and then the work is continued, as in Fig. 2, by threading the raffia first round the cane and then carrying it across the cane adjoining, and between it and the one beyond it nearer the centre.

Fig. 3 shows the third round completed, and the commencement of the fourth round. As the work progresses it is necessary to bind the

raffia twice round the cane in order to cover it in the spaces between the connecting stitches, which should not be too far apart. Having completed a flat circular mat of the desired size, say 8 in. to 10 in., for the bottom of the work basket, the cane is continued, but it is placed on the top of the outside ring instead of on the sides, and continued in the same way, each round being placed on the top of the one below to form the sides of the basket, as in Fig. 4.

Having reached the required height, from 4 in. to 6 in., the cane should be sliced to a long taper and gradually worked out so that the top of the sides is flat. A lid is made in the same way as the bottom, and, when the diameter is sufficiently large to fit on top of the sides and slightly overlap them, the end of the cane is tapered and finished off, the raffia being continued for a complete round to give a neat and strong edge. A raffia covered ring or bunch of raffia flowers for a handle, or one after the style illustrated on the raffia cosy on page 1025, is secured to the top of the lid, which can be hinged with raffia to the side. The inside of the basket should be lined and padded; if the exterior is to be varnished this should be done before the interior is fitted. The lining may be of silk or a good printed cotton over a layer of wadding. Separate pockets may be added for reels, tapes, needles and buttons.

Wool embroidery can be effectively used to ornament the cheap rush baskets sold for shopping bags. The handle is removed and the basket, when embroidered, is lined with satin, allowing sufficient depth of material to draw up into bag shape at the top after a slot has been made in the satin to take a ribbon or cord. Buttonhole the lining to the top of the rush basket to keep both together neatly. Any bold flower design may be worked effectively in bright, rather coarse wools.

A rush or cane wicker paper basket makes an excellent mending basket, lined in the same way with a big top and trimmed with raffia flowers, wool embroidery or appliqué of linen, felt or cretonne flowers in the manner indicated in page 28. See Mending; Needlework; Osier; Raffia Work; Rush Work; Scissors; Woolwork.

WORKMEN'S COMPENSATION. The liability of an employer to pay Workmen's Compensation to any employee injured by an accident arising out of and in the course of his employment, or to the dependants of such an employee has been replaced by a state scheme under the National Insurance (Industrial



Worcester China. Coffee cup and saucer painted with Watteau figure-subjects, exotic birds, and insects in colours in shaped panels.
Courtesy of Mrs. Foxham & Co., Ltd.

the 18th century. Although china figures are virtually absent from the range of early Worcester, the number of the patterns of tea and coffee services and other useful pieces far exceeded that of any contemporary factory in England. In recent years figures and vases have predominated.

The dominant mark until 1793 was the crescent, although down to 1783 many pieces bore a cursive W, and others a square mark, some pseudo-Chinese devices, and even the Dresden cross of words. The square mark frequently appears on numerous blue-scale Worcester. The second period is mostly recognizable by the initials or names of the Flights and Barrs, with a crown after 1788. The words Chamberlain's Worcester, with various devices, serve to identify that factory's output. Grainger used G & Co in a shield, with Royal China Works, Worcester. The company mark is a crowned crest enclosing a central crescent or C surrounded by four W's.

Wall's copies of Chinese blue-and-white, as well as his egg shell, were supreme. The mugs had vertical sides, and the early cups usually no handles. Coughley mugs in imitation of Worcester, with a C simulating the crescent mark, are recognizable by having splayed instead of straight bases. Vase and jugs with scroll-like grooves have been prized at all times. Hancock's blue-enamelled prints, which reached their highest level when done on Worcester bodies, were often signed by him, but have no factory mark.

The latter part of the first period coincided with the arrival of artists from Chelsea, and the adoption of maroon, emerald, apple green and other grounds, with panels of exotic flowers and birds, or Watteau scenes. There were also wild roses in relief on white, and open work borders. This early ware usually contained stoneware in the body, and appears greenish when held to the light. The standard English bone porcelain was not established at Worcester until after the year 1810. See China; and Colour Plate facing p. 1357.

Worcester Sauce. See Sauce.

WORK BASKET AND BOX. Obtainable in a variety of shapes and prices, work baskets are made in osier, cane, plaited rush, and raffia. Generally they are fitted with the necessary articles used for plain needlework; these are attached directly to the lining, which is provided with pockets.

The large wooden work box fitted with trays and compartments is less in use to-day than some form of work basket or a work table, which is really a work box on legs. Another



Work Box in wood, covered with red morocco, with gilt brass mounts. Early 19th century.
By permission of the Director, Victoria & Albert Museum, S. Kensington.

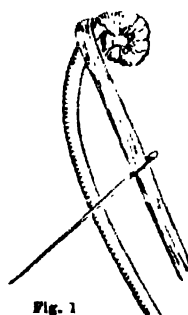


Fig. 1

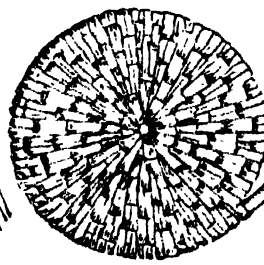


Fig. 2

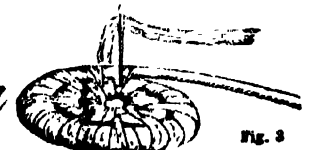


Fig. 3

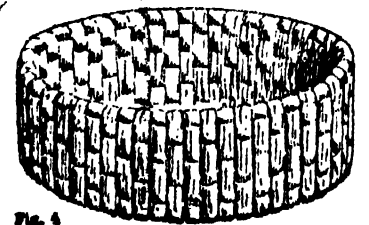


Fig. 4

Work Basket. Fig. 1. First step in making a round basket. Fig. 2. Bottom of basket formed by threading raffia round the cane. Fig. 3. Work in progress at beginning of fourth round. Fig. 4. Sides made by placing cane rings one above the other.

Injury Act. All persons must be insured under the scheme. The contributions are paid partly by the employee and partly by the employer, the employee's share being deducted from his or her wages. See Insurance: The National Health Scheme.

WORKSHOP. The home worker may be confronted with the problem of finding a place where he can do his work with some measure of convenience. He will need a shed or room where he can work at odd moments and, more important still, where his partly completed job can be left in safety. A bench is a necessity, and unless one of the collapsible structures is used, this demands a room or building set aside for its accommodation. Work which has been glued up must be left to set and harden in a place where it will not be interfered with, or be subject to chance knocks. Tools must be housed out of the way of children.

Of course, a sectional building of some sort, as illustrated under the heading Shed, can be purchased, but the home worker will derive pleasure, experience, and profit from making his own workshop. Those who decide to follow this latter course could well use a lean-to construction, built into the corner of two walls, illustrated and described on page 131.

Much helpful information about the framing, joints, etc., will be found in such other articles of our Encyclopedia as Garage; Roof, etc., and, of course, the appropriate wood-working contributions can be referred to.

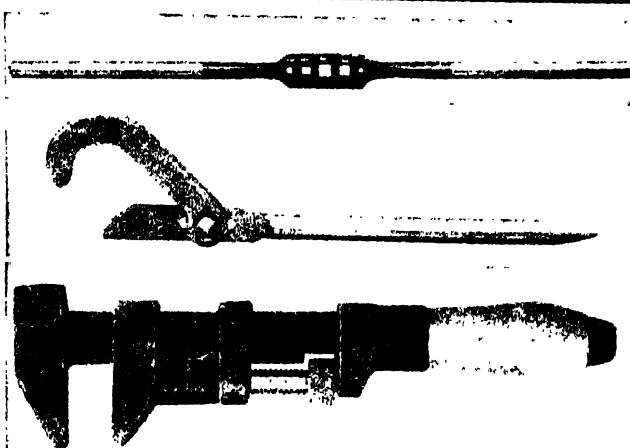
WORM In Furniture. Old furniture is very liable to attack by the woodworm, a tiny insect that burrows into the material. Beech, larch, and walnut are perhaps the most liable to attack, but it is also found in mahogany and other hardwoods.

The insect generally obtains entrance to a piece of furniture through an unpolished surface. Chairs are often attacked at the feet, the first hole being made on the surface that has not been treated with polish of any kind. Tables, the tops and legs of which are treated with beeswax or turpentine, are probably attacked from the under surfaces which are unpolished. This is said to be due to the fact that the insect, unable to get any life in a polished surface, requires a tiny crack on which to begin operations. The fact that worm holes frequently appear first of all on the back of a piece of furniture that has for years been close up to a wall, or on the unpolished rebato receiving a chair seat, points to this.

A good remedy for the worm is a 40 per cent solution of formalin up-cast into the holes with a small glass syringe. Paraffin is also used and there are a number of patent preparations. Another remedy is to swab the worm-eaten wood with perchloride of mercury or corrosive sublimate. This deadly poison must not be allowed to come into contact with the skin. Other remedies include alternative applications of carbolic acid and paraffin applied to the backs of wardrobes, the insides of chests of drawers, and other places where any ill effects from the acid will not be noticed. Another recommended remedy is paraffin and thymol.

Fumigation is another preventive method. Carbon bisulphide is a good fumigant. One way of using this, only suitable, however, for small pieces, is to make an airtight box, to put the article inside this, and to leave it exposed to the fumes for two or three days. The whole surface of the piece is then painted over with a solution of sodium arsenate, a poison which prevents the insects from entering again.

Large pieces of furniture, such as sideboards and wardrobes, can be fumigated inside a tent made of closely woven cotton sheeting, the porosity of which can be reduced by applying to it a linseed oil varnish. See Furniture Beetle.



Wrench. Fig. 1. Tap wrench. Fig. 2. Pipe wrench. Fig. 3. Monkey wrench, adjustable to nuts of all sizes. See article below

WORM In the Garden. Worms do good by aerating the soil of garden beds and borders, and their presence should be regarded as beneficial. On lawns, however, their casts are a nuisance, disfiguring the grass and giving it a dull, mottled appearance. They can be destroyed by purchasing a worm-killer powder from seed men.

WORMS In Human Beings. A great variety of worms infest human beings and domestic and other animals, as well as birds.

Intestinal worms are found in children more frequently than in adults, and especially in weakly children. Parasitic worms come from many sources, thus one species of tapeworm is swallowed in meaty pork.

For the prevention of worm infestation, people should avoid underdone or raw meat, water whose purity is doubtful, and raw vegetables, particularly watercress, unless beyond suspicion. Intestinal worms are got rid of by means of vermicide drugs, such as oil of male fern and santonium.

WORMWOOD. This is an attractive herbaceous plant—a small shrub which has fragrant foliage. It prefers light soil and a sunny place. The favourite kind is the southernwood or Old Man (*Artemisia abrotanum*), 2-3 ft. high, with grey, pinnate leaves and yellow flowers in summer; it is a common plant in cottage gardens. *Artemisia alba*—thunbergii—the wormwood and draught wormwood—looks like the tarragon. *Lactuca* is an excellent plant for the herbaceous border; it grows 4-5 ft. high and bears cream-white flowers in September. *Stellaria*, which has grey-white leaves and yellow flowers, is a trailing plant suitable for the rock garden.

Worsted. See Wool.

Wound. See Antiseptic; Bandage; Bleeding; Cut; Dressing; First Aid; Shock; Tourniquet.

WREATH. Funeral or commemorative wreaths are composed generally of natural flowers and foliage. Occasionally everlasting flowers are used, or a mixture of artificial flowers such as Flanders poppies with evergreens, or a wreath is carried out in porcelain. A special wire foundation is used in the making of floral wreaths. It is packed

with moss and the flowers are secured through this to the framework by means of stub wires which pierce the blossom.

A withered wreath may be renewed by removing flowers and moss, packing the framework with fresh moss over which trails of evergreens may be secured with fine red wire. On one side a bunch of flowers and foliage can be arranged. If flowers with firm stalks, such as daffodils, hyacinths, carnations, or chrysanthemums, are chosen stub wiring will not be needed. The bouquet can be

arranged and secured to the wreath with wire. Sometimes a bow of ribbon is used to finish off the wreath, or to add a touch of colour to a laurel or palm wreath. The latter are sometimes silvered with metallic paint.

An Easter commemorative wreath may be made on a stout wire ring, bound round with strips of green crepe paper to which palm leaves are wired. A trimming is provided by a bunch of flowering willow, birch, or twigs, and purple ribbon artistically arranged. Christmas wreaths or holly can be made in the same manner and completed by bunches of mistletoe and scarlet ribbon.

Wreath designs are popular in all forms of decorative art. Success depends on a sense of balance and colour. Wreaths are composed of every kind of artificial flower, leaves and many trunks, and are carried out in apples, leather, cloth, ribbon, fabric and woodwork.

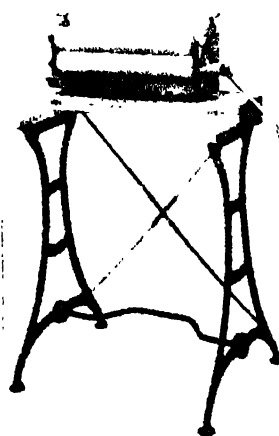
WRENCH. The form of lever known as a wrench is made in many patterns. The screw wrench or adjustable spanner is capable of turning a nut on a bolt varies in size from 8 in. to 18 in. and upwards, and so the handle entirely or stout or fitted with a wooden handle.

Pipe wrenches are made in several types, the simplest being similar to a flat spanner, but provided with a V-shaped opening with curved edges. For heavy work the form in

general use is composed of a stout handle with a curved and serrated end, to which is attached a movable clip of circular form. Similar wrenches are made for use with large tubing.

Tap wrenches for operating screw taps are generally provided with two square holes; the smaller sizes have holes differing by $\frac{1}{16}$ in., and the larger ones by $\frac{1}{8}$ in., and in some cases there are four holes varying in size. There is also an adjustable form in which a pinching screw is turned to close up the aperture and grip the shank of the tap in use. See Nut; Pipe Spanner; Stocks and Dies; also illus. above.

WRINGER. This is an instrument made for forcing water out of wet clothes during laundering operations. It is practically the same as the one known as the mangle, although, strictly speaking, there are slight differences between the two.



Wringer. Wringer with convertible table. The solid rubber rollers are 16 ins. by 2½ ins., and the pressure between the rollers is by simply-adjusted and dust-proof springs. All metal parts are of silicon aluminium and non-rusting. Overall height 28 ins., weight 45 lbs., table area 24 ins. by 14 ins.

Copyright, W. J. Harris & Co

The wringer proper does not roll out the garments or articles washed, as the mangle does. There are combined wringers and mangles obtainable, and also washing machines with wringers attached.

Rollers of rubber are desirable, one advantage of this material being that it is less likely than wood to break the buttons of the garments. A model of the type illustrated is easy to use for heavy washing, being perfectly rigid and at the same time constructed to deal gently with light articles. It is convertible into a table.

A smaller type of rubber wringer is manufactured which can be kept on a shelf. A patent reversible drain keeps all water from the floor, and the machine possesses an attachment which converts it into a table mangle. Special fittings are made for sink, draining board and bath. Large wringers, like mangles, can be driven electrically. This saving of labour is often economically justified where there is a great deal of home laundering.

A wringer, whether electrically or hand operated, not only saves time and labour, but also wrings out the moisture more effectively than could be done without its aid, and thus enables the clothes to dry more quickly. Wringers need no special care to keep them in good condition, but, to avoid straining the rollers, thick materials should be folded only once or twice before passing through. See Laundry; Mangle; Washer.



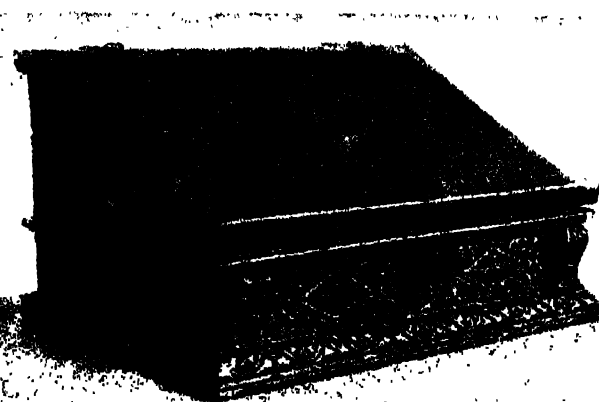
Writing Desk and Table. Fig. 1. Writing desk in carved oak, dating from the 17th century. Fig. 2. Beautiful Hepplewhite writing table in mahogany, with tambour top. Fig. 1, by permission of the Director, Victoria and Albert Museum, S. Kensington.

WRIST. The carpus, or wrist, connecting the hand and forearm, contains eight small bones, called the carpal bones, which above form joints with the lower ends of the two forearm bones, the radius and ulna, and below with the five metacarpal bones. The wrist joint is capable of a wide range of movement, and from its position and structure is very liable to sprains. In Colles fracture (q.v.) the whole wrist is more or less dislocated backward.

Dropped Wrist. Loss of power in the muscles at the back of the forearm is the cause of dropped wrist: it may follow any injury to the musculospiral nerve which supplies the muscles. It may also be due to the pressure of the head of a crutch. Treatment is by support, massage, electricity, etc.

WRITING DESK AND TABLE. The name writing desk is employed sometimes as if synonymous with writing table. The differences between the two, although these are now somewhat obliterated, are that the desk is a sloping piece of furniture, while the table is not, and that the desk is also a receptacle.

The early writing desk was just a plain piece of carpentry made to slope towards the writer and to stand on the top of a table. It was therefore portable, but lost this advantage when someone formed the idea of fitting legs to it and so making it the writing desk of modern times. The space beneath the top



was utilized as a receptacle for papers, and the desk was also a box; the expression desk box was sometimes used.

In time desks became more elaborate, and some are one examples of the cabinet maker's art. A beautiful specimen of what may be called the writing desk proper is illustrated in Fig. 1. Made of oak early in the 17th century, it is notable for its magnificent carving.

Tables specially designed for writing have been made for centuries in the form of an ordinary table of medium size with drawers or additions for requisites.

The first writing tables had a drawer or two in the underframing, and the tops were covered with a coarsely woven cloth known as *bure* in France. This was something like a baize and was at first blue in colour but afterwards green. From the word *bure* developed the word bureau. Morocco was employed for covering the tops of writing tables in the 17th century. Beautiful knee-hole tables were made of

drawers, but actually open as enboards.

Writing tables of the pedestal type were made by Chippendale. Sometimes their angles were rounded and occasionally they had serpentine fronts. In elaborate examples engaged columns are seen at the angles. Hepplewhite made writing tables on the lines of the roll-top desk. An example of his work is illustrated in Fig. 2, notable both for the elegance of its line and its compact

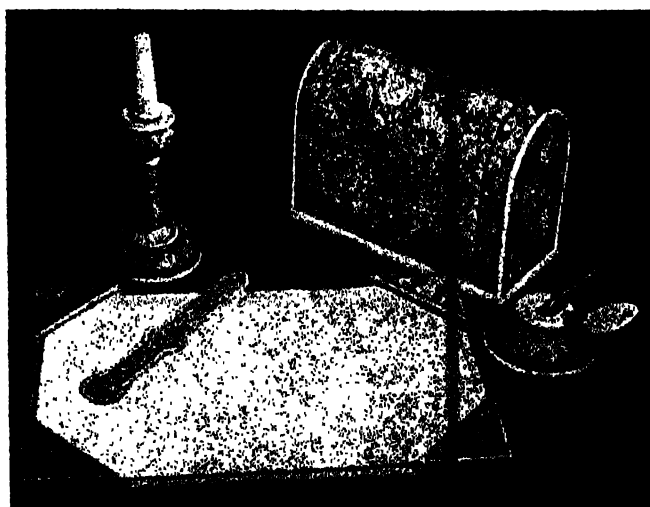
usefulness. Known as tambour writing tables, these were fitted with a sliding shutter to slip down when the article was out of use. Inlaid satinwood was much used for small writing tables of this period, some of these being made with folding tops and fitted with drawers underneath, while others are circular with a hinged drawer that swings out and contains writing materials.

Tambour writing tables continued to be in fashion during the Regency period, made in rosewood with ormolu mounts. Other early 19th century tables were also of rosewood, with bronzed legs and leather tops, sometimes brass rimmed and with mouldings of gilt wood.

To-day good writing tables are leather topped and made of mahogany, walnut, or a more weathered oak, and lacquered woods. Some are decorated with carving, while others have cross-banded fronts. Convenient sizes are 3 ft. and 4 ft. long. See Bureau, Davenport Table; Study.

WRITING DESK SET. Accessories for the writing desk or table are more likely to add a decorative finishing touch to a room when chosen as a set than when selected as odd pieces without relation to each other or to their surroundings. Sets may be comprised of a blotter, inkstand, pen tray and notepaper rack, or they may also include one or a pair of candlesticks, paper-weight, ash tray and waste paper basket. If the telephone stands on the desk a screen and pad might be added. Sometimes there is a combined fountain pen stand and ash tray.

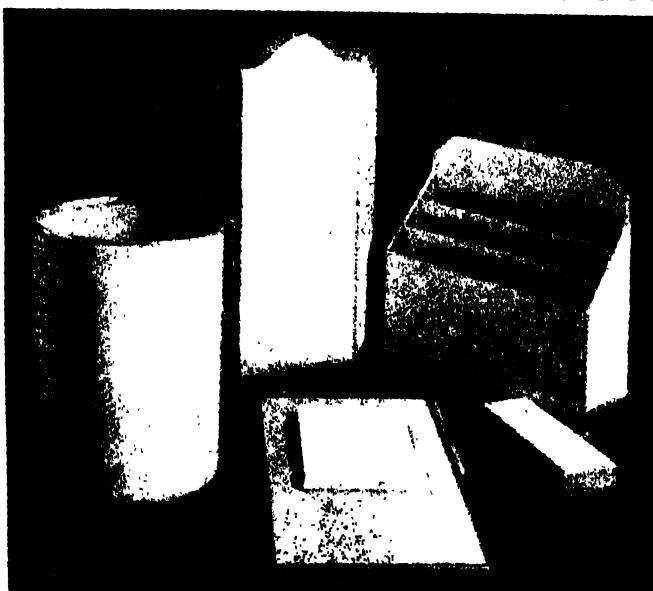
The various types of writing table will suggest certain styles of accessories. Coloured glass, in an amber or green shade, looks particularly well on a walnut or mahogany table, for such details as pen and ash trays, candle-



Writing Desk Set. Fig. 1. Set decorated in modern lacquer work, adapted from an old Indian design in Delamater colouring.

sticks and inkstands in combination with lacquered wood for the stationery rack and blotter cover. Gesso and barbois work on gilded or silvered whitewood articles would be most attractive in a prettily furnished sitting-room, while leather in a bright or rich colour would be suitable for most of the articles on a man's desk, with attractive ash tray and ink or pen stand in modern style of marble or in metal.

A whitewood set painted in soft colouring, and adapting an old Cashmere design, is illustrated in Fig. 1, and executed in poster colours on a brush lacquer foundation. Fig. 2 shows a group of inexpensive accessories covered in imitation parchment which can be bought ready for painting or ornamenting by means of coloured prints, which can be bought covered with imitation parchment and decorated with coloured prints, with stencilled designs, or by painting them with waterproof inks, which can be bought cheaply and used as described for parchment shades in the article on Lampshade. When decorated the accessories should be varnished with clear white varnish. If these



Writing Desk Set. Fig. 2. Inexpensive accessories covered in imitation parchment which can be bought ready for painting or ornamenting by means of coloured prints

imitation parchment articles seem too greasy to be easily painted, this can be remedied by rubbing the surface with tissue paper and also by stroking the paintbrush lightly on a piece of damp yellow soap before dipping the brush into the ink. See Gesso, Lacquer Work; Lampshade; Leather; Stencilling; Waste Paper Basket.

WROUGHT IRON WORK

The Making of Articles both Decorative and Useful

Other metal working processes are dealt with in our work under the headings Metal Work, Silver Work; Engraving. See further the entries on the associated processes employed, e.g. Brazing; Doping; Fixing; Soldering.

The manipulation of iron in bar and sheet to make objects of utility and beauty has been superseded by cast iron and machine presswork to a considerable degree. Generally wrought iron work requires the provision of a forge and an anvil as well as a vice, together with suitable hammers, tongs, pliers, and other tools belonging to the metal-worker. A portable forge and a small anvil are not too expensive for the amateur, and other tools can be added as required.

The particular processes in the manipulation and treatment of wrought iron are forging, welding, flattening, upsetting, bending, embossing, unpressing, and punching. Forging is done when the iron is heated to a bright red. Welding consists in forging two separate pieces into one when the iron is at white heat. The parts to be joined are cleaned and sprinkled with borax or sal-ammoniac to prevent oxidation. The striking should be light at first and gradually heavier. Flattening consists of lengthening or widening a piece of bar. This is done with the narrow edge of the hammer and the grooves so wrought are smoothed out with the large end.

Upsetting consists of thickening the bar and is the opposite of flattening. The method is to strike the red-hot iron on the anvil or to hammer the end. Bending can be done cold as well as when the metal is hot; right-angle bends are done over the edge of the anvil or the square part of the beak, while curves are done on the round end of the beak or on a conical mandrel or stake fitted in the vice. Embossing is the process of making bosses by hammering the hot metal into suitable cavities or by using a ball-faced hammer on a piece of hardwood when the metal is cold. Impressing is a means

of arriving at similar shapes by pressure either with the vice or a press. Punching is used for marking points, or drilling and cutting as well as for providing decoration.

Welding and Brazing. There are several methods of joining ironwork, welding being the principal and most generally used in large work, but brazing can be carried out with material of small size. Riveting is necessary in places where welding is not practicable.

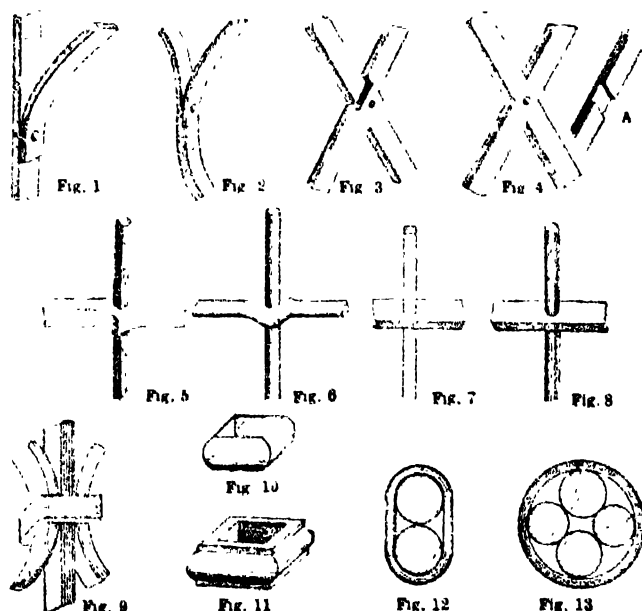
There are various ways of joining with rivets, the simplest being where two pieces are to be attached, as at Fig. 1. In dealing with curves, another method of riveting is shown at Fig. 2, and consists of cutting away sufficient material to allow the second piece to fit flush. Intersections of bars are carried out as shown at Fig. 3, in this case the top piece is shaped, while hot, between two projecting blocks. A neat method of intersecting is shown at Fig. 4, and consists of filing out half the thickness of each piece, as at A, so that they may fit flush.

The methods followed in passing one bar through another are shown at Figs. 5, 6, 7, and 8. In the first two the metal is punched and widened out each side; in the latter examples the hole is drilled and filed to take the bar. When several lengths of bar are to be held, the method used (Fig. 9) consists of forming a collar to bind them together. The collar can be of flat bar or half-round, as at Fig. 10; a combination of the two, shown at Fig. 11, is effected by placing a collar of half round bar on a wider flat collar. Round bars are held together with a collar, as at Figs. 12 and 13.

Straight bar can be decorated by simple means by using a file and a punch, as at Fig. 14. An elaboration is shown at Fig. 15. Another method suitable for square bar is shown at Fig. 16; the angle cuts are made with a three-cornered file and the curves with a half-round file. Simple twists (Fig. 17) can be done while the metal is red hot, by placing one end in the vice and turning it with the tongs. Square bar can also be twisted, but it is heavier work and requires the help of a screw wrench. Slitting and opening out, as at Fig. 18, is effective. The simplest method is to cut the rod to the centre from three sides, upset it to open out, and then twist. It is, however, a difficult operation for the beginner. Interlockings are fairly simple, as at Fig. 19, but in Fig. 20 the main rod is split and opened out with the ends forged to a knob form.

The spear shape at Fig. 21 is indicative of flattening and welding in the case of the side pieces, otherwise the lower portion would require considerable cutting away. This form of treatment is used with square bar in railings and similar work, and it can be worked out in many different forms. The formation of the volute, at Fig. 22, is termed scrolling, and is one of the main effects obtainable in wrought iron work. It can be done cold or while the metal is hot, either on the anvil or (usually) with a scroll wrench or round a scrolling iron, which enables an even curve to be formed. These are obtainable in several shapes and sizes. The end of the volute can be flattened, as at Fig. 23, or the widened end can be slit and formed into separate volutes, as at Fig. 24.

A simple piece of work for the beginner in scrolling is shown at Fig. 25, and consists of a stand for a hot plate, flat iron, or teapot. It



Wrought Iron Work. Figs. 1 and 2. Two simple rivet joints. Figs. 3 and 4. Methods of intersecting. Figs. 5-8. Methods of passing one bar through another. Fig. 9. Forming a collar to bind several lengths together. Fig. 10. Collar of half-round bar. Fig. 11. Another method of forming a collar. Figs. 12 and 13. Round bars held together by collar.



Fig. 14



Fig. 18



Fig. 15



Fig. 17

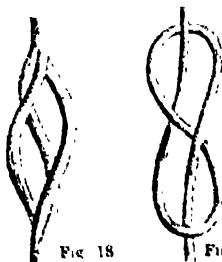


Fig. 18



Fig. 19

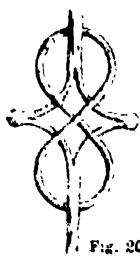


Fig. 20



Fig. 21

is formed with a circular ring which is bent and the ends welded to form it even length, and then the interior pieces are shaped and fitted in the form of three separate pieces, and then riveted with two rivets, or one length can be welded on to each end of the centre piece.

An example of welding in the formation of several scrolls is shown at Fig. 26, and although it is sometimes possible to do the welding after the scrolls have been formed it is found to weld much better if the scrolls are welded together first, and then form the ends to the required shapes.

An example of welding intersecting, and riveting is shown in Fig. 27 in the form of a portion of a grill. The grill is made as shown, as possible, and the use of the design of a grill should be to fill the space decoratively, possible without riveting. Spacing should be such that the rivets are not too close, and the riveted part just such as to hold the work together.

As a rule, wrought iron designs should be highly conventional, and suggest strength. A good finish for wrought iron is to heat the metal and then rub or brush with a black brush, or a black brush can be obtained by covering thoroughly with linseed oil and burning it off over a fire.

WYANDOTTE.

Amongst exhibitors of poultry the Wyandotte is without doubt the most popular of all the American breeds. There are 13 varieties, namely, white, black, blue, buff, Columbian, blue laced, buff laced, black laced, gold laced, silver laced, pullet silver penciled and partridge. Favourites are the white, black, silver laced, gold laced, and Columbian.

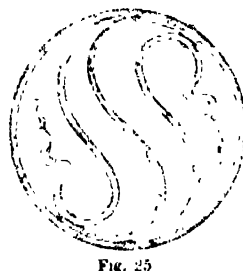


Fig. 25

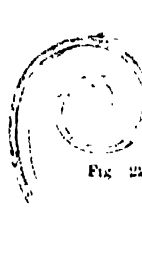


Fig. 22

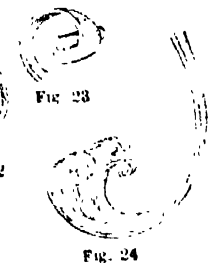


Fig. 23



Fig. 24

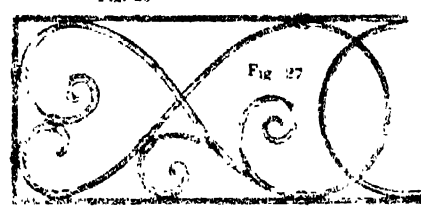


Fig. 27



Fig. 26

Wrought Iron Work. Figs. 14, 18, Ornamentation on straight bars. Fig. 17, Simple twist. Figs. 18, 20, Decorative forms of slitting and opening out. Fig. 21, Spear design. Fig. 22, How to form a volute. Fig. 23, End flattened. Fig. 24, End via. Fig. 25, Taper stand. Fig. 26, Use of welding in formation of scrolls. Fig. 27, Example of welding, intersecting, and riveting.

red combs, faces, wattles, and lobes. They are all rose combed. See Fowl, Poultry.

XERANTHEMUM. This is the name of an annual everlasting flower or minor tree which is useful for indoor decoration in winter. It is grown from seeds sown out of doors in spring. On this flower the chrysanthemum is named. It is in high, of which there are several varieties.



Wyandotte. Pullet of the white variety of this American breed.

Among many utility breeders the white and the Columbian are the most extensively bred, and as winners of laying competitions no heavy breed has won more distinction than these.

On the average cocks weigh 7 lb. to 8½ lb., hens 5 lb. to 7 lb. The partridge, white, and Columbian are the heaviest, the laced the lightest. The whites are the best layers, as far as numbers of eggs are concerned, the gold-laced being the poorest. The eggs average about 2 oz. in weight and are brown shelled. All the birds have yellow legs.

The rays pass more easily through flesh than bone, and through bone than metal. Hence an X-ray photograph will show a bullet or other piece of metal more distinctly than bone, and a bone more distinctly than the surrounding flesh. What is shown on a photograph is not the actual object or tissue, but the shadows of these thrown on the photographic plate. The interpretation of these photographs requires special skill.

X-rays are short waves of light which are produced when an electric current is passed through a vacuum tube. The air in these tubes, which are usually made of glass, is not absolutely exhausted, but it has been diminished to a very great degree. This varies in different tubes. Soft rays are produced in a tube with a low vacuum, and hard rays in one with a high vacuum. The soft rays are not so penetrating, and are largely absorbed by the skin. Hence they are used for treatment of superficial affections. The hard rays are more deeply penetrating, and are employed for deep seated diseases.

On the cells of the body the rays have a stimulating effect which becomes irritating and destructive when the application is prolonged. The theory of their action is as follows: All living cells can be destroyed by very good stimulation, but abnormal or diseased cells are more easily destroyed than normal healthy cells. If, therefore, the X-rays are applied with the highest intensity compatible with safety to normal cells, they destroy the abnormal cells of diseased parts.

A large number of affections are successfully treated by X-rays. These include ringworm, favus, phages of eczema, psoriasis, leprosy, and other skin diseases. Graves' disease, tuberculous glands and other instances of superficial tubercles, rodent ulcer, naevi, forms of leukaemia, and other troubles. With regard to cancer, apart from rodent ulcer, X-rays should not be used if an operation is possible, but when it is too late for a successful operation they often give great relief.

In tuberculous diseases X-ray examination is extensively used both for detection of early cases and to note the progress of patients under treatment. The development of mass radiography, the pictures being taken on 35 mm. strip film, has made possible the examination of large numbers of persons, without their undergoing, in a short time.

Over exposure to X-rays may cause burns and also symptoms of general bodily disturbance, such as vomiting and giddiness.

XYLONITE. A manufactured form of celluloid, xylonite is made in various colours and in imitation of ivory, tortoiseshell, etc. It is manufactured in sheets of various thicknesses and can be used for many purposes. Owing to its inflammable nature it should never be placed near a flame nor exposed to heat. See Celluloid.

YACHT: How to Make. The design of a model sailing yacht must follow certain definite rules, too numerous to include in this short description, but they are followed in the design shown in the side elevation at Fig. 1. The hull is shaped from a 36 in. by 9 in. by 3½ in. block of sound well-seasoned wood planed to the dimensions given, yellow pine, spruce, or cedar being suitable.

The first thing to do is to prepare templates of the sections indicated by the lines on the deck plan at Fig. 2, the section at Fig. 3, and the section lines at Fig. 4, the latter being drawn out full size, together with the sheer plan outlined at Fig. 1, and deck plan at Fig. 2. The templates can be of stiff paper, as at Fig. 5, and represent the shape of the hull at intervals of 6 in., being marked B, C, D, E, and F. In order to hold the wood securely in the vice a 2 in. by 2 in. by

X-RAY. The Röntgen rays, also called X-rays, have very important uses in diagnosis, and also in the cure or relief of certain diseases. For the purpose of diagnosis, they are employed to reveal the presence and situation of bullets and other foreign bodies, the presence of stone in the bladder, ureters, or the kidneys, for fractures, dislocations, lung and heart diseases, tumours, etc. The investigation of stomach and bowel disorders is assisted by giving the patient a barium or bismuth meal.

12 in. block should be screwed to the top so that the jaws of the vice can grip it and allow the whole of the hull to be worked. The plane, spokeshave, and chisel should be used to cut away the waste, and great care must be taken to fit the templates at the correct places, as shown.

The surface, when correctly shaped, must be thoroughly smoothed, first with a scraper and finally with glass paper. The most suitable wood for the keel is beech, it should be prepared to the shape shown from $\frac{1}{2}$ in. board with a length of 25 in. and a depth of $6\frac{1}{2}$ in. The lower edges are rounded off to a sharp edge except the portion at the bottom which is covered with lead. A horizontal groove is now cut along the centre of the hull to a centre depth of $1\frac{1}{2}$ in., so that the keel will fit tightly and can be glued in position. The top is now curved with a drop of $\frac{1}{2}$ in. in the centre and the inside of the hull is removed, by boring a number of holes with a large centre bit and then using one or two sizes of firmer gouges, the sides should be left to a thickness of $\frac{1}{4}$ in. until the inside is neatly shaped, and in order not to cut down too deep, three or four inside templates should be used. The greatest thickness at the bottom should be $1\frac{1}{2}$ in. to allow for the depth of the groove. In any case, this should not be less than $1\frac{1}{2}$ in.

When the shaping is finished, a $\frac{1}{2}$ in. line should be gauged from the top and a $\frac{1}{4}$ in. line from the outside to enable the rebate to be cut for the deck, the latter being shaped from $\frac{1}{4}$ in. wood. The keel is now further secured with screws driven in from the inside of the hull and the two lead weights made and screwed to the bottom of the keel. The easiest way of providing the pieces of lead is to model the shape with a piece of Plastiline and make a plaster of Paris mould; two separate castings can be made and fastened to the sides of the keel to form a bulb.

An alternative method is to cut the bulb with a groove in the top so that the planed off keel can be fitted and the lead attached with screws driven in from the bottom. The approximate weight of the lead should be 11 lb.

The hull should be painted inside and out with several coats of good oil paint, rubbing down the outside coats and finishing with enamel or varnish. The spars should be made from a close and straight grained wood, and generally pitch pine is used. The mast is 58 in. long, $\frac{3}{4}$ in. diameter at deck level, squared at the bottom to $\frac{1}{2}$ in. and tapered to $\frac{1}{4}$ in. at the top. The surface should be carefully finished and

made perfectly smooth. A block of wood is placed inside for the heel of the mast to fit in, and a hole bored in the deck and surrounded on both sides as at H with a 2 in. by $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. strip of wood.

The centre of the hole in the deck should be 13 in. from the bow of the boat; the centre of the hole in the block inside should be stepped back to allow a rake of 2 in. in all. However tightly the mast is fitted through the deck it is hardly possible to keep the inside quite watertight; it is therefore necessary to fit a brass screw cap, as used in gas fitting, at the stern as at K, so that any accumulation of water can be emptied out.

A shallow deck house, composed of a $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $1\frac{1}{2}$ in. and a $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. piece of wood glued together, is secured to the deck as shown at L in Figs 1 and 2. Cleats measuring $2\frac{1}{2}$ in. long and made from $\frac{1}{2}$ in. by $\frac{1}{2}$ in. wood are fastened on as at M, N, and P, but the thickness of the deck is increased by $\frac{1}{2}$ in. at the bow by a shaped piece glued and nailed to it. The deck can now be attached to the hull and the remaining spars and rigging completed. The bowsprit is 13 in. long, tapering from $\frac{1}{2}$ in. to $\frac{1}{4}$ in., and secured to the deck by fitting the heel in a screw eye and lashing wire round it and fastening to a small screw eye at Q. The boom is 26 in. by $\frac{1}{2}$ in. diameter and is attached to the mast by two screw eyes.

The mainsheet is secured to the end, run

through a block attached as at R, with a closed S hook to a horse made of wire, and through another block as at S, and then through a screw eye in front of the horse direct to the cleat at M. The mainsail measures 25 in. at the foot, 31 in. along the leech, 18 in. at the head, and 18 in. along the luff. Three brass rings are slipped on the mast and the sail is then sewn to them.

The gaff is shaped to $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by 20 in. It is provided with small screw eyes, one at the throat, another 8 in., and another 6 in. further on. It is held in position as shown at Fig. 1, the screw eye at T being 21 in. up the mast and those at U being 2 in. above. The lines securing the gaff are threaded through the zell side at U and T and carried through the first of three small eyes at V, and secured to the cleats at P and N respectively. The topsail measures 30 in. by 24 in. by 15 in., it is secured to an eye at the top of the mast, to a ring 11 in. down and by a line to an eye situated close by the mast on deck and also to the head of the gaff.

The jib is 25 in. along the luff, 21 in. along the leech, and 13 in. along the foot, with the girth 14 in. by $\frac{1}{2}$ in. diameter, the latter being secured to a wire horse 10 in. from the bow. Sheets should be attached to the mast from a point just above U and fastened to the eyes at V₁ and V₂. The jib is fastened to a line secured to the bowsprit, threaded through the eye at U, carried through V₁ on the opposite side and fastened to the cleat at N. The bowsprit is stiffened by the line running to N, and also by two lines secured to rings at W. All spars should be finished with a polished surface, shellac varnish being suitable for the purpose.

The yacht has a fixed rudder and does not require anything else; all necessary movements can be made by the adjustment of the sails. It will be found that the free movements of the booms on the wire horses will provide for sailing motion.

Sails should not be folded up when wet, but should be spread out flat and thoroughly dried. Always remove water from the fold and keep the cap, or hatch, uncovered when the yacht is not being used. It is advisable to have a spare set of spars, and the wise yachtsman will carry a length of cord, some wire, and a pair of pliers, so that repairs can be carried out on the spot when urgent.

When setting the rigging it is important not to draw cords too tight, because if they become wet they will shrink and might snap. The ring hooks securing the mainsail to the mast should not fit tightly; the mast tends to swell when wet, and if the rings are tight it may be difficult to raise or lower sail.

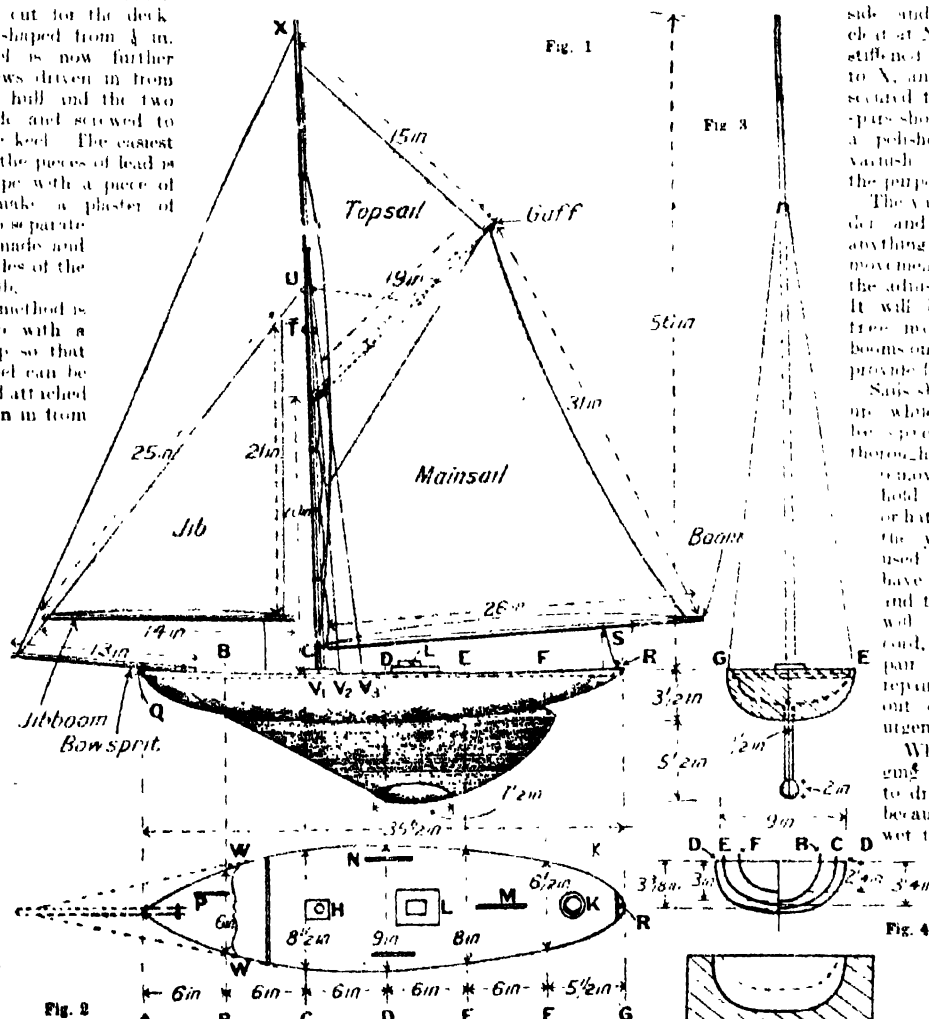


Fig. 2

Yacht. Fig. 1. Side elevation of a model sailing yacht, which can be made by the amateur by following the instructions given in the text. Fig. 2. Plan of deck. Fig. 3. Sectional view of yacht. Fig. 4. Section lines of hull at 6-in. intervals. Fig. 5. Template of hull section, which can be made from stiff paper.

YARD : The Measure. The yard is the standard English measure of length. A yard is divided into 3 ft or 36 in. A square yard contains 9 square feet and a cubic yard contains 27 cubic feet. There are 220 yards in a furlong and 1,760 in a mile. 4,840 square yards make an acre.

YEAST Yeast is a plant of the fungus order which is formed in fermenting liquids and plays an important part in brewing and also in baking. Fermentation takes place when yeast is added to sugar, alcohol and carbonic acid gas being given off. Yeast is added to dough in baking in order to make the bread light and porous, the gas causing it to swell up into the consistency of a sponge. A tepid liquid must be used as yeast is inactive when dry and cold, while too great heat kills it.

Yeast has various uses in medicine. It is sometimes given to patients suffering from boils, acne or tuberculosis as it appears to increase the number of white corpuscles in the blood. The dose is about 2 to 5 centigrams in a little milk once or twice a day. Yeast cells are rich in anti-neuritic vitamin as are also extracts of yeast. The latter resemble meat extract in their properties and are used in diet.

Yeast Cake This cake is made with 3 lb flour, 4 oz each hard margarine, dried currants and sultanas, 4 oz moist sugar, 2 oz chopped lemon peel, 1 pint each of milk and water, 1/2 oz yeast, a little brown sugar and a pinch of salt. Put the flour into a basin, add the salt, and rub in the lard and margarine. Put in the fruit, sugar and peel, mix the yeast with a little warm water and brown sugar, pour this into the centre of the mixture and leave it for 10 min. Then pour in the milk and water and beat all well together. Put it in a warm place to rise for 2 hours and then bake it in a hot oven.

YEW This is a most valuable evergreen suitable for planting as specimen trees in the lawn and for covering walks. It bears clipping well. It flourishes in cold, dry soil but is not waterlogged. The common yew, *Taxus baccata*, lives to a great age, 1,000 years or more. The branches in old yews, especially when withered, are poisonous to man.

Yew is largely planted as a hedge, though it grows badly for the first few years. The Irish yew, *Taxus baccata fastigiata*, is a popular evergreen tree. It is upright, conical in habit and with well-defined plant. It follows the variety *aurea* has golden yellow leaves. The yew named *Duroni* is a graceful drooping growth. The best time to transplant yew trees is in May or September.

Yew trees ought to be clipped early in May and again in August. If an old overgrown hedge has to be cut back the work should be done in April.

Uses of the Wood. This wood is very hard and lasting. Susceptible of a high polish, it is most profitable. It is not greatly used for furniture, today, but is sometimes employed for marquetry. See Hedge Topiary.

YOGHOURT. Curdled milk has long been largely used in the diet of many countries in south-eastern Europe. The best known preparation



Yorkshire Terrier. Champion of this long and silky-haired breed of toy dog.

is Bulgarian yoghurt or yohourth in which the souring is produced by the bacillus named *bacillus Bulgaricus*. Metchnikoff suggested the use of the ferment of disease, the acid Bulgarian bacillus lessening intestinal putrefaction. Since its introduction this method of treatment has attained high popularity, and it has been recommended in cases of chronic ill health without obvious cause, neurasthenia, and certain intestinal affections such as colitis, diarrhoea and constipation. See Sour Milk.

YORKSHIRE PUDDING There are several methods of preparing this batter which is a usual accompaniment of hot roast beef. The tin or dish must be prepared by rubbing it with plenty of good dripping which should be well heated before the batter is poured into it. Before cooking the pudding should be rolled out and put into neat pieces and arranged in a hot dish. For an economical Yorkshire pudding use 1 lb flour with 4 teaspoonful salt into a basin, mix well in the centre and break in two eggs. Beat these with a portion of flour till light then add by degrees 1 pint milk and water beating all the while. Let the batter stand 1 hour then pour it into a hot tin and grease the tin. It should be baked 30 or 40 minutes.

Occasionally the pudding is cooked in the same tin in which a joint is being baked. If so the meat must be raised on a trivet and the batter should not be poured in until the meat has been partly cooked. The objection to this method is that much of the gravy and dripping, which it is absorbed by the batter. A portion of dripping may be poured off before the batter is put in. See Batter.

YORKSHIRE TERRIER

This is the name of a pretty little toy dog. It possesses a vigorous and well-proportioned body and carries its completely hidden beneath the close, straight coats of silky hair that fall from the parting along the middle of the back to the ground on either side. The coat should be uniformly of a bright steel blue without a fawn or tan hair, but the long and abundant hair on the head, ears and under the chin should be tan. The nose should be perfectly black. See Dog, Terrier.

YUCCA. This is an evergreen shrub of striking appearance with long leaves and upright panicles of white or cream white flowers. They like well-drained soil and are propagated by offsets in spring. These are taken off the old plants, potted, and kept in

a frame until rooted. *Yucca gloriosa* is grown as well as in country gardens. The favourite kind is Adam's needle (*yucca gloriosa*), which has stiff leaves and an immense spike of bloom.

ZEPHYR CLOTH. Zephyr cloth is a cotton fabric somewhat resembling gingham in texture, and of light or medium weight. It usually contains two or more colours, woven in a variety of pattern.

ZINC. A bluish white metal, zinc is harder than aluminium and softer than silver, stronger than lead or tin, and has a brassy lustre when polished. Being malleable it can be hammered and rolled into thin sheets. Commercial zinc, which is called spelter, is brittle but it is malleable when heated to a temperature between 100° C. and 150° C., when it is heated above that temperature again becomes brittle.

Zinc is scarcely affected by dry air, in dry air the exposed surface is converted into a carbonate of zinc, owing to the presence of carbonic acid gas, and this effectively prevents any further change. On account of its malleability zinc is employed for roofing and also for tanks. It is used to a much greater extent in galvanising iron and steel. The metal is cleaned with acid to remove scale, and is dipped into the molten zinc. The result is to protect the iron, which is quickly oxidized by exposure to air and water and provides a rustless surface. See Boat, Dutch Metal, German Silver, Leo Sile, Ormolu, Soldering.

Medicinal Uses. Numerous compounds of zinc are used in medicine. Zinc chloride is a powerful caustic, and at one time was commonly used as an antiseptic. The acetate, carbonate, oxide and sulphate of zinc all act as astringents when applied to raw or ulcerated surfaces and are therefore often of value in solution as astringent lotions. See Zinc, Zinc.

remedy for one form of conjunctivitis.

Powdered oxide of zinc and powdered carbonate of zinc are commonly used as dusting powders where a mild astringent effect is required. Calamine ointment, much used in skin diseases, is made with native zinc carbonate, otherwise known as calamine. Internally zinc sulphate is a prompt and valuable emetic in certain cases of poisoning.

ZINNIA. The zinnia is a half hardy annual bearing flowers of rich colour, some of double form, including crimson, scarlet, bronze, white, buff, violet, and mauve. The plant is prolific and long-lasting but demands all the sunshine possible and well-enriched soil. Seed should be sown in heat in March, transplanting seedlings once or twice to make good stocky plants.

ZITHER. As a stringed instrument the zither stands in a class by itself, for the strings are plucked both with the fingers and with a plectrum. It consists of a wooden body, about 1 ft 8 in long, 10 in



Zinnia. Gaily coloured blossoms.

wide, and 3 in deep, which, when played is placed upon a table. Upon the side farthest from the performer the body has a very pronounced bulge beyond the strings, the object being to increase the resonance of the instrument. In the upper table of the body there is a large, circular sound-hole. The 30 strings, which run from left to right, fall into three distinct classes, namely, the melody, the accompaniment, and the bass strings.



Yucca. Beautiful flower spikes of this decorative plant.

